room space heating. The City's calculations of the company's anticipated average electric space heating for usage per RH customer is therefore overstated. The extent of this error, which carries through virtually all of the City's residential heating analysis, is a 17% error for 1979 for electric space heating consumption of Rate RH units a 10% error for new construction projections through 1989, and a 54% error in calculated average usage of conversion and existing units. Correction of these errors eliminates the City's 188 gWh and 197 gWh adjustments as proposed on pages 11 and 12 of City Exhibit One (PECO Statement No. 3A, p. 18; Tr. 1727-29). According to the company once these two misunderstandings are corrected, the company is forecasting greater conservation levels in virtually all residential sectors than is the City in making its conservation adjustments.

PECO also criticizes the City's commercial conservation program. It claims that for the toal usage of new commercial buildings, the City's witnesses have assumed extremely low usage characteristics based upon certain draft studies, which the authors of those studies explicitly state are preliminary and not for citation, of partial kwh usage. As stated in these studies, the usage figures employed by the City in their adjustment do not include electricity consumption for all functions in the buildings, which the studies acknowledge is perhaps the majority of total building consumption. (PECO Statement No. 3A, pp. 21-22; PECO Ex. 5). Moreover, the usage figures are not based upon any experienced electric usage data, but rather reflect design estimates. As pointed out by Mr. Hoch, data collected from the PECO service territory establishes much higher total usage levels (PECO Statement No. 3A, pp 26-27).

The City assumes that conservation by existing large commercial customers will reduce consumption by 1,259 gWh over the next ten years, which is an additional 15% conservation over the amount which has already been conserved since 1973.

PECO, in its 1980 Forecast, has estimated an additional 550 gWh in this market over the 15% conservation which took place since 1973. This, it states is the maximum amount of conservation which can be obtained without engineering and cost analysis studies that would eventually lead to major capital expenditures.

I agree with the company that it is not reasonable to expect such major capital expenditures to be made. In the small commercial buildings much of the space is leased, and tenants are naturally reluctant to invest in major capital improvements in the building. Since in most cases the tenants, rather than the owners, pay the electric bills, it leads to the conclusion that the City's estimate of additional conservation of by existing commercial customers may be overstated.

The City's proposed industrial conservation adjustment is unsupported by any specific data (City Exh. 1, pp. 37-38; PECO Statement No. 3A, p. 31). The City's program also relies on industrial cogeneration, waste to fuel facilities and voltage reduction as substitutes for new capacity from Limerick. The costs of such projects, however, would appear to be prohibitive and, as a practical matter, such options cannot be relied upon to replace Limerick. For example, a typical 30 MW cogeneration facility costs approximately $100 million while a 76 MW trash burning facility would cost about $150 million. On this basis, the total capital cost in current dollars of the City's waste-to-fuel and cogeneration programs would be over $700 million (PECO Statement No. 2A,

p. 5). Given the present financial posture of the City of Philadelphia it is doubtful that much monetary assistance would be coming from that source, as the City witnesses appear to suggest (City Statement No. 1, p. 14).

Voltage reductions would cause PECO to incur greater capital costs than assumed by the City since its circuits at the present time do not have the individual controls needed to implement such a program. In addition voltage reduction is a questionable technique as a continuing strategy for load reduction (PECO Statement No. 2B, pp. 7-8).

The City, it should be noted, claims that the numerous criticisms of its program are "unsubstantiated" and have a quantitative effect of but 45 gWh. The latter statement is unexplained and seems contrary to the record (PECO Statement No. 3A, pp. 17-34; PECO Statement No. 15, pp. 43-49; PECO Statement No. 2B, pp. 1-8; PECO Statement No. 2C, pp. 1-5). It should also be noted that the City's witnesses failed to respond the company's specific criticisms during the hearing.

In addition to the severe problems shown above in quantifying the conservation savings, problems which to my mind would disqualify this analysis from further consideration, there is also considerable problems with the City's attempt to measure the relative costs of Limerick completion and alternatives.

First, the City's analysis is limited to 1989, while the estimated life of Limerick is approximately 35 years. The City's method then considers only 5 years' fuel savings for Limerick Unit I and only 3 years' savings for Limerick Unit II. It compares these limited savings to the total remaining (non-sunk) capital costs. As PECO witness Kasum

noted, if the City's study period is extended for 5 more years, completion of both units becomes the economic choice (PECO Statement No. 2B, pp. 3).

Finally the conservation program itself, in those areas which are described in sufficient detail, fails to consider potential institutional barriers to implementation of such proposals. Given this uncertainty, it would hardly be prudent to delay construction of Limerick Unit II, with its obvious financial implications, while a possible conservation plan is explored. One need only remember that it took this Commission from April 6, 1978 to March 28, 1980 to decide on the lawfulness of Pennsylvania Power & Light's insulation standards for new housing (R-78040578) to see that these matters are typically the subject of extensive investigation and litigation. Similarly, by order entered December 8, 1981 at R-811488, UGI-Corporation Gas Division, this Commission stated its intention to institute a generic rulemaking proceeding to consider the issue of insulation standards for existing housing. In an order entered October 9, 1981 at the same docket, the Commission indicated that determination of our jurisdiction in this area should be of paramount importance in any investigation on insulation standards. It would seem, therefore, that, contrary to the assumptions of the City, this Commission is not about to issue such standards by administrative fiat.

There are also many questions raised as the authority of PECO or this Commission to enter into home insulation and low interest financing programs. On the basis of actions taken by other states to grant utilities and their regulatory commissions specific authority to provide these services, it would appear that there is at least some basis for

the position that without specific enabling legislation, such a mandated program by this Commission would be subject to extensive litigation, thereby making the timing and amount of any such energy savings highly speculated.

This similar issue was presented to the New York Public Service Commission in Long Island Lighting Company (Opinion No. 81-9, issued May 26, 1981) where that Commission considered the claim of the Shoreham Opponents Coalition (SOC) that the Shoreham Nuclear Generating Facility being constructed by that utility should be halted and a conservation plan instituted to replace it:

> Third, SOC claims that the prudent course for us to follow is not to endorse Shoreham further, as Judge Levy recommends, but to give "serious and immediate attention" to the conservation alternative, which, it says, would double our planning options by departing from an exclusive commitment of the ratepayers "to the runaway costs of an ill-conceived project." This argument, too, misses the point. The Judge's recommendations--which we here adopt--do not per se reject the conservation plan proposed; they simply reject the proposal as a preclusive alternative to Shoreham. But by further considering these and other conservation measures independently of the question of Shoreham's completion, as the Judge recommends, we thus retain conservation concepts within our "planning options."
>
> Finally, CEP objects to Judge Levy's misgivings regarding the lack of specificity with which the conservation proposal was presented. The proposal was never intended, it says, to serve as a detailed blueprint for a conservation program. Moreover, if such specificity is indispensable, CEP points out it has completed preparation of a project proposal to undertake detailed research of optimal utility conservation programs in New York State and, for a cost of $232,000, which it encourages the Commission or other parties to furnish, it can provide the results by March 1982. But this response merely illustrates the vagueness of the conservation plan as currently formulated, and the infeasibility of its pursuit as an alternative to Shoreham. CEP here admits that nearly a year is necessary to prepare a detailed plan of specific conservation measures of

implementation in New York State. And, as staff argued to the Judge, without such a detailed proposal it is impossible to compare the relative cost-efficiencies of a conservation program and Shoreham's completion. Moreover, unanswered questions remain concerning the institutional barriers to implementation of such a program--including the statutory and regulatory restrictions on a utility's involvement in conservation activities, the easing of which, in turn, involves a number of fundamental policy questions. Given this uncertainty, Judge Levy's ultimate conclusion--that it would be "imprudent and inadvisable" for us to contribute to Shoreham's delay to investigate further the conservation alternative--is sound.

While we adopt Judge Levy's recommended disposition of this proceeding, our decision to do so does not mean we deny in any way the importance of using conservation as a means of bringing the overall demand for energy into balance with its supply. For the reasons already described, we do not consider the energy conservation program here a reasonable alternative to the completion of Shoreham; and we question whether a proceeding of this type, in which a conservation program is considered simply as an alternative to a nearly completed power plant, is a reasonable forum for examining the complex role conservation can play in the State's energy policy. A more suitable forum would be the Energy Planning Board's master planning proceeding, and we fully expect our staff to consider conservation proposals in this and other contexts. Conservation initiatives may also require legislation before they can be carried out; and we expect staff to suggest legislative proposal that ought to be offered. Id. at 98-100.

PECO's Conservation Program

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 33-45; 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.

Although this issue is not one which the Commission has asked to be investigated, because of the time spend during the hearing phase

of this proceeding on the area, a discussion of the various contentions seems appropriate.

The City, for example, compared electric-related conservation expenditures for Pacific Gas & Electric Company (PG&E) with those of PECO's and found PG&E expected to spend some $88.3 million in 1981 and some $103 million in 1982 according to budget projections (City Statement No. 3, p. 4). This includes some $15 million for in 1981 for PG&E's Zero Interest Program (ZIP) and solar water heating demonstration. PECO's expenditures for the same period were variously estimated at $10.9 million (PECO Statement No. 3C) and $6.7 million (City Statement No. 3).

Comparisons can be helpful or they can simply cloud the issue. The City and the company have engaged in an extensive argument over the comparability of programs. For example, the company includes its expenditures for its applicance centers in its total conservation expenditures. The City claims, on the other hand, that those centers do not concern themselves wholly with conservation, but with selling merchandise at a profit. It is of interest to note that these appliance centers, the costs of which are not recovered in rates, did make a profit in 1980, an activity which the City witnesses appear to disparage (City Statement No. 3, pp. 1-2). Since such profits would offset the need for revenue from ratepayers, such activity should not be discouraged. However, while there is nothing incompatible between conservation and profits, it seems obvious that the primary purpose of these stores is not to promote conservation (See Keystone Alliance Statement No. 1), and that inclusion of the costs of these facilities under the category of "conservation expenditures" is plain wrong.

The fact is clear that PG&E does spend considerable amount more than PECO; estimates range from 2 times (PECO Statement No. 3E, p. 4) to 12 times (City Statement No. 3, p. 22). Although PECO points out that PG&E's expenditure level is the result of orders from the California Public Utilities Commission contained in 1979 and 1981 decisions, it is also clear that PECO has seriously underestimated the desire for assistance by its ratepayers in conserving energy. For example, when the company under the Residential Conservation Service Program sent out bill stuffers to its ratepayers on July 6, 1981, notifying them of the availability of energy audits, it expected to get about 6,000 requests annually. By September 1, 1981 there had been 8,500 requests (Tr. 3129-30). The company, however, had no plans to increase its number of auditors. This hardly shows an eagerness on the part of PECO to capitalize on the interest of its ratepayers.

It is clear that PECO does not have a conservation program to compare with those of PG&E and TVA. At the same time, it is also true that this Commission has not provided an incentive to promote conservation through special rate treatment such has been given by other Commissions. California, for example, has a "Conservation Load Management Adjustment Clause" which permits cost recovery for the costs of load management programs without regulatory lag.

My finding, on the basis of the record here, that conservation is not a viable alternative to Limerick Unit I or II, is not in any way to be construed as either approval of the company's current level of expenditures for conservation or any indication that a vigorous conservation program should not be taken by PECO. Clearly this is not the case. Both conservation and Limerick should be pursued. There has

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been, however, no showing that conservation alone can negate the benefits to PECO and its ratepayers which will accrue from the completion of Limerick in the form of reduced dependence on oil-fired generation and the resultant lower rates.

The conservation programs set forth by the parties here have been too vague and unsupported and involve too many unanswered policy questions and too many potential institutional barriers to be viable alternatives. This Commission must assure itself that PECO's ratepayers will have available to them safe, adequate supply of electricity at reasonable prices. It cannot rely upon optimistic hopes, conjecture and surmise to do this.

DISCUSSION OF THE ANALYSES

For purposes here, we must decide which of the various analyses presents the most likely picture of the future. No one analysis is immune from criticism, but it is clear that some depend on inputs and variables which are more reasonable than others.

First, the analysis presented by the City's witnesses cannot be accepted for the purpose of halting construction of Limerick Unit II. That analysis arrives at a cost benefit for Limerick's completion by comparing the capital cost of constructing that plant with only three to five years of fuel savings. In addition, the conservation program, which it relies upon to supplant the power from Limerick, is unspecific in detail and its cost and effectiveness is not demonstrated. While the City does argue that the experience of certain other utilities demonstrates that a conversation/alternative supply scenario can permit

deferral or elimination of the second Limerick unit, there has been no demonstration that the conditions experienced by these utilities are comparable to those of PECO.

The City's suggestion that construction of Limerick II cease, while a conservation program is worked out to determine if such a plan can replace that unit is irresponsible at least. The earlier criticisms of the City's conservation plan need not be repeated. To delay construction while an attempt is made to remedy those defects could well result in much higher costs to the PECO ratepayers.

CEPA's analysis relies, in substantial part, on Dr. Kahn's testimony which has been previously discussed. As noted in that discussion, Dr. Kahn's quantification of the costs and measurement of the effectiveness of these proposals are in main cases unsupported or based on inaccurate assumptions.

The company has also alleged certain methodological errors to be present in this analysis. Specifically, PECO argues that Dr. Kahn's study does not present a consistent comparison of costs and benefits to either society or PECO and its ratepayers of Limerick II's completion versus a utility-financed conservation program.

According to PECO's witness Mr. Lawrence, Dr. Kahn made three errors in his development of the comparative costs of Limerick and conservation. These errors are as follows: 1) he ignored the company's sunk investment recovery proposal in calculating the cost-benefit threshold for conservation investments (i.e. decremental cost) even though his stated purpose was to obtain an area of general agreement

among the parties" as to that threshold level and despite citing disagreements over sunk cost treatment as his basis for selecting the decremental cost approach, 2) he failed to credit Limerick with its fuel cost savings though taking account of its complete capital costs in decremental cost determination, and 3) he used incorrect values for the change in sales levels, data which varies capacity factor as well as conservation levels and in averaging erroneously within his computational analysis in determining decremental cost levels (PECO Statement No. 11F, pp. 2-6).

PECO also notes that (PECO M.B., p. 115 (n. 20):

> Two of the three bases upon which Dr. Kahn calculated his decremental cost range of 31.5 mills/kwh to 35.3 mills/kwh are without any support (CEPA St. 5, pp. 5-7). Dr. Rosen has, as noted above, abandoned his second analysis which was employed by Dr. Kahn as the initial basis of his decremental cost calculation. Dr. Kahn's analysis based on Dr. Hieronymus' results is supported by neither Dr. Hieronymus nor PECO as it employs Dr. Rosen's Limerick construction cost, O&M and nuclear capacity factor assumptions. As Dr. Kahn's sole basis for employing the above analysis in determining decremental cost is his interest in establishing "an area of general agreement among the parties" (CEPA St. 5, p. 10, these cost calculations fall of their own weight. There remains only his employment of Company data, which is inaccurate for the reasons stated above.

It would appear that PECO witness Hieronymus correctly criticizes Dr. Kahn's analysis as mixing ratepayer/shareholder and social cost measurements. Dr. Kahn asserts that he performs a ratepayer cost analysis, but includes in that analysis the full cost savings to the conservation investment recipient arising from conservation investment. Such savings are a social cost saving and not a ratepayer saving.

A ratepayer cost-benefit analysis would require application of the "no-losers test", that is non-participating ratepayers would not be disadvantaged, which Dr. Kahn admits that he did not apply (PECO Statement No. 15B, pp. 5-8; CEPA 5, p. 6). Dr. Kahn's analysis fails as a "social cost analysis" as he has failed to include the full social cost of conservation investment, i.e. the cost of recovery of its capital investment (i.e. depreciation) and its operating and maintenance cost. His analysis cannot, therefore, be relied upon to compare Limerick with conservation investment.

The record here contains four separate analyses by the Consumer Advocate's witnesses and a fifth one contained in the OCA main brief. All contain assumptions which make their use as indicators of the future unreliable.

OCA at one point in this proceeding termed its approach "iterative" -- which, according to Webster's, means "marked by or involving repetition or recurrence" and which in practical terms here means redoing the analysis until the result desired occurs.

The first analysis was contained in Dr. Rosen's initial testimony filed in February 1981.

Employing Dr. Stutz' two load forecasts and PECO's 1980 load forecast, as well as various financial and capital attraction cost assumptions provided by OCA witness Czahar, Dr. Rosen prepared the Advocate's first generation planning study using the SYSGEN production costing model and ELFIN financial model. As data in-puts to this analysis, Dr. Rosen employed Limerick and alternative plant capital and operating and maintenance cost levels derived from various regression equations which he developed. Additional assumptions were made by Dr. Rosen as to

fuel costs and plant operating availability (OCA Statement No. 1, pp. 38-41; Tr. 1986). The analysis examined anticipated Limerick and alternative plant cost levels during the period 1980-1999 and provided for a 10-year amortization without permitting collection of a return on the unamortized balance for Limerick sunk investment in the event of plant termination (OCA Statement No. 1, pp. 4-5). It should be noted that Dr. Rosen performed no "sensitivity" or "uncertainty" analyses to determine the range of reasonable estimates which would support his conclusion that the Limerick Station should not be completed.

As shown in Table XI, which is a copy of PECO Exhibit 6, Table 1 introduced into the record and confirmed as accurate by Dr. Rosen during his cross-examination (Tr. 1987-1997), that analysis concluded that completion of neither Limerick Unit was economic or necessary under either ESRG forecast and that completion of Limerick Unit I only was economic under the PECO forecast. However, prior to his appearance for cross-examination, Dr. Rosen discovered a significant number of mechanical errors in the preparation of this original analysis. Accordingly, on May 5, 1981, a second analysis was presented. The errors corrected included principally the entry of erroneous data into the ELFIN model from the SYSGEN model with respect to fuel and operating and maintenance expense, inappropriate recognition of the capital cost of the coal conversion of Delaware 7 & 8 as proposed by Dr. Rosen and in estimating the Limerick Station's operating and maintenance expense from Dr. Rosen's regression equation (Tr. 1988-97). Upon the correction of these errors, Dr. Rosen revised his original testimony to reflect the fact that the completion of Limerick Unit I had now become the economic choice under

the ESRG forecasts and that the completion of both Limerick Units was as economic as the completion of Limerick I under the PECO forecast (OCA Statement No. 1, pp. 4-5, 14, 20-23; PECO Ex. 6, Table I).

Other corrections were made during the course of Dr. Rosen's cross-examination. As shown in Table XII and as admitted by Dr. Rosen on the record, these corrections included additional errors in the transpositon of data from SYSGEN to ELFIN, additional corrections to the projections of Limerick operating and maintenance expense and corrections to the gross receipts tax and state income tax rates employed in the OCA analysis. As the result of these corrections, completion of

TABLE XI

PECO Exhibit 6
Table 1

Comparison of Original (2/27/81) and Revised (5/5/81)
Table 1 from Direct Testimony of Richard A. Rosen
(1979 Present Worth $ x 10^6)

Correction Description	ESRG Base Forecast O(L.II)	ESRG Base Forecast T(L.I)	ESRG Base Forecast S(NL)	ESRG Base Forecast U(SUS)	ESRG Conservation Scenario C(L.II)	ESRG Conservation Scenario I(L.I)	ESRG Conservation Scenario N(NL)	PECO Forecast A(L.II)	PECO Forecast G(L.I)	PECO Forecast F(NL)
1a. Program Lost - Cumulative Present Worth - Original Testimony (2/27/81)	$21,568	$21,004	$21,085	$20,906	$19,286	$19,222	$18,977	$23,949	$21,888	$24,405
b. Program Ranking Within Forecast	4	2	3	1	3	2	1	2	1	1
c. Apparent Least Cost Program	SUSQUEHANNA - NO LIMERICK				COAL - NO LIMERICK			LIMERICK I		
2. Corrections to Original Table 1 (OCA Communition of 5/1/81)										
a. 1981-1984 Fuel + O&M Error (5/1/81 Communication Item 1)	134		353	353						
b. 1985-1999 Fuel + O&M Error (5/1/81 Communication Items 2 & 3)						(423)			131	
c. Delaware 7 & 8 Capital Cost (5/1/81 Communication Item 5)	116									

Correction Description	ESRG Base Forecast O(L.II)	ESRG Base Forecast T(L.I)	ESRG Base Forecast S(NL)	ESRG Base Forecast U(SUS)	ESRG Conservation Scenario C(L.II)	ESRG Conservation Scenario I(L.I)	ESRG Conservation Scenario N(NL)	PECO Forecast A(L.II)	PECO Forecast G(L.I)	PECO Forecast F(NL)
3a. Program Cost - Cumulative Present Worth - PECO Arithmetic Corrections	$21,028	$21,011	$21,452	$21,253	$19,224	$18,760	$18,977	$23,887	$24,031	$24,405
b. Program Ranking Within Forecast	1	1	4	3	3	1	2	1	2	3
c. Apparent Least Cost Program	LIMERICK I/II				LIMERICK I			LIMERICK II		

both Limerick units became the economic alternative under the PECO forecast, completion of both Limerick Units and Limerick Unit I only were of equal cost under the ESRG base forecast while completion of Limerick Unit I only became the economic choice under the ESRG conservation scenario (PECO Exh. 6, Table 2; Tr. 1997-2019).

In addition to the errors admitted by the OCA witness, PECO presented Dr. William Hieronymus who testified that the OCA analysis is methodologically insufficient to test whether one or more Limerick units could be economically replaced by coal-fired generation. In particular, he stated the OCA methodology improperly treated the already-expended costs of Limerick construction and ignored the benefits of the cost savings which Limerick is likely to produce over the second half of its life.

Furthermore, he stated these errors of methodology and application of methodology are sufficient to fundamentally alter the results of these witnesses' studies. Correcting the various errors in input data and transcription, and in these witnesses' use and modification of the models showed that completing both Limerick units becomes the most cost-effective option under all three scenarios. Savings range from 1,300 million dollars relative to the all coal option in the ESRG base scenario to some $300 million dollars relative to completing only Limerick I in the PECO scenario. (See Table XIII).

Finally, he noted, correcting for the failure to model costs on a life cycle basis and to properly account for sunk costs make completion of both units cost-effective by billions of dollars in all three load growth scenarios. These results all are based on Dr. Rosen's

TABLE XII

PECO Exhibit 6
Table 2

PECO Additional Corrections to Revised (5/5/81)
Table 1 from Direct Testimony of Richard A. Rosen
(1979 Present Worth $ x 10⁶)

Correction Description	ESRG Base Forecast				ESRG Conservation Scenario			PECO Forecast		
	O(L.II)	T(L.I)	S(NL)	U(SUS)	C(L.II)	I(L.I)	N(NL)	A(L.II)	G(L.I)	F(NL)
1a. Program Cost - Cumulative Present Worth - Revised Testimony (5/5/81)	$21,931	$21,044	$21,438	$21,259	$19,399	$18,839	$18,977	$24,062	$24,059	$24,405
b. Program Ranking Within Forecast	4	1	3	2	3	1	2	1	1	1
c. Apparent Least Cost Program		LIMERICK I				LIMERICK I			LIMERICK I/II	
2. PECO Additional Corrections to Revised Table 1 (5/5/81)										
a. 1985-1999 Additional Fuel + Oil Errors	(733)			(20)		(46)			5	
b. Limerick O&M Additional Errors	(175)	(33)			(175)	(33)		(175)	(33)	
c. 1981-1984 O&M Errors (GRT)	5		14							

Correction Description	ESRG Base Forecast				ESRG Conservation Scenario			PECO Forecast		
	O(L.II)	T(L.I)	S(NL)	U(SUS)	C(L.II)	I(L.I)	N(NL)	A(L.II)	G(L.I)	F(NL)
2d. Limerick O&M Expense Understatement (5/1/81 Communication Item 4).	113	40			113	40		113	40	
3a. Program Cost - Cumulative Present Worth - Revised Testimony (5/5/81)	$21,931	$21,044	$21,438	$21,259	$19,399	$18,839	$10,977	$24,062	$24,059	$24,405
b. Program Banking Within Forecast	4	1		2	3	1	2	1	1	1
c. Apparent Least Cost Program		LIMERICK I				LIMERICK I			LIMERICK I/II	

TABLE XIII

Schedule A - Revised

Net Costs of Limerick Cancellation Cases

(Net Costs Relative to the Two-Limerick Scenarios in Millions of 1981 Present Value Dollars)

Description of Simulation	CONSERVATION (-0.5% Growth)		BASE (1.1% Growth)			PECO (2.2% Growth)	
	I (LIM I)	N (Coal)	T (LIM I)	S (Coal)	U (Susq & Coal)	G (LIM I & Coal)	F (Coal)
Rosen Original Testimony	(317)	(400)	(729)	(624)	(856)	(79)	590
Rosen Revised Testimony	(724)	(546)	(1146)	(637)	(868)	(4)	444
All Corrections to Pre-1999 Revenue Requirements Incorporated	351	588	1043	1360	965	302	1788
Correction For Sunk Costs; Life Cycle Costs Incorporated	2651	3398	3632	4537	3618	1511	5300

assumptions with respect to nuclear plant costs, O&M cost escalation, and Limerick capacity factors.

In surrebuttal testimony filed in August 1981, Dr. Rosen presented a third analysis (OCA Statement No. 1B). Here the witness presented "the results and implications of the refinements, corrections, and revisions" that he made to his previous analyses. He summarized his conclusions as follows (OCA Statement No. 1B, pp. 2-4):

> The best investment choice is to pursue a conservation investment program to reduce electricity demand growth as well as oil and gas use at building sites. Improvements in the PECO planning process can help ensure a successful conservation program.
>
> By integrating conservation investment into the long-range planning process, two related planning options emerge. If certain supply side investments offer no clear economic advantage, then their postponement or cancellation can release planning and economic resources that can be directed towards implementing a more flexible conservation program. On the other hand, given these resources and sufficient planning, a comprehensive conservation program can effect a reduction in demand growth sufficient to preclude the need for certain supply side investment options. Thus, unnecessary investments can be avoided and the most economical supply/demand match over time can be effected. In this manner, generation planning is transformed into the broader and more flexible enterprise of resource planning.
>
> PECO has not successfully supported its case in favor of completing the Limerick Station. Under any demand forecast scenario, including that of the Company, there appears to be no significant penalty to ratepayers if Limerick is cancelled. Indeed, my results show that there are likely to be economic benefits. Thus, other non-economic policy issues and factors can play a decisive role in the policy debate as to whether or not the Limerick construction project should be terminated. In fact, under the ESRG Base and Conservation Scenario, completion of one or both Limerick units is found to be <u>less</u> economical than a construction program consisting either of a purchase of 500 MW of power from the Susquehanna plant or a program consisting entirely of new coal plants.

Delay of the Limerick plant beyond the Wass probable in-service dates of September 1, 1985 for unit #1 and April 1, 1988 for unit #2 would substantially increase the cost of this option to ratepayers. Even if completed by these dates, the total capital cost of Limerick would be about $6.6 billion.

The economics of the Limerick construction program are quite sensitive to the PJM Power Pool demand growth rate assumed. The above conclusions follow from assuming a 1.7% PJM energy growth rate from 1980-2000. If the PJM growth rate is actually less than this, then the Limerick construction program becomes relatively less attractive than is indicated above, no matter what the PECO demand growth rate is.

It was at this time also, that Dr. Rosen stated that a two-area production costing model (such as PECO's SOBIG) would better reflect PJM energy transactions and that such transactions could not be done on its single area SYSGEN model. In addition, he stated that the economics of Limerick are dependent on future PJM Power Pool demand growth rates.

The reliability of this third analysis was questionable. In addition to the inability of his model to cost out energy production for various alternative generation scenarios and to develop interchange power costs, Dr. Rosen could not quantify what effect a reduction in PJM load growth to 1.7% would have on planned PJM capacity for the 1990's. (OCA Statement No. 1B, p. 60)

During his cross-examination, Dr. Rosen stated that the inability to match with precision the details of the exact amount of new capacity that might be on-line at any year was a potential source of error which would require either an upward or downward revision of the number used in his analysis (Tr. 3441). Similarly, he stated that his model did not reflect changes in the price of purchased power (Tr. 3450-51), and also imposed an inaccurate transmission constraint on

energy purchases, an inaccurate matching of sales and purchases quantities and prices between Limerick and non-Limerick cases, and imposed arbitrary time and unit origin constraints on sales (Tr. 3442-3444).

PECO witness Hieronymus reviewed the OCA third analysis (PECO Statement No. 15A). This review used the OCA's assumptions as its foundation and showed that by correcting what he termed various errors and inconsistencies in the OCA analysis with respect to production costing and the treatment of various capital-relating items, the conclusion was reversed. Under Dr. Hieronymus' revisions, Limerick completion saves $992 million in present value under PECO load growth assumptions and $426 million under ESRG load growth assumptions. The net cost of completion falls to $27 million under an assumption of negative load growth -- but that is based on the assumption that a decline of nearly 50% in the PJM growth rate will result in no plant cancellations or deferrals over the next twenty years. If that assumption is corrected, Limerick completion yields savings to ratepayers even under OCA's negative load growth assumptions for PECO.

Correcting for the production cost modeling difficulties admitted by Dr. Rosen and for errors his nuclear plant capital cost analysis (OCA Statement No. 1C, p. 8), substitution of an April 1982 plant cancellation date instead of the December 31, 1981 date used by Dr. Rosen (OCA Statement 1B, p. 8) and recognition that reduced PJM growth rates of 1.7% would result in the cancellation of certain planned units used in the Rosen analysis[19/] but using Dr. Rosen's other assumptions as to construction costs, operating levels, life cycle savings and

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19/ One unit of the planned PSE&G Hope Creek plant has been cancelled since this testimony was given.

sunk cost treatment, Dr. Hieronymus found that the savings to the ratepayers from the completion of Limerick varied from $236 million to $992 million (PECO Statement No. 15A, pp. 1-3, Table 9, line 4).

If the OCA's third analysis were further adjusted to reflect the results of Dr. Hieronymus' modification of Dr. Rosen's assumptions as to future nuclear and alternative plant construction and operating cost levels, and of the methodological differences respecting the treatment of sunk costs and life cycle savings, the cost benefits of Limerick Station completion (i.e. both units) vary from $1199 million to $3822 million in 1979 present value dollars and even using Dr. Rosen's 14.7% discount rate selection (PECO Statement No. 15A, Table 9, line 7).

The modification employed in Dr. Hieronymus' analysis to Dr. Rosen's "in-put" cost assumptions was to set those assumptions at a value midway between the Rosen estimates and PECO estimates. Accordingly, Dr. Hieronymus' results, PECO argues, deliberately understate total Limerick Station completion savings (PECO Statement No. 15C, p. 1). 20/

One additional point is worth commenting on -- that is the effect on the OCA analysis of the treatment accorded sunk costs. Dr. Rosen proposed the write-off of approximately $1.9 billion in sunk costs as of December 31, 1981 ($2.2 billion as of April 30, 1982) for both Limerick units over 10 years with no return on the unamortized balance (OCA Statement No. 1B, p. 8).

In a discussion with PECO counsel, OCA financial witness Czahar testified as follows (Tr. 3494-3500):

20/ A table showing, Dr. Hieronymus' determination of these various cost savings is appended to this decision as Appendix D.

Q. Mr. Czahar, would you agree with me that this Commission and really any commission has a responsibility to both the ratepayers who pay the utilities' bill and also to the investors who in fact have provided capital for use in the utilities' operations?

A. I would suggest that not only do they have some type of a moral responsibility, but because of the symbiotic relationship between ratepayers and investors in that one is dependent on the other for their needs, etc., that it is incumbent on the Commission to try and get that balance thay you have just mentioned as far as fairness and equity to each party.

....

Q. [W]ould you agree with me that the carrying charges on capital that is invested in utility facilities... are... a real economic cost, especially to the investors in the facility who have provided the capital; do you agree that is a correct statement?

A. Yes, sir; there is a cost there, absolutely.

....

Q. Mr. Czahar, we have agreed that by comparing I and II in the case N1* one sees that there is a $1 billion-approximately $1.1 billion cost which is not reflected in the results presented under I; is that correct?

A. That is correct.

Q. And that cost is, in fact, the capital carrying charges on the sunk investment of Limerick; is that not correct?

A. That is correct.

Q. Let us assume that this commission would be asked or requested or directed by some of the parties in this case to examine only the results which are presented in No. I, would it not be correct that if the Commission accepted this suggestion that indeed that was the only of your three cases to examine, would it not be correct that the commission would be

*OCA Statement No. 2B, Sch. E.

ignoring and would not be considering this $1 billion cost to the investors of the company?

A. If the commission were to assume--and I would have to put this essentially in the answer--that the difference between these two cases in somehow not real, not identifiable and isn't a factor that they must consider in their decision-making process, I believe they wouldn't be getting the whole picture on what evidence they need to make a decision.

Q. And I take it from your answer that you would not recommend that the Commission only look at the result stated in I?

A. No, sir.

Q. And that position, as I understand it is that--you personally, I suppose, would come out somewhat between Case I and the other two cases in terms of considering the return on the sunk investment?

A. Yes, and let me explain why. ...[W]e must keep PECO in a position that it can do the alternatives that we have been discussing, at least our side has been discussing in this case all along; be that additional coal units or be that a conservation unit, PECO has to still be able to go out and get capital on reasonable terms to do the alternatives we are talking about.

Therefore, I would state from my own personal standpoint that we must keep PECO in a position to do the alternatives as we evaluate the Limerick scenarios.

....

Q. Referring you back to Schedule E, you have indicated that it would be your--if you were the ratemaking authority and if you were deciding upon a fair balance between investors and shareholders, you would pick some level of return or recovery of allowance which would be between Case I and Cases II and III; is that not correct?

A. Yes sir.

Under the third or any OCA analysis, if sunk Limerick investment is included in rate base, at least as to a portion of that investment, during the period of its amortization, then, there is no question that both ratepayers and investors are economically advantaged by the plant's completion, even if the OCA is correct as to all other economic matters at issue in this proceeding. According to Dr. Hieronymus, and agreed to by OCA witness Czahar, the present value cost associated with this "real cost" equals $1,200 million for Limerick Station termination. As respects the cancellation of Limerick II only, this present value cost equals approximately $265 million (PECO Statement No. 15A, p. 4; Table 9).

PECO argues (PECO M.B., p. 90) that if the Commission disagrees with the OCA position on any significant Limerick or alternative construction or operating cost projection to any significant degree; 2) disagrees with the OCA's position as to future PECO or PJM load growth to any significant degree; 3) rejects the OCA's position on any methodological question (discussed below); 4) determines that sunk investment through April 30, 1982 and the effects of recent PJM unit cancellations should be considered, or 5) accepts PECO and OCA witness Czahar's opinion that a return upon unamortized sunk investment should be permitted, then it must be concluded on the basis of the OCA's own computer analysis that Units I and II are economic and necessary.

In October 1981, OCA witness Dr. Rosen filed surrebuttal testimony (OCA Statement No. 1C) which presented yet another analysis -- the fourth -- in the form of criticism of Dr. Hieronyomus' Statement No. 15A, which had discussed Dr. Rosen's third analysis.

Dr. Rosen first maintained that reliance on the PJM "split savings" to price interchange transactions biased the results of the

SOBIG production costing model in favor of Limerick (OCA Statement No. 1C, pp. 5-6).

While it is generally conceded that the "split savings" pricing mechanism is not cost based, efforts to alter the standard have been unsuccessful (PECO Statement No. 11H, p. 10). There is little prospect of change in the near future. The Commission, therefore, cannot ignore Dr. Rosen also criticized Dr. Hieronymus for not taking into account in the SOBIG runs all the available power imports from systems outside the PJM that are likely to exist in the future. Dr. Rosen expected that significant amounts of coal power will be available to the PJM from other U.S. utilities and, increasingly, from Canadian utilities in the 1981-1990 time period. This would be due to lower than expected demand growth rates in most regions in and around the Mid-Atlantic region, including Canada. However, as PECO points out, these future low cost sources of PJM generation are neither identified nor quantified.

Dr. Rosen stated that Dr. Hieronymus has not taken into account all the economical coal conversions that are likely to occur within the PJM system. This would mean that Dr. Hieronymus' production costing runs have tended to overstate the cost of imported power to PECO, and have thereby caused the Limerick construction scenario to appear to be more expensive than might be the case. Dr. Rosen stated that he could not incorporate these coal conversions into his analysis since PECO refused to let the OCA do SOBIG runs with any changes other than the demand growth rate for PJM. Thus, changes in the plant mix would not be made to generate data for his SYSGEN Model runs.

As has been previously discussed, however, these economical coal conversions, at least for the PECO system, do not exist.

Dr. Rosen's third analysis, and thus Dr. Hieronymus' analysis in Statement 15A, relied on the assumption that non-PECO PJM demand growth will be 1.7% per year indefinitely, which was the actual rate of growth over the past seven years. However, Dr. Rosen now believed given likely economic conditions, that PJM demand growth will taper off during the 1980's, and thus demand will actually be lower than he has assumed in his computer runs. This, he stated, would tend to make the Limerick construction program still less economically favorable for ratepayers. Again no independent basis is given for this assertion, which, one notes, contradicts his own previous assumption, contained in the third analysis, as to PJM growth rates.

Dr. Rosen also noted that, due to recent developments, the price of oil does not seem to be escalating nearly so fast as he has assumed it would. Again, if this trend continues, the economics of the Limerick construction program will be even less favorable than he has previously indicated. Whether this trend will continue for the future is highly conjectural and, it should be noted Dr. Rosen, himself, does not say that this recent trend will continue.

Finally, Dr. Rosen testified, the economic results that Dr. Hieronymus reports which incorporate the effect of the presumed benefits of Limerick after the year 2000 must be considered purely speculative given the significant probability that Limerick will not operate much beyond the year 2000. Also, related to the likely degree of equipment failures at Limerick in the future, is the probable level of O&M expenses that will be incurred in the post-2000 time frame.

There, too, he argued, Dr. Hieronymus arbitrarily decided to favor the Limerick scenarios by only escalating O&M expenses after 1999 at the rate of inflation instead of consistently using the ESRG equation.

In conclusion, Dr. Rosen stated that Dr. Hieronymus' Schedule G of PECO Exh. WHH-3 supports his conclusion that conservation is the preferred alternative to Limerick - Schedule G is shown on Table XIV in this decision. As the title of that Table reflects it purports to show the revenue requirements for Limerick using the SOBIG costing model and the OCA assumptions, corrected to reflect Dr. Rosen's corrections in the distribution of sunk and future costs and the distribution of common costs between the two units.

Specifically, Dr. Rosen testified (OCA Statement 1D, pp. 16-18):

Q. In summary, given this new piece of analysis performed by Dr. Hieronymus, and the rest of the record in this case with which you are familiar, what would you recommend to the Pennsylvania Public Utility Commission regarding the Limerick construction program?

A. Given all the research that has gone into this investigation, it is quite unfortunate that the Office of Consumer Advocate was never given the freedom to run all relevant generation scenarios with the SOBIG Model for use in preparing the testimony it sponsored. Thus, as I have cited above, many realistic power supply possibilities within PJM, but external to the PECO power supply system, could not be analyzed to the extent that would have been desirable. However, in spite of these limitations, and the fact that I (and Dr. Hieronymus) were always implicitly forced to utilize the split savings methodology for calculating the cost of purchased power to PECO, the results cited in Dr. Hieronymus

Schedule G basically demonstrate the substantial advantage of conservation investments relative to the advantage of continued construction of Limerick. Of course, I again want to make it clear that, based on the reasons given above, I believe that Dr. Hieronymus' Schedule G results are still strongly biased in favor of the Limerick program. This Schedule G represents what I believe to be by far the most optimistic case that can be made for continued construction of Limerick. Thus it is worth taking a few moments here to study the implications of these Schedule G results that have been obtained using PECO's SOBIG Model.

First of all, the "PECO" Scenario for demand growth is an implausible scenario given recent events, and thus we can ignore those results of for planning purposes. Secondly, the results listed under the "ESRG Base" Scenario demonstrate that even without any affirmative conservation program, the Company has not sucessfully supported its case that the two Limerick units are cost effective by a wide margin. Schedule G shows that case U1 involving the purchase of 500 MW of the output from the Susquehanna units and cancellation of both Limerick units is basically the same cost to ratepayers as the Limerick program O1. In addition, the costs of cancellation are much more precisely known at this point than the potential costs of continued construction once all the risks that this implies are considered, including the risk of further scheduling delays beyond the Wass probable dates.

But the most dramatic results from Schedule G is again the fact that pursuing the No Limerick "ESRG Conservation" Scenario Case N1 (which includes purchase of Susquehanna output) will save ratepayers more than $2.1 billion 1979 present worth dollars, when compared to the Limerick construction case O1. Cases I1 or I2 involving construction of Limerick #1, but not Limerick #2, do not save quite as much money for ratepayers (about $1.8 billion), but they reduce any adverse impact on stockholders. While C2 involving construcion of both Limerick units is also close, I do not believe it is a realistic option. The simple reason for this is that I do not believe that PECO has the administrative and financial capability to complete both units of Limerick on time and simultaneously pursue as massive a conservation program as the ESRG program is. However, the more massive the conservation program, the greater the savings to consumers, so this program should not be compromised or cut back at all as the Company has

argued in their testimony here. The clear implication is that the Limerick program, especially Limerick #2, is an investment program of secondary importance, and therefore is the one that must be cut back as in cases I1, I2, N1 or N2 to accomodate conservation, and not the other way around. Thus the one compelling interpretation of the record that emerges from this case is that a comprehensive conservation program like the ESRG program is of the highest priority due to its clear economic superiority, and therefore at least Limerick #2 should be cancelled to allow such a program to be implemented.

To repeat, the reason for this is that I believe that, given PECO's limited resources, the investment and managerial requirements of a comprehensive conservation program are incompatible with continued construction of Limerick Unit #2, and perhaps both of these units. Such a program, however, should produce substantial savings for ratepayers and should be given top priority by this Commission.

TABLE XIV

Schedule G

REVENUE REQUIREMENTS CORRECTED FOR LIMERICK COST ALLOCATION ERRORS
(Revenue Requirements in Millions of 1979 Present Value Dollars)

Load Growth Scenario	Cumulative Revenue Requirement	Difference Form 2-Limerick Cases
"PECO" Scenario		
A1	26,783	--
G2	27,055	+ 272
G3	27,263	+ 480
F2	27,436	+ 653
"ESRG Base" Scenario		
O1	22,594	--
T2	22,864	+ 270
T4	23,094	+ 500
U1	22,681	+ 87
S2	22,891	+ 297
"ESRG Conservation" Scenario		
G2	20,819	--
I1	20,788	- 31
I2	20,798	- 21
N1	20,455	- 364
N2	20,609	- 210

Dr. Hieronymus, I believe, correctly points out that Dr. Rosen appears to have forgotten that his (Hieronymus') calculations accepted for mathematical purposes various Rosen assumptions. Now, it appears, Dr. Rosen argues with the use of those assumptions, calling them strongly biased in favor of Limerick:

> "For example, Dr. Rosen originally accepted and made use of the Company's SOBIG runs as a basis for purchased power pricing. In rebuttal, I made that same assumption. When it became apparent that Limerick was cost-justified based on his original assumptions, he modified them. Among those modifications was the contention that the PJM growth rate would be only 1.7 percent. Again, I accepted that assumption for purposes of calculation. Again, my analysis showed that Limerick was cost-justified. Now he argues that 1.7 percent growth is too high an biases the analysis in favor of Limerick.
>
> A similar pattern is apparent in his estimate of Limerick construction cost, which he increased in his surrebuttal testimony and now contends is too low, and completion date, which he deferred and now contends is too early. Dr. Rosen has had two opportunities to make whatever assumptions he felt he could support. His present contentions simply indicate an unwillingness to accept any set of assumptions which result in Limerick being cost-justified, including his own." (PECO Statement 15C, pp. 1-2).

I find no basis for not using sunk investment as of April 30, 1982 in calculating the cost of Limerick. Nor can I agree with his refusal to adjust the PJM construction program to account for lower load growth (OCA Statement 1C, pp. 9-10), as Dr. Hieronymus pointed out:

> "In my opinion, a substantial reduction in the PJM growth rate unaccompanied by a reduction in planned capacity is unreasonable. It will bias the economics of Limerick completion since a likely consequence of reducing PJM load growth without eliminating or deferring planned capacity would be an excess of non-oil-fired base load capacity.... I specifically requested that Hope Creek be eliminated. While I have not made any investigation of whether Hope

Creek is or is not economic under ESRG nuclear plant cost or load growth assumptions, I note that it is less far along and to be completed at a later date than Limerick. Since it is the position of witnesses for the OCA that Limerick should be cancelled and that nuclear capital and O&M costs are substantially increasing in real terms over time, it is only appropriate that its economics be tested under the assumption that a plant which in Dr. Rosen's view would likely be less economic is also cancelled." (PECO St. 15A, pp. 17-18).

Furthermore, even allowing a partial return sunk costs would show a Limerick completion advantage in all cases. Finally, as I have previously discussed, the conservation program set forth by the OCA is not a practicable alternative to Limerick.

As noted earlier, in its brief, the OCA set forth a fifth analysis (OCA M.B., pp. II-22 to II-28). That analysis states that:

(1) The approval of CWIP in rate base is required to complete construction of Limerick Units I and II on the Forecast 5 Schedule at a cost OCA witness Czahar has quantified at a 1979 present value of $461 million;

(2) Schedule G of PECO Exhibit WHH-3 is the most accurate production costing analysis;

(3) There are non-quantifiable uncertainties which argue against the completion of Limerick;

(4) The present value of carrying costs associated with Limerick's sunk investment can be quantified from Mr. Czahar's analysis and used to obtain an assessment of the effects of alternative rate treatment of sunk investment.

If the Commission accepts what the OCA terms a sharing of the sunk cost burden (disallowing carrying costs associated with sunk costs) as well as the other components of the OCA's analysis, cancellation of Limerick Units I and II is the least cost alternative. If the Commission grants PECO full sunk cost recovery (allowing full recovery of carrying costs associated with sunk costs), then completion of Limerick Unit I

only is the least cost alternative at the ESRG conservation scenario and is only marginally more expensive than completion of both units at the ESRG base case growth rate. PECO points out that no witness, either of the OCA or any other party, has sworn to the accuracy and meaningfulness of the particular combination of computer based analyses which the OCA counsel presents. In essence, PECO argues, the OCA has taken a piece of witness Czahar's testimony (i.e. the CWIP analysis), a piece of witness Rosen's testimony (Ex. WHH-3, Sch. G) and a piece entirely of Counsel's own creation (i.e., the quantification and alternative treatment of sunk costs) and has combined the three into an "analysis" with an asserted meaning the truthfulness and accuracy of which has not been sworn to by any witness. I agree with the company that it would be arbitrary and caprious for this Commission to accept as the basis of a decision here, an "analysis" advanced for the first time in brief; especially, when the OCA's witnesses have had ample opportunity to refine their presentations to encompass this scenario. In addition, the individual components of this scenario are in error. Mr. Czahar's CWIP analysis assumes a 60% CWIP in rate base allowance in the years 1982-1986 and further assumes a reduction in PECO's debt capital rate from 50 to 46%. (OCA Statement No. 2B, pp. 10-11). Mr. Czahar presented no evidence that a 60% CWIP allowance is required if PECO is to complete the Limerick Units I and II. (OCA Statement No. 2b, pp. 9-11; OCA Statement No. 2c, p. 1). The company is claiming in R-811626 the amount of $500 million in CWIP in rate base to be included in rates in effect in 1982 and early 1983;

Mr. Czahar's 60% assumption would require a $1.4 billion CWIP allowance in 1982.[21] This is clearly an error. (Docket No. R-811626, PECO Exh. DPS-2, p. B-5; PECO Statement No. 15A, pp. 25-26). Mr. Czahar has also failed to present evidence or even an opinion as to whether a CWIP allowance would be required to permit PECO to complete construction of Limerick Unit I only or any of the other ESRG alternatives. Accordingly, the principal, albeit unstated, assumption of the OCA's argument, i.e. that CWIP is required only for completion of Limerick Units I and II and not other alternatives, has no foundation in the record.

In its Brief, the OCA attempts to explain Mr. Czahar's 60% CWIP allowance and debt capital ratio assumption, (OCA M.B., II-23), asserting that the 60% ratio is based upon the company's claim at Docket No. R-80061225 for a debt interest expense adjustment associated with Limerick CWIP, contending that the claimed expense amount equalled "about 60% of AFUDC". In support of the debt ratio assumption, which accounts for approximately one-half of the total alleged CWIP cost penalty (OCA Statement No. 2b, pp. 9-11; PECO Statement No. 15A, pp. 25-27), the OCA states that it reflects Mr. Czahar's assumption that, despite the allowance of 60% of CWIP in rate base, PECO will continue to be unable to sell stock at book value, achieving only an 80% market to book ratio, which same assumption is employed by the witness when no CWIP is allowed (OCA M.B., pp. II-23 to II-24).

21/ Approximately $2.35 billion current Limerick sunk cost x 60% = $1.4 billion.

At Docket No. R-80061225 however, PECO's claimed debt interest adjustment equalled an additional revenue allowance of $82 million at a time when its CWIP balance for Limerick exceeded $1.5 billion. In its current rate proceeding at Docket No. R-811626, the company's claim for $500 million of CWIP, approximately 1/3 of the balance existing at the time of the earlier proceeding; this produces a revenue claim of $106 million (Docket No. R-811626, PECO Statement No. 1, pp. 20-25). It is difficult to see how this interest expense claim could be the basis of this 60% claim.

The OCA explanation of Mr. Czahar's reduction in the debt capital ratio relies upon the assumptions that PECO, though receiving a 60% CWIP in rate base allowance, will remain unable to sell stock at book value. Indeed, it is assumed that there will be no improvement in PECO's market to book ratio as compared with the no-CWIP case where a substantially lower cash return is provided. Such an assumption is clearly unreasonable.

Reliance upon Dr. Hieronymus' Schedule G is also misplaced, for the reasons noted earlier. Furthermore, as PECO noted, of the PJM unit cancellations forecast by Dr. Hieronymus to result from the OCA's reduced load growth, eight units of the total eleven units have already been cancelled or deferred. This, of course, includes Hope Creek II which the OCA admits has been cancelled (OCA M.B., p. II-75). This further confirms the unreasonableness of assuming that a reduced PJM load growth will not affect PJM additions -- the additions relied upon in the OCA's scenarios to supply PECO with low-cost energy purchases to replace Limerick generation.

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For these reasons, the OCA presentation cannot be relied upon to support cancellation of the Limerick Units.

After reviewing the several analyses here, it is apparent that, while not perfect, the company's presentation is the most reasonable.

Before discussing the specific areas of methodological dispute, a more general discussion may be helpful of the various disagreements among the parties. These disagreements, alluded to in the earlier discussions, include recognition of sunk investment and carrying costs associated with that investment, recognition of life cycle costs and benefits, the appropriate discount rate and use of normalization versus flow-through in recognition of possible tax deductions associated with Limerick cancellation.

PECO's sunk investment in Limerick at April 30, 1982 will be more than $2.2 billion (PECO Statement No. 11G, pp. 1-2). Accordingly, the treatment of both recovery of and recovery on a return upon sunk costs is a vital element measuring the Limerick completion/termination net benefit or cost, as discussed earlier with reference to Mr. Czahar's testimony.

PECO naturally claims that accurate measurement of the net benefit or cost of Limerick's completion or termination requires consistency in recognition of Limerick sunk capital investment both with respect to recovery of that investment and of the carrying costs associated with that investment. (PECO M.B. p. 127) This means that costs associated with that investment, which have already been incurred, and will therefore not be avoided as the result of the decision reached as

to Limerick completion or termination, be either consistently excluded or consistently measured in both the Limerick completion and termination alternatives.

The OCA, in measuring the net cost or benefit of Limerick completion or termination, has stated such measurements in terms of the relative present worth of ratepayer revenue requirements associated with each alternative. In measuring revenue requirements associated with Limerick completion, OCA has recognized both sunk cost recovery and associated carrying costs. In developing revenue requirements of the termination alternative, however, it has recognized sunk cost recovery but not the associated carrying costs. It recommends, instead, a ten year amortization permitting recovery of sunk costs but with no return allowed on the unamortized portion (OCA Statement No. 2, pp. 9-10). CEPA witness Dr. Kahn, provided only for a ten year amortization of sunk cost without return and developed his decremental cost estimate and performed his analysis on this same basis (CEPA Statement No. 5, pp. 6-10).

The OCA argues that as a result of PECO's poor performance in load forecasting, failure to pursue conservation and inadequate generation planning analysis as to plant capital costs, O&M expenses, fuel escalations and nuclear capacity factor, and PECO's failure to analyze all available options beginning in 1978 through November 1981 using production costing and financial computerized methodology, there should be no recognition of a return on sunk cost. Also it states, there are the financial benefits to stockholders from cancellation. Finally, ratepayers have already absorbed cost penalties associated with management's attempt to carry the burden of the Limerick project.

OCA argues that the Commission has recognized the principal of sharing the risk of diminution in the usefulness of plant between stockholders and ratepayers in past PECO cases (R-79060865) and should do so here.

The OCA also claims that in the event of termination, PECO should not be allowed to recover that portion of its sunk investment incurred after December 31, 1981 because PECO has been imprudent in continuing construction of Limerick pending the conclusion of this investigation.

I find the OCA's position unconvincing. The carrying costs associated with sunk investment are not avoided or made to disappear simply because of the Commission's non-recognition upon Limerick termination. As OCA witness Czahar stated these costs are very substantial and very real (Tr. 3495). If not recognized in the revenue requirements analysis, these costs are simply as borne by 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 which would threaten a utility's financial integrity as would, in my opinion, the disallowance of all carrying costs on this sunk investment as proposed by the Advocate and Dr. Kahn, would not be in the public interest.

Since sunk investment carrying costs are real costs, any analysis of whether ratepayers and investors are benefited or harmed by Limerick termination should include costs borne by both ratepayers and shareholders. The OCA analysis and Dr. Kahn's proposal ignore the carrying costs of PECO's sunk investment and therefore, do not present a complete picture.

The simple fact is that, unless the Commission allows at least a partial recovery of capital carrying costs associated with unamortized Limerick investment, the company's financial integrity and its ability to attract the capital required to pursue alternative generation or conservation programs would be impaired or precluded (PECO Statement No. 9, pp. 15-16). As stated by Dr. Perl (PECO Statement No. 12, p. 11):

> It should be noted that if Limerick were cancelled and the cost not passed on to consumers, the construction of a coal-fired alternative is clearly unrealistic. If the sunk costs had to be absorbed in whole or in part by stockholders, it would prove impossible for Philadelphia Electric and probably for any other Pennsylvania utility to finance any new capital expenditures for the foreseeable future. Under such circumstances, the alternative to Limerick would be continued use of economy interchange energy for which the cost would far exceed the alternative considered here.

Similarly, Mr. Czahar stated:

> We must keep PECO in a position that it can do the alternatives that we have been discussing...; be that additional coal units or be that a conservation unit, PECO has to still be able to go out and get capital on reasonable terms to do the alternatives we are talking about. (Tr. 3499).

This issue has recently been considered by the New York Public Service Commission in a recent case.[22/] There a separate proceeding was held to consider whether participants in a nuclear power project ordered terminated by a regulatory authority should be permitted to recover the

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22/ CASE 27794 - In the matter of the application of Rochester Gas and Electric Corporation, Orange and Rockland Utilities, Inc., Central Hudson Gas & Electric Corporation and Niagara Mohawk Power Corporation for determination of the accounting treatment and ratemaking principles applicable to the extraordinary property loss arising from regulatory rejection of Sterling Power Project Nuclear Unit No. 1, Phases I-A and II. (Opinion No. 82-1, issued January 12, 1982).

sunk cost associated with the project but not interest charges or a return on the investment.

The New York Commission was presented with a sharing proposal described as follows:

> "the four companies be permitted to amortize the sunk costs associated with the project, but that no interest or carrying charges or equity returns be allowed on the unamortized balance of those costs. The underlying premise of any proposal is that the losses should be borne by shareholders and ratepayers, in a manner that would reflect the benefit that each group would have received from a completed and operational Sterling plant."

And, according to the witness supporting this proposal,

> "the total benefit stream assuming a completed project probably accrues in very nearly equal proportions to ratepayers and shareholders in the long run. . . . A simple and expedient method for allocating the total costs of Sterling in a manner which approximates an equal sharing between ratepayers and shareholders is to permit recovery by the petitioning companies of the sunk costs of the project, but disallowing any costs of capital or return."

The New York Commission, after reviewing many of the same legal citations offered by the parties here, reaffirmed its "clear position in favor of full recovery - including related capital costs - of prudently incurred property losses...." (Case 27794, Opinion No. 82-1, p. 14 (mimeo)).

Most instructive for purposes here, the New York Commission rejected the idea that both ratepayers and shareholders would benefit equally from a completed plant, therefore they should share the costs of an abandoned plant. The Commission stated (mimeo, pp. 30-31):

> "Even assuming we were willing to resolve this case on the basis of an analysis of the comparative benefits to shareholders and ratepayers of a completed Sterling facility, we are unpersuaded that CPB's discussion and analysis of these benefits is

correct. For although its initial testimony pointed out the need for a rigorous analysis of these potential benefits, CPB did not attempt to provide it; its proposed equal sharing was based on a rough estimate of the benefits as it saw them. Petitioners' initial presentation was intended to provide the detailed analysis referred to by CPB, and although some of the values petitions assigned to the various costs and benefits may be disputable, their ultimate conclusion--that ratepayers would have been the primary beneficiaries of a completed Sterling facility--is sound. Given the fuel savings associated with the Sterling unit--which would have been passed through to ratepayers--and given the rather oppressive financial burden imposed on the companies in completing the facility, it is difficult to envision any benefits approaching those of the ratepayers. And to the extent that shareholders could have earned excess profits through operation of the Sterling unit, the presence of regulation insures that any such benefit would have been short-lived." (Emphasis added).

It would clearly be inequitable to require a sharing of the burden, when there would have been no sharing of the benefits.

The OCA's argument that part of the sunk cost incurred by the company should be ignored since the company resisted a Commission investigation into Limerick should be rejected. Specifically, OCA argues that "PECO's management, in opposing this investigation beginning in the Company Main Brief in early 1980 in R.I.D. 865... has assumed the risk of all sunk cost and other cancellation charge hence forth from that date, or, a reasonable date thereafter to account for hearing time." (OCA M.B., p. II-68). As PECO notes, the OCA is essentially accusing the Commission itself of imprudence since the Commission agreed with PECO that no investigation was required. Pa. P.U.C. v. PECO, Docket No. R-79060865, Order entered May 9, 1980, mimeo at 16-17.

OCA also argues that sunk costs need not be returned to investors in the event of termination because PECO's stockholders will accrue certain benefits from cancellation of the plant (OCA M.B., pp. II-32 to

II-37). This argument is based on the belief that if cancellation should occur, the dilution of common equity which has been created by the financing of the Limerick project will cease.

As PECO notes the first answer to this peculiar argument was provided by OCA witness Czahar who, on cross-examination, explained that under proper rate regulation, no dilution should occur during the construction of a project such as Limerick (Tr. 3503-3505):

Q. And that [assumed investor loss during Limerick construction] depends, does it not, upon the Commission's rate allowances and how effectively regulation combats the problems of attrition which have been experienced by electric companies in recent years?

A. Yes, sir; there is no doubt about it, and PECO is a good example, but so are a whole of of other utility companies who have simply been unable to earn the authorized rate of return; since those authorized rates of return are often lagged against market rates of return, we have a tremendous attrition problem with the regulation of electric utilities.

Q. In the revenue requirement levels on a present value basis though that you have stated in numbers I, II and III here, you have assumed that the company has, in fact, achieved the 16 percent return, have you not?

A. Yes, sir.

Q. And you have assumed that there is in fact no attrition; is that not correct?

A. Within a point or two of the market return, yes.

Q. So if, in fact, regulation was to function in the manner that you have assumed and was to successfully combat attrition within a point or two as you have assumed, would it not be the case that -- two things: one, there would be no loss to the shareholders from constructing Limerick because, in fact, the return has been earned, and two, the completion of Limerick as shown by Schedule E is still the economic option?

A. If both of those two hypotheticals are in place, then the answer is yes.

OCA also argues that the recovery of sunk cost should be denied because (OCA M.B., p. II-37):

> If one or both units are cancelled, PECO's current stockholders and potential buyers of PECO stock will respectively, have and perceive, less risk associated with PECO investments, as the risk that construction, licensing and TMI-outages presents to the stockholders is eliminated.

This second argument ignores the immediate market effect on the value of PECO's stock which would undoubtedly occur if PECO's investors were denied recovery of sunk cost. OCA witness Czahar agreed with an estimate of $1200 million as the present value of the after-tax loss which would necessarily be borne by stockholders in the event of denial of carrying costs alone.[23/] $1200 million represents approximately 70% of the company's existing common equity investment and, should such a loss be imposed, would immediately result in near complete elimination of the market value of PECO stock. This massive immediate loss in market value is a quantifiable catastrophe which would severely injure PECO investors and ultimately impose upon PECO and its customers the higher capital costs which would attend the higher risk that demonstration of this Commission's willingness to impose such losses would create.

As OCA witness Czahar stated (Tr. 2111-2113):

> Q. Am I correct, Mr. Czahar, that you are there being questioned by, again, I think the California Energy Commissioner with respect to the possibility that by cancelling a nuclear station a company's risk to

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23/ The carrying costs associated with Unit II investment alone have been estimated at $265 million (PECO Statement No. 15A, p. 4; Table 9).

investors would be reduced because it would not be involved in a nuclear construction program and therefore there would be a reduction in its cost of raising capital which would offset, to some degree, the extent of the increase in costs as a result of the cancellation? Is that a fair characterization?

A. Yes, sir.

Q. Am I correct that you indicate in your response -- and I would like to ask you to read it into the record -- that it's your view that while these effects may occur to some degree, they would not occur to a significiant decree as compared to the effects of cancelling the plant and requiring shareholders to absorb that lost investment?

A. Yes, sir.

Q. Would you read to me the two answers that you provide in response to the California Commissioner's questions on that particular transcript page?

A. Yes. "I think those esoteric differences would be overwhelmed by the fact that I have just lost half of my investment and I ain't going to do it no more."

Q. And I believe in that response, when you speak of "esoteric differences," you are speaking of the potentiality for the reduced cost of capital as the result of the utility not being involved in a nuclear construction program?

A. In comparison to the impact of writing off the entire cost against the utility's stockholders, yes.

Q. And I believe when you say, "I ain't going to do it no more," you refer to not making similar investments in utility capital?

A. Oh, I wouldn't do it. I don't see any reason why anybody else would in the future.

For the foregoing reasons, it appears obvious that ignoring prudently incurred sunk costs and the return on those costs is not in the public interest.

Another area of disagreement concerns whether the costs and benefits of Limerick and the alternatives should be considered over the 35 year expected life of Limerick or over some shorter period.

PECO's position was set forth by its witness Dr. Perl (PECO Statement No. 12, pp. 6-7):

> Whatever generating alternative is constructed, the cost to consumers will vary from year to year. The capital charges for any facility tend to be high in the initial years and to fall over the life of the plant. On the other hand, with inflation, fuel charges tend to rise steadily over the life of the plant. In addition, while we are assuming that both Limerick and its alternative would be used as a means of base load generation, the availability factor, which determines the amount of generation that can be derived from these units, will vary from year to year. Consequently, it is inappropriate to make comparisons between these facilities based upon costs in any one year. A facility that is cheapest in the initial years may be most expensive over the long-run and vice versa.

OCA witness Dr. Rosen measured the costs and benefits of Limerick over the period 1980 to 1999. Dr. Rosen stated (OCA Statement No. 1, pp. 25-26):

> In my opinion relative energy prices and O&M expenses for different types of power plants are hard to predict; after the mid-1990's substantial uncertainty develops as to what these values will be. For instance, the rapid historical rate of increase in nuclear O&M costs that we have found (see Appendix D) may continue in a pattern closer to an exponential rate of growth than to the linear real dollar rate of growth that we have assumed in this study. Thus nuclear plants may begin to break down so frequently and be so clostly to operate and maintain that their effective economic lifetimes may be only 15 to 20 years, rather than the expected 30-35 years. Similarly, coal or oil prices may grow faster or slower than those projected here.
>
> Beyond the mid-1990's and beyond the on-line dates for plants which must be decided to be constructed within the next few years, the degree of uncertainty

grows so substantially that meaningful planning cannot be carried out. Thus I believe that it would be unreasonable and unsound public policy to recommend a particular power plant construction program which we are quite sure would cost ratepayers considerable extra expense through 1999 compared to an alternative that might only hypothetically save money beyond 1999. While this approach to policy making may be claimed to invove an intrinsic bias against constructing nuclear power plants, we must recognize that building such facilities involves considerable additional financial risk and uncertainty even in the short run, not to speak of beyond 20 years from now.

Dr. Kahn used a 8 to 10 year period while the City's analysis ends in 1990.

While it is true that the costs and benefits occurring in the later years of plant life are less certain than those which occur earlier in the same plant's life cycle, as PECO points out, the relative uncertainty of these distant benefits and costs is recognized by means of the discount rate. Accordingly, that benefit or cost is accorded less value in the analysis than are nearer-term benefits and costs. However, there can be no doubt that a benefit (or detriment) exists and, if a proper cost benefit analysis is to be undertaken, it cannot be ignored.

The shortened period of analysis used by OCA and other parties essentially ignores the benefits and costs occurring over the latter half or more of Limerick's life. This approach, rather than recognizing the uncertainty of such quantifications, in fact, assigns a zero value to the costs and benefits of the post-analysis period.

It also seriously distorts measurement of the relative costs and benefits of completing or terminating the Limerick project. Nuclear plants have generally a higher intitial costs, but lower running costs than have coal plants or other fossil fuel alternatives. As a result,

utilities invest in nuclear plants in the belief that future savings will more than make up for high initial costs. Regulatory accounting practices further exacerbate the bias inherent in a truncated analysis. As explained by PECO's witness Dr. Hieronymus (PECO Statment No. 15, pp. 13):

> Regulatory accounting practices worsen the truncation bias against high initial cost, low variable cost plants. Fuel and other variable costs grow due to inflation. Conversely, return and associated taxes decline as the plant is depreciated. For regulated utilities, therefore, it is particularly important to include the full life of the plant in the period of analysis if economically rational decisions are to be made.

The company's position was further supported by the decision of Administrative Law Judge Robert L. Shankland of the Michigan Public Service Commission. There he rejected Dr. Rosen's "truncation approach" presented in a Consumers Power Company securities proceeding as a part of Dr. Rosen's analysis demonstrating the economics of cancellation of the Midland Nuclear Power Plant. ALJ Shankland stated (Proposal for Decision, Case NO. U-6360, May 21, 1981, p. 43):

> As pointed out previously, Dr. Rosen terminated his study in 1995. The premature truncating of his study results in a substantial bias against the Midland alternative. The undervaluation of such Midland benefits as lower energy production costs, occurs from the implicit assumption that there would be zero cost savings after the termination date of the study. In Dr. Rosen's analysis a substantial difference between coal and nuclear fuel costs per kwh exists in the mid-1990's. Even if coal and nuclear fuel have the same escalation rates, as assumed by Dr. Rosen from Mr. Kumar's input, the fuel cost disadvantage of the coal alternative will continue to grow after 1995. Therefore, it is unreasonable to assume zero net savings from the Midland alternative after 1995.

The OCA seems to argue in this brief (OCA M.B., pp. IV-27) that, on the basis of the record in R.I.D. 438 and R-79060865, PECO has in the past supported shorter nuclear plant lives than the 35 years used in its analysis here.

The Commission has established a 35-year life expectancy of a nuclear plant such as Limerick (R.I.D. 438, Order entered February 5, 1979, mimeo, p. 26). As PECO points out, it is interesting to note that in that same proceeding, the OCA argued for a 35 to 40 year life for a nuclear plant.

A third methodological dispute was the appropriate discount rate to be used in weighing the costs/benefits of Limerick and the proposed alternatives. In assessing net cost or benefit of Limerick completion, Dr. Perl employed PECO's after-tax incremental cost of money as the appropriate discount rate. The rate employed was 8.58% (PECO Statement 12B, pp. 17-18). OCA witnesses Rosen and Czahar employ a discount rate of 14.7%, which equals their assumption of PECO's pre-tax cost of incremental capital (OCA Statement 2c, p. 8). To some extent, the difference in these discount rates is attributable to the varying assumptions made by PECO and the OCA about long-run inflation and capital attraction costs. However, approximately one-half of the difference is due to a disagreement over whether the discount rate employed should be pre- or post-tax.

OCA witness Czahar criticized the PECO rate for two reasons (OCA Statement No. 2A, p. 10):

> First of all, the marginal cost of funds and not the embedded cost, is by definition the appropriate starting point in estimating a discount rate that has the stated goal of measuring the present worth

of alternative future investment choices. Further, in comparing revenue requirements from the standpoint of the consumer, it seems unrealistic that a large percentage of ratepayers who face retail credit rates of between 18% and 22% would in the case of their electric bills use a discount rate of 8.58% to evaluate their preferences for one stream of revenue requirements over another.

Finally, to the extent that there is a benefit to ratepayers of debt financing, as implied by Dr. Perl's use of an "after-tax" discount rate, this benefit is merely that ratepayers pay only $1 in revenue requirement for every dollar of debt interest, rather than the $2 they must pay for every dollar of equity return. Certainly, the ratepayer would not discount the value of his revenue requirement for debt interest by 50%, as apparently claimed by Dr. Perl.

It appears, however, that the OCA witness misspoke when he claimed that Dr. Perl did not use an incremental cost of capital. As Dr. Perl explained, although his costs are lower than those used by Mr. Czahar, due to a lower assumption as to long-term inflation rates than that made by the OCA, they are incremental costs. To the extent that these differences are related only to variations in the rate of inflation, they will not change the real cost of either coal or nuclear plants or the present value of gains to consumers from completing Limerick. As explained by Dr. Perl (PECO Statement No. 12B, pp. 16-17), while increased costs of money will affect nuclear more than coal, increased inflation will affect coal more than nuclear and the effect will be offsetting.

With respect to whether a pre-or after-tax discount rate should be used, this comes down to the question of whether the cost of money to the utility as opposed to the consumer should be used in these calculations.

The company's position, that the former is correct, appears more reasonable.

In building and operating electric generating plants, a utility essentially functions as a financial intermediary, borrowing money from investors and loaning it to consumers. As long as the rate at which the utility can borrow is below the consumer's own discount rate, alternative investment programs should be evaluated at the cost of money to the utility.

While OCA witnesses Rosen and Czahar have correctly selected the weighted average cost of money to PECO to evaluate the gains and losses to consumers, they have ignored the fact that since interest charges are tax deductible, the effect of taxes must be taken into account in calculating the effective cost to consumers of utility borrowing. (PECO Statement 12A, pp. 1-2).

Another dispute concerns the issue of tax normalization. The OCA assumes in its Limerick cancellation scenarios that the sunk costs of Limerick will be taken as a tax loss in the year in plant is cancelled, that the loss will be flowed through to customers as rapidly as available income will permit, and that sunk cost recovery will be permitted by amortization to rates in equal installments over a ten year period (OCA Statement No. 2, pp. 14-16).

By taking the sunk cost of Limerick as a tax loss in the year the plant is cancelled, the total income tax deduction is available to reduce income taxes in the early years following cancellation. This significantly reduces revenue requirements in these years by avoidance of income tax payments, which, however, must be made by future customers (OCA Statement No. 2, p. 15). Because the OCA employs a present value analysis, tax savings achieved early, though repaid in later years, have

a greater present value than would otherwise be the case if the tax loss were deducted ratably over the amortization period.

I agree with PECO that Mr. Czahar's plan to amortize the sunk costs of Limerick to rates over a ten year period, but on the other hand, to declare a loss in the year Limerick is cancelled with as rapid a loss carry-forward flowed through to customer rates as income will allow, is in conflict with the well established regulatory and accounting principle that customers who bear an expense should also receive the tax deduction associated with that expense. Under Mr. Czahar's proposal, the sunk costs of Limerick will be recovered over the ten year amortization period from future ratepayers who will not receive the tax benefits from the abandonment loss whose cost they are required to bear. In fact, under Mr. Czahar's proposal, those customers must bear both the amortization expense itself and a tax expense of equal amount which arises due to the early use of the tax deduction as the result of flow-through. This is questionable from an accounting perspective as it assigns the cost and its associated tax effects to different accounting periods (PECO Statement No. 17, p. 8). Accordingly, normalization accounting should be employed. See, e.g., Re Public Service Electric & Gas Co., Docket No. 794-310 (N.J. Bd. of Pub. Utilities April 11, 1980); Re Virginia Electric & Power Co., 29 PUR4th 65 (Va. St. Corp. Comm. 1979).

Having discussed the various methodological disputes, it is now time to turn to the specific criticisms of PECO analyses.

Perhaps the most extensive criticisms of PECO's presentation are that PECO failed to examine conservation as an alternative to Limerick and that PECO failed to present sufficient sensitivity analyses.

In addition, the various assumptions used by Mr. Lawrence and Dr. Perl have been critized as unreasonable.

With respect to its failure to consider conservation as an alternative to Limerick to company makes two responses. First, it states, both Dr. Perl and Mr. Lawrence have considered the effect of conservation. It cites Dr. Perl's testimony where he states:

> [T]he criticism is not valid.... Since the entire Limerick plant is economically advantageous when load growth is reduced to 0.5% per year, it is not necessary to explicitly examine trade-offs between investments in conservation and investments in Limerick. Since it is unlikely that economic investments in conservation could reduce load growth for PJM to as low as 1.5% per year and even more improbable that these investments could eliminate growth, Limerick would remain economic even if all such investments were made.

Similarly, it notes, Mr. Lawrence testified that his study includes an analysis of the economics of Limerick at PECO growth rates of 0% and 1.1% and a PJM growth rate of 1.7%. Mr. Lawrence, stated even "[i]f one assumes that conservation could reduce the Company's sales growth to zero, one can see by examining Schedule that both Limerick units are still economic." (PECO St. No. 11C. p. 4).

Secondly, it argues that it has considered the cost effectiveness of a utility financed conservation program as proposed by the OCA and others as an alternative to Limerick in the testimony of Dr. Hieronymus (PECO Statement NO. 15A), Mr. Hoch (PECO Statement 3A) and others. The dispute seems to be with the company's conclusions as to the cost effectiveness of these programs and not as to whether conservation was actually studied.

The OCA argues that PECO failed to consider several potential least cost alternatives to Limerick. While PECO argues that, when

viewed in its totality, its evidentiary presentation fully responds to these criticisms, it should also be noted that the OCA presented no sensitivity analyses with respect to its own position. There are hundreds, if not thousands, of different permutations and combinations that could be analyzed and, it is true, PECO did not do every one. But the question properly is, does the record here analyze a reasonable selection of these probable combinations, and the answer is in the affirmative.

With respect to specific criticism of the analyses of Mr. Lawrence and Dr. Perl, these fall within the general catagories of Limerick and coal plant construction cost, nuclear and coal capacity factors, nuclear and coal operating and maintenance costs, load growth projections and cost of capital.

We have previously discussed the various cost estimates presented on the record. It appears that the Cresap forecast is the most reasonable. Precision, however, is not required in this area, however, since as shown earlier in this decision, even employing the OCA'S financial assumptions, it would require a plant cost of $6.97 billion and $6.6 billion to eliminate the Limerick facility from the most economic capacity mix, even at PECO and PJM growth rates of 1.1/-0.5% and 1.47/1.22% respectively.

The company has assumed a 70% capacity factor for Limerick. PECO notes that it has analyzed the economics of Limerick completion using its expected 70% capacity factor, a 60% capacity factor which approximates the value proposed by opposing parties as a "sensitivity" analysis and a 61% levelized capacity factor. This "levelized" capacity factor assumption was employed by Dr. Perl in his life cycle analysis estimated greater than a 60% capacity factor in early years of operation

and less than 50% in later years (PECO Statement No. 12, pp. 8-9).

Regardless of which capacity factor is used, PECO notes, these analyses demonstrate that Limerick continues to be the preferred generation alternative.

OCA witness Rosen criticized the company choice of a 70% capacity factor and employed a 58% factor in his analysis. He based this decision on the average life-time capacity factors for large boiling water reactor (BWR) plants (over 800 MW) of 55%, the unweighted experienced life-time capacity factors of Salem (a pressured water reactor (PWR)) and Peach Bottom 2 & 3 of 57.7%, and the life-time capacity factors for BWR plants of over 600 MW of 57%.

PECO supports its 70% Limerick capacity factor expectation on the basis of the experience in operation of the Peach Bottom Station. Peach Bottom Units 2 and 3, like Limerick, were constructed by Bechtel and employ a General Electric BWR nuclear steam supply system. Both reactors have operated for about seven years. The average capacity factor of these units in the past three years of service (1978-1980) equals 72.9% (PECO Statement No. 1D, Table A). The lifetime average of Unit 2 is 63.4% and of Unit 3 is 66.9% (PECO Statement 1B, p. 16). The recent performance of these units thus exceeds the 70% Limerick expectation. PECO notes that even the somewhat lower lifetime capacity factors exceed witness Rosen's 58% assumption.

Further, PECO argues, Limerick should experience a higher capacity factor than Peach Bottom for a variety of reasons. First, Peach Bottom experienced a number of outages in order to retrofit the reactors with design and equipment modifications. Such outages will not be necessary at Limerick as those modifications have been incorporated

during the plant's construction. As Mr. Boyer testified, if the most significant of the retrofitting outages were subtracted from the operating history of Peach Bottom, the resulting lifetime capacity factors would have been 73% and 72% for Units 2 and 3 respectively (PECO Statement 1B, p. 17; Cons. Exh. 1, IR-2, 9-8). In addition to these retrofitting outages, Peach Bottom experienced refueling outages under the 12-month refueling cycle in effect during the early years of its operation. Limerick's refueling, by contrast, will be at 18-month intervals which will increase its availability compared to that of Peach Bottom. Finally, the construction of Limerick has benefitted from a more sophisticated quality assurance program than was used during much of the construction of Peach Bottom, as well as an improved level of technology in the design and specifications of the plant (PECO Statement No. 1B, p. 18).

PECO also argues that, in addition to the Peach Bottom experience, the operating history of mature, large BWRs (800 MW or greater) further supports PECO's estimate of a 70% capacity factor. Four such reactors -- Peach Bottom 2 and 3 and Browns Ferry 1 and 2 -- have been in operation for at least six years, and each has about three years of mature operation beyond the initial three year shakedown period. In the last three years of mature operation (1978-1980) these four units have achieved an average capacity factor slightly in excess of 70%. (PECO Statement 1D, p. 6 and Table A). According to PECO a substantially similar result is obtained when more extensive data is analyzed: the mature 1978-1980 capacity factors of BWR units sized in excess of 600 MW (12 units) equalled 68.1%.

According to PECO, Dr. Rosen underestimated Limerick's potential capacity factor because the data he used reflects historic operating

practice, now changed, with respect to 12-month refueling outages and changes in nuclear fuel technology, retrofitting outages arising from TMI and other related design and equipment modifications not anticipated at Limerick. In addition, this data reflected the initial operation of the first generation of large nuclear reactors which would not have the benefit of the improved quality assurance programs and prior operating experience which will enhance Limerick's performance (PECO Statement No. 1C, pp. 7-8).

Finally, Mr. Boyer, testified recent changes in nuclear fuel technology and maintenance practices should give rise to increased nuclear capacity factors as compared to those in the past data. He stated testified (PECO Statement 1C, pp. 6-8):

> I believed that the historic capacity factor data for nuclear units used by Dr. Rosen cannot be used without adjustment to predict future nuclear capacity factors, and that after such adjustment the historic data supports our capacity factor estimate.
>
> For example, the historic data cited by Dr. Rosen was based on a 12-month refueling schedule. The Company, like the majority of other utilities, has shifted to an 18-month schedule which will reduce the number of outages and increase the availability of nuclear plants. Because only two refueling outages are required n a three year period rather than the three outages under the previous schedule, the average capacity factor should increase over the historic data by 3-4%.
>
> In addition, over the past few years General Electric has made improvements in the fuel and core design and recommendations for the method of operating the core which have resulted in increases in the capacity factor of boiling water reactors. Limerick will begin operation with these inherent advantages.... The net result of these changes offers a 4% improvement in the capacity factor.

OCA notes that the company's capacity factors assume that Limerick's actual power production (as measured by its maximum dependable

capacity [MDC]), will equal its 2110 megawatt design capacity (as measured by its design electric rating [DER]) (Tr. 1140). In fact, as acknowledged by Mr. Boyer, (Tr. 1137) the design electric rating is generally higher than the actual maximum output that can be expected. Thus, Dr. Rosen argues, even if Limerick does operate at 70% of its maximum dependable capacity, this would probably result in a somewhat lower capacity factor when measured against the full 2110 megawatt design rating that he used in this proceeding. Peach Bottom Unit 3, for example, has a DER capacity factor of 62.6% through 1979, compared with an MDC capacity factor of 64.4% (Tr. 1139).

OCA notes that both Mr. Boyer and Dr. Perl used the higher than average capacity factors at the Peach Bottom plants as evidence that Limerick will operate at even higher capacity factors. (PECO Statement No. 1B, p. 17; PECO Statement No. 12B, p. 22). It notes that any expertise in operating Peach Bottom does not seem to have transferred to the Salem No. 1 plant (which is owned in part, but not operated by PECO) and which has operated at a 43.1% capacity factor through 1980. (OCA Exhibit No. 20, Tr-2, 29). Nor did the rather successful Three Mile Island Unit No. 1 operation serve as a valid predictor of the near zero capacity factor at Three Mile Island Unit No. 2 (Tr. 3310). Before any comparison is made, however, it must be remembered that both Salem and TMI use pressured water reactors, not boiling water reactors like Limerick and Peach Bottom.

It appears that the 70% factor assumed for Limerick is optimistic, although based on the recent history of Peach Bottom Units 2 and 3, it is by no means unachievable, especially in view of the reduced refueling schedule and recent improvements in fuel and core design. Its

use in PECO's calculations cannot be termed unreasonable, arbitrary or unsupported by the record.

PECO's estimates of nonfuel operating and maintenance costs at Limerick for the years 1985-1994 range from $133 million for the two units in 1988 to $192 million in 1994. The basis for these estimates are experienced Peach Bottom O&M costs, escalated by an assumed general inflation rate of 7%.

OCA criticizes this approach and recommends instead use of Dr. Rosen's methodology. He used a regression analysis of experienced nuclear plant non-fuel O&M expenses during the period 1970-79. His expense level is considerably higher than PECO's. For example, in 1994, he estimates these expenses at $448 million compared with the company's estimate of $192 million (OCA Statement No. 1, pp. 37-38).

PECO presented two witnesses critical of the OCA approach. Dr. Hieronymus testified that Dr. Rosen's O&M forecasting approach does not use sufficient data for a reliable forcast. Approximately 80% of the information is from the years 1974-1979. According to PECO's witness, it is simply unreasonable to forcast a high rate of escalation over the next twenty years based on nothin more than a five year trend. Moreover, the climate of rapidly increasing safety-related operating requirements present in those years may not be at all representative of the future (PECO Statement No. 15, p. 74). In addition, the analysis does not give any indication as to what is causing the increase. As Dr. Hieronymus testified (OCA Statement No. 15, p. 77):

> ....Unless causation is reasonably well established, basing forecast upon regression results is a meaningless exercise which assumes that all of the relationships among O&M costs, their actual causes and the time trend variables in the regression will remain exactly as they were during the observed historical period.

Furthermore, Dr. Rosen's data base includes data for demonstration plants and first year costs which may be unrepresentative.

PECO witness Martin J. McCormick, Jr., Superintendent of the Services Division of its Electric Production Department, testified also that Dr. Rosen's cost forecasting approach produced unreasonable results. As explained by Mr. McCormick (PECO Statment No. 16, pp. 4-7):

> ... Dr. Rosen performed a statistical analysis of the 1970-1979 operating and maintenance expenses at certain nuclear power plant in this country. Based on this analysis, Dr. Rosen has concluded that, even after adjustment to eliminate the effects of inflation, operating and maintenance expenses at nuclear plants in general, and at Limerick in particular, will rise at the rate of approximately $1.9155/kw per year in 1978 dollars every year for the life of the plant. At Limerick, this projection results in an average yearly real cost increase of approximately $2 million anticipated for each unit.... Operating and maintenance expenditures at the level predicted by Dr. Rosen produce unrealistic results from the point of view of practical station operations. For example, in 1999, Dr. Rosen's Limerick O&M Cost Projection (2 units) is $699,360,000.
>
> Applying the Company's experienced 60% ratio of labor expense to total O&M expense and a projected wage rate based on the Company's 1981 man-hour rate escalated by Dr. Rosen's 9% inflation factor, the table below indicates that the Company would have to employ 1,986 men for 365 days per year at Limerick in order to spend the labor dollars predicted by Dr. Rosen.... This projection of approximately 2,000 men/day is extremely significant in view of the fact that the permanent station staff for Limerick will be about 597 persons....
>
> The work force requirement indicated by either the "year round" or "outage only" analysis is physically unrealistic. Moreover, past experience during numerous major unit outages at our Peach Bottom Nuclear Generating Station, which is a boiling water reactor similar to Limerick, indicates an average weekday required total work force of approximately 1,400 person/day during a major outage. Further, this complement is much reduced on weekends, reaches this peak only during the height of the outage and is significantly lower during the first and last months of the outage.

While Dr. Rosen has testified that the likelihood of additional NRC safety related requirements and costs associated with plant component failure as plants grow older may cause expense esclation (OCA Statement No. 1A, pp. 33-35), this is just an assumption. Dr. Rosen has testified elsewhere (OCA Statement No. 1, p. 34) that plant age and the reactor maufacturer did not have a significant statistical association with O&M costs.

It appears, therefore, that the company's estimate of future costs is reasonable -- at least no better one has appeared on this record.

Forecasts of PECO and PJM Interconnection which compound annual kwh load growth for the 1980-2000 period have been submitted by the company and various parties. Forecasts submitted of future company loads inlcude PECO's forecast of 2.3%, Wharton Econometric Forecasting Associates (WEFA) "econometric" forecast of PECO load growth of 2.8%, and an OCA forecast prepared by Dr. John K. Stutz of 1.1%. For PJM the agregate forecast of the member companies for the 1980-2000 period equals approximately 2.6%. PECO witness Dr. Lewis J. Perl presented an "econometric" forecast prepared by National Economic Research Associates (NERA) of 3.39% while Dr. Stutz proposed the employment of 1.7% PJM growth rate based upon historic growth for the 1973-1979 period.

PECO forecast of 2.3% the result of an annual study by the company's Technical Services Department (PECO Statement No. 3, pp. 1-3). This forecast is based on trend analysis, correlation analysis with regressions, economic projections, technological forecasting of changes in energy-using equipment, and data derived from a regional economic model (PECO Statement No. 3, PP. 4-5; PECO Exh. WCH-1).

The assumption which are employed in this forecast include estimates of population based upon an assumed growth rate of approximately 0% between 1980 and 2000, which PECO point out is well below Bureau of Census estimates (PECO Statement No. 3C, p. 12). PECO states that its forecast assumes that significant conservation efforts will continue and will be encouraged by government agencies and private organizations. Residential customers are expected to employ solid state appliances, full insulation levels, high efficiency air conditioning, accelerated acceptance of heat pumps with continually improving efficiency ratings and microwave ovens (PECO Statement 3A, pp. 12-14; PECO Statement 3B, p. 2). New commercial buildings are projected to be built to ASHRAE 90-75 standards, and conservation in industrial usage is expected to continue the trends experienced since 1973 (PECO Statement No. 3A, p. 31). The forecast PECO states is in line both with regional and national forecasts of electric usage growth (Electrical World 3.8%; Exxon 2.5%) (PECO Statement No. 3, p. 15; PECO Statement No. 3C, pp. 3-5).

The WEFA econometric forecast of PECO future load growth of 2.8% is developed modeling the structure of PECO service territory economic and other factors affecting electric usage, analyzing data as to the likely future value of such usage level determinative factors, and inserting the developed likely factor values into the model to determine anticipated future load levels.

PECO states that the PJM forecast compound annual growth of 2.6% for the 1980-2000 period is a composite, the result of aggregation of each of the member utilities; estimates of load growth. PJM members' forecasts are the product of each utility's study and are relied upon for generation planning by both the individual PJM members and PJM

itself (Consol. Exh. 1, IR-2, 14-4; PECO Statement No. 11H, p. 11). A PJM forecast prepared by NERA projecting growth in PJM future loads of 3.39% was also presented by PECO witness Dr. Perl. NERA's forecasting methodology consists of the development of an econometric data base, analysis of factors which affect electicity usage and the development of a model reflecting the structure and interrelationships of such factors, analysis of data relevant to predicting the future value of the identified factors and insertion of the predicted factor values into the model to obtain anticipated future load levels (Consol. Exh. 1, IR-2, 17-23).

According to the witness, NERA's forecasting approach is "end-use" in the residential sector where adequate data is available, industry specific in the industrial sector where "end-use" application data is unavailable and, as detailed as the limited commercial sector data will permit, for this sales category.

In addition to the above-described forecasts, PECO attempted to support its forecasted PECO/PJM load growth rates with analyses of historic load growth. First, PECO witness Hoch examined the recent history of PECO and PJM load growth with the following result (PECO Statement No. 3A, p. 2).

> During the decade 1970 and 1980, PECO and the PJM experienced a compound annual kwh growth rate of 1.9% and 3.0% respectively. From 1975-1980, a period which fully covers the effects of the late 1973 Arab oil embargo, increasing real electric prices and the conservation consciousness which has arisen since the embargo, PECO and PJM load growth has been at a compound annual kwh growth of 1.7% and 2.9%.

Similarly, Dr. Perl presented historic data of load growth in the PJM area during the period 1976-1979 which demonstrated that such growth equalled a 3.06% rate as compared which NERA's 3.39% forecast (PECO Statement No. 12B, p. 18). PECO claims that historic PJM and PECO growth rates, despite extremely negative economic conditions and disruptive energy price increases, are consistent with PECO's proposal that the Commission adopt a 2%/2.5% PECO and PJM energy growth rate as being the minimum prudent load growth for use in this proceeding.

PECO further attempted to support its position that its forecast growth rates are conservative as compared to the historic data when changes in economic conditions and in the anticipated growth rate of real electricity prices are considered. It cites testimony by Dr. Perl (PECO Statement No. 12A, pp. 6-7):

> In attempting to evaluate the realism of the Rosen-Czahar growth forecasts, it is worth noting that over the period 1970 to 1980, electricity charges by Philadelphia Electric (including the effect of the fuel adjustment clause) have risen at an average annual rate of 13.5%. Over the same period, inflation has risen at 6.9% per year. Thus, in constant dollars, electricity prices in the PECO service territory has risen at 6.2% per year. Despite this dramatic increase in price, growth in electricity as forecast by Rosen and Czahar falls by 0.1% per year from 1980 to 1990 and 0.9% per year from 1990 to 1999. In this context, it seems implausible that electricity demand growth for PECO will slow as significantly as forecast by Rosen and Czahar over this period.

In contrast to PECO's estimate the OCA presented as its load forecasts the "State Base Case Forecast" and "the State Conservation Policy Case" prepared by Dr. John K. Stutz of ESRG, Inc. As noted earlier these forecasts were initially prepared in 1979 for use in Docket No. R-79060865. The projected growth rate for PECO for the

period 1979 through 2000 is set forth in the "base case" equals 1.1% and -0.5% in the "Conservation Scenario." In his rebuttal testimony, OCA witness Stutz further proposed adoption of the historic PJM growth rate of 1.7% for the period 1973-1980 as the expected rate for the post-1980 future (OCA Statement No. 3, p. 48).

Witness Stutz testified that certain component elements of his 1979 "base case" forecast are in error: based on the current economic recession his industrial forecast is overstated, while in light of PECO's current commercial sales his commercial forecast is understated. However, on an overall basis, Dr. Stutz asserts, his total forecast level should be employed in this proceeding (OCA Statement No. 3A, pp. 5-6 & 25-27). The areas of disagreement center around use of historical data and the specific effects of conservation on future load growth.

While acknowledging that an upward revision to the commercial sector and a downward revision to the industrial sector should be made, Dr. Stutz reiterated the reasonableness of the 1979 ESRG forecast, the rationale for its continued acceptability, as contrasted to the current PECO forecast and the relevance of these changes to this proceeding (OCA Statement No. 3, pp. 38-39):

> My continued acceptance is based on two points. First, the extremely accurate aggregate performance of the ESRG Base Case forecast over the past three years, and second, the extent to which the forecast, in the aggregate, continues to represent the conditions underlying future growth in the PECO service territory.
>
> ****
>
> For purpose of this proceeding, one is only interested in the aggregate growth in energy and peak demand. The sectoral composition of the growth is irrelevant in a generation planning study such as

Dr. Rosen's. Thus, based on my analysis I recommend that Dr. Rosen continue to use the ESRG Base Case forecast growth rates in his studies.

A comparison of the ESRG Base Case estimates and actual results is shown below:

Comparison of ESRG and Actual Data

Year	Energy ESRG	Energy Actual (1)	Energy % Diff.	Peak ESRG	Peak Actual (2)	Peak % Diff.
1978	28690	29487	-2.7	5670	5630	+.7
1979	29190	29595	-1.3	5740	5740	0
1980	29650	29726	-.3	5820	5810	+.2

(1) Annual Output (ESRG data includes losses)
(2) Standard Demand (PECO weather normalized)
OCA Statement No. 3, Exh. JS-7, Schedule A.

PECO witness Hoch, however, was unimpressed (PECO Statement No. 3C, pp. 2-3):

> [A]s is more fully described in our discussion of ranges of actual load experience in Ex. WCH-1, page 1, actual sales vary as the result of numerous conditions. Sales forecasts are made on a normalized basis. Accordingly, the fact that ESRG forecasted sales over a limited 3-year period are 'reasonably consistent' with actual sales is more likely the result of coincidence than any special insight upon the part of ESRG. The accuracy or inaccuracy of a long-term forecast can be observed only over a extended period of time.
>
> Of greater importance, however, the reasons for the 'consistency' of ESRG forecasted and experienced 1980 energy sales are not hard to determine and provide no support for the long-term accuracy of the ESRG Base Forecast. As shown on Ex. JS-7, Sch. A, the ESRG Forecast underestimated PECO actual energy sales in 1978 by -2.7%, in 1979 by -1.3%, and in 1980 by -.3%. As I have previously described, in 1979 and especially 1980 were years of decreasing economic activity and in fact recession. Under more normal economic conditions, which are the usual basis of long-term forecasting, the ESRG Base Case Forecast is likely to understate actual energy sales levels.

Similarly, Dr. Perl also advised against use of short-term data as an accurate measurement of long-term forecast accuracy (PECO Statement No. 12B, pp. 18-20).

The OCA claims that PECO's projected level of conservation in its forecast is based on inadequate information (OCA M.B., pp. III-2, III-4). Specifically, the OCA seems to claim that many of the studies relied on are essentially interviews with homeowners and are not reliable. But, as PECO points out, this survey was not used exclusively in projecting conservation, it was simply one of many inputs upon which the final projection is based.

With respect to heating load conservation, the OCA claims there is no documented evidence to support PECO claim that 50% of new space heating would be done electrically and that a 1% growth in the commercial sector could be expected. PECO argues, however, that review of its forecast (PECO Exh. WCH-1) reveals substantial support for its assumptions. Between 1977 and 1980 PECO has experienced electric space heating growth of new large commerical customers of 61%, 52% and 51% respectively (PECO Exh. WCH-1, p. 190). In the small commercial sector, the company has been experiencing electric heat saturation of approximately 70% but assumes only a 40% saturation in its forecasts (PECO Exh. WCH-1, p. 191). Based on this experienced data, it claims, the space heating penetration is, if anything, conservative. PECO argues that its 1% growth projected in existing commercial load is also supported on this record. PECO cites two studies that support its view that commercial load will continue to grow at the 1% level (PECO Ex. WCH-1, p. 197) with most of the increase resulting from data processing equipment which is the single most influential element in determining a building's use of electricity.

The OCA argues that PECO's forecast estimates future consumption in each of its ten large industrial customers on an individual basis. OCA criticized this as being an inaccurate way to forecast long-term trends. Similarly, the OCA criticized PECO's commercial forecast methodology. According to Dr. Stutz PECO projects continued and continuous growth in commercial square footage on the basis of the current building boom. This, he argues, is cyclical in nature. OCA criticizes PECO's residential electric space heating penetration expectation of 55-60% as being in error in that it is too high, improperly lacks a supporting econometric analysis and improperly assumes high alternate prices of fuel (OCA M.B., p. III-15). OCA asserts that PECO's forecast should be in line with ESRG's which averages only approximately 45% to 50%. As noted by Mr. Hoch, PECO's long term penetration of electric heating in new construction is conservative in light of recent experience, which far exceed ESRG estimates (PECO Statment No. 3b, p. 3):

> Since 1978 and through the first five months of 1981, the average annual percentage penetration of electric heat in new residential construction has been between 60 and 70% for single family construction and 68 and 77% for multi-family construction. Moreover, not since 1972 and 1973, prior to the Arab oil embargo, have we experienced electric heat penetration in new construction as low as those assumed by ESRG in their low forecast (i.e., saturations of 30%).

PECO notes that OCA's criticism that its penetration assumptions are not based on a econometric analysis is quite puzzling since its witness, Dr. Stutz, vigorously opposes employment of such techniques and does not use them either in his penetration analysis (OCA Statement No. 3b, p. 13). In addition, OCA argues that PECO fails to project application

of insulation standards which may be expected to significantly decrease consumption of electricity (OCA M.B., P. III-18). The ESRG building envelope quality standards, however, and lower than those which PECO projects in new residential construction (PECO Statement 3B, p. 12). Finally, OCA appears to argue that PECO's load forecast should be discarded since the merits of the two forecasts have been fully litigated by the parties in R.I.D. 865--both the OCA and PECO presented testimony and analysis as well as extensively arguing the relative merits of the two forecasts during briefing. The Commission made a determination that the ESRG results and methodology were preferred to the PECO results and methodology.

PECO argues, however, that if it were not for the current recession, which neither national nor regional economists expect to continue indefinitely and upon which it would clearly be imprudent to base any long range forecast, the Stutz forecast would seriously underestimate load growth (PECO Statement No. 3C, pp. 2-3). 24/

PECO also rejects the OCA assertion that the ESRG forecasting methodology was adopted in a prior Commission decision and that such adoption should be "reaffirmed in this proceeding." This argument should be rejected for several reasons. First, the OCA's argument

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24/ OCA cites the petition of Lukens Steel to transfer from PECO to PP&L as an indication of future reduced load (OCA M.B., P. III-25). PECO points out, however, that the load would remain in the PJM system, contribute to its growth rate, and thus the economics of Limerick (PECO R.B., p. 63).

misconstrues the Commission's Docket No. R-79060865 finding and ignores intervening events. At Docket No. R-79060865, the Commission found that:

> [T]he Stutz methodology more adequately addresses and quantifies these changes. Therefore, we find that the load forecast prepared by Dr. Stutz more accurately reflects the level of capacity needed for the period of time the rate level approved in this Order will be in effect.

Given current inflation, such rates usually remain in effect for no more than two years. In fact, the rates established by the Commission's May 9, 1980 order at Docket No. R-79060865 were replaced by new rates adopted pursuant to the Commission's Order at Docket No. R-80061225 after approximately one year. The Commission's finding was limited to "the period of time the rate level approved" at Docket No. R-79060865 "will be in effect." In fact, the only Stutz load projection employed by the Commission in its rate base adjustment was that for the year 1981.

Second, the Commission's finding is merely that the Stutz forecast is "more adequate" or "more accurate" (in 1981 only) than the PECO 1979 forecast at issue at Docket No. R-79060865. This, PECO argues, says nothing with respect to the relative accuracy of the PECO 1981 forecast or of the effects of load growth, changed economic or other conditions on anticipated future load levels since the close of the record at Docket No. R-79060865. Moreover, the OCA argument ignores the fact that the Commission, and indeed the OCA itself, employed PECO's 1980 load forecast at Docket No. R-80061225, where the Commission rejected a similar excess capacity adjustment advanced by the OCA.

PECO argues that the ultimate issue in this proceeding, i.e. completion or cancellation of PECO's Limerick Nuclear Generating Station, is a far different issue than the excess capacity dispute at Docket No. R-79060865 with its revenue effects upon PECO of but $5 million. The time period involved in the various forecasts offered on this record are far longer than the limited period examined at R.I.D. 865. Basic assumptions about fuel costs, conservation, and commercial and industrial use of energy have changed in the period between the Docket No. R-79060865 proceeding and the proceeding here.

PECO argues that its proposed growth rate presents a reasonable and prudent estimate of what that result will be especially when the potential cost of the unavailability of an adequate future supply of reasonably priced electricity is considered. As explained by Mr. Hoch (PECO Statment No. 3B, pp. 19-20):

> As I have pointed out, the major difference between my forecast and the ESRG Base forecast lie in anticipated 1990's sales levels. While I have stated it before, it bears repeating that neither Dr. Stutz nor myself can claim omnipotence in projecting these usuage levels. Any number of events can occur over the next ten years which could disrupt either his, mine or both of our assumptions. Dr. Stutz does not assume any increase in electricity usage for space heating or fossil fuel substitution in the transportation or industrial areas. I believe that such increased usage will occur as presently used fossil fuels become scarce and prohibitively expensive. I also believe, as does Dr. Stutz, that there will be increased usage of conservation and renewable energy alternatives. However, it must be recognized that many of these alternatives are expensive, their technologies remain to be developed and their market acceptance has not yet been tested. Accordingly, the extent of their future usage is highly uncertain at this time. We must therefore be careful in our anticipations as to the level of their contribution.

As noted above, OCA witness Stutz claims that the ESRG forecast should be used on the basis of the accuracy of its aggregate forecasts in the recent past.

It appears that the ESRG base case forecast, which forecasts a lower growth than the company's, may well be appropriate for use here as the level of future growth. For whatever reasons, it has been accurate in the recent past and provides a conservative assumption upon which to base a decision here. In adopting its use here, I do not adopt its methodology, only its result. Use of a 1.7% growth rate for PJM, based on recent experience appears appropriate also.

Finally, OCA criticizes PECO's assumptions used in its FINAN Model regarding the costs of long and short-term debt, achieved equity return lload and the market price of PECO stock during Limerick construction (OCA M.B., pp. IV-12 to IV-17).

All agreed that the rate of inflation and cost of money would have a direct impact on Limerick (OCA Statment No. 2A, pp. 4-5; Tr. 3427). OCA argues, however, that PECO's assumptions are unreasonably optimistic. PECO argues that the OCA perceives optimism only because its own estimates of PECO equity market performance and debt cost are unrealistically constructed.

PECO witness Dr. Hieronymus testified that, with respect to equity market performance, OCA witness Czahar makes the same optimistic assumption as does PECO, assuming a 9% inflation rate, a 15% earned rate of return (except during 1981 to 1985 when it is higher) and dividends and earnings which grow at a rate equal to the growth rate in rate base. With such assumptions, he testified, it is reasonable to expect a market-to-book issue at least equal to one. Yet, OCA witness Czahar also

assumes a market-to-book ratio of 0.8 (PECO Statement No. 15, pp. 78-79).

With respect to debt costs, OCA witness Czahar took a similar negative tact. Mr. Czahar, as a member of the Staff of the California Public Utility Commission, participated in the preparation of future capital cost assumptions for use in planning and reporting by two California electric utilities (Tr. 3485-86). The financing cost assumptions prepared contained in both an optimistic and pessimistic set of cost estimates, intended to bracket likely future inflation and debt cost possibilities (PECO Exh. 16; Tr. 3486-87). Here however, Mr. Czahar chose to employ the pessimistic set of debt costs and inflation estimates, resulting in debt cost estimates for the Limerick construction period much above those projected by PECO. PECO notes that the more optimistic assumptions, recognized by Mr. Czahar as equally as plausible, are not significantly different from those employed by it. Further, PECO argues reflecting more pessimistic debt costs and equity returns does not alter the conclusion that completion of the Limerick project remains the economic best alternative. The OCA notes that PECO witness Lawrence's later analyses in this proceeding reflect higher cost of money assumptions and that these assumptions render non-fuel cost of Scenario No. 1 (completion of Limerick Units 1 and 2) some $1,130 million higher than was the case at lower debt cost levels (OCA M.B., pp. IV-16). Mr. Lawrence however, performed the same calculation for all of the PECO scenarios and that analysis demonstrated that completion of both Limerick Units remains the least cost alternative (PECO M.B., p. 39a). It must also be recognized that increased debt cost assumptions increase the cost of each construction scenario and impacts scenarios other than completion scenario more adversely because these other construction alternatives

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 associated with these abandoned units.

Finally, even using the ESRG Conservation Scenario, the results 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

pretension to specialized knowledge on the subject under investigation he may testify, and the weight to be given to his evidence is for the jury...." Moodie v. Westinghouse Electric Corp., 367 Pa. 493 (1951). Accord, Kuisis v. Bladwin-Lima-Hamilton Corp., 457 Pa. 321 (1974). The witness, through his education and experience, meets the minimum requirements of that standard.

With respect to the company's allegations of hearsay, it is true that with a limited exception regarding medical witnesses, Pennsylvania case law states that an expert may not state a conclusion which is based on evidence not in the record. Commonwealth v. Thomas, 444 Pa. 436, 445 (1971). Much of the testimony cited relies on newspaper articles and reports not in the record. However, this Commission is not bound by strict adherence to the technical rules of evidence. This testimony will, therefore, be admitted. The weight accorded it is, however, a separate matter.

PECO has also filed a motion to exclude certain parts of CEPA witness Lovins testimony. Its argues that portions of Mr. Lovins' direct and surrebuttal testimony should be excluded on the ground that they represent hearsay. Specifically, the conclusions of Mr. Lovins related to nuclear capital and operating costs should be excluded because they rely solely on analyses prepared by a Mr. Charles Komanoff (CEPA Statement No. 1, CEPA Exh. ABL-3, at 55-58; CEPA Statement No. 1A, pp. 25-26.) Mr. Komanoff is not available to be cross-examined by PECO, while his statistical data are being presented by Mr. Lovins to prove the truth of this information. Thus, PECO argues, the Komanoff analysis is hearsay in the classic sense, and should be excluded.

Similarly, PECO claims that Mr. Lovins relies on a study performed by a Mr. Roger Sant for the Mellon Institute to support his conclusions regarding the fuel savings arising from alternative resources and improvements in fuel efficiencies. (See CEPA Statement No. 1, Exh. ABL-2 p. 51; CEPA Statement No. 1A, pp 10-11.) Here again, it argues, Mr. Sant is not available for cross-examination as to how he conducted his study. Mr. Lovins' conclusions rest entirely on hearsay, and these portions of his testimony should be excluded for this reason.

For the reasons, stated above, regarding a similar motion with respect to Keystone Alliance Statement No. 2, this motion will be denied. 25/

PECO also argues that pages 30-33, Table 2, p. 24 (lines 1-17) and accompanying Table 3 of CEPA Statement 1A should be excluded alleging that this matter falls outside the scope of proper surrebuttal. According to PECO, these portions of the Lovins' surrebuttal neither refute new material raised in the companys rebuttal testimony nor explain prior analysis. Rather, it is claimed, these are two new mathematical analysis representing new methodologies for presenting the same conclusions contained in the direct testimony.

While the company may be technically correct, the company has not alleged any prejudice or harm as a result of allowing this information in the record. While better procedure might have been to present

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25/ So also will PECO's motion to exclude from the record the "financial opinions" of CEPA witnesses Praul and Folin (Tr. 596-600; Tr. 1035-41; PECO M.B., p. 265; PECO R.B., pp. 98-100, fn. 9).

this matter as part of CEPA Statement No. 1, the public interest is better served by permitting it into the record.

Contributions In Aid of Construction

Trial Staff recommends that, to provide for the contingency that some kind of advance funding will be necessary to prevent a further postponement of construction of Limerick, PECO be directed to draft a standby plan for obtaining contributions in aid of construction (CIAC), i.e. ratepayer-supplied dollars used directly by PECO in constructing Limerick, and to request a letter ruling from the Internal Revenue Service as to the exempt status of such revenues (T.S.M.B., pp. 20-26).

Trial Staff argues that such contributions would not be taxable to the utility, unlike return on CWIP or plant in service, so that a utility's cash flow from CIAC revenue will be double the cash flow from equivalent revenue due to CWIP in rate base.

Trial Staff recognizes that CIAC has its detriments also. The main one is that the CIAC revenue cannot be leveraged into borrowing more debt because these revenues would not be counted in computing interest coverage.

PECO, however, sees other problems with this concept. First, and foremost, PECO argues that Limerick construction expenditures do not qualify for CIAC treatment under the Internal Revenue Code §118. Section 118, according to PECO, contemplates a situation in which there is a voluntary decision to make a contribution to the utility, not a circumstance where ratepayers are directed by the Commission to finance a project (PECO Statement No. 17, pp. 9-11). In addition, it would greatly increase rates in the near-term due to the increased revenue requirement that would be necessary in the next few years and the fact,

as previously mentioned, that CIAC provides no leverage. As an example, PECO witness Lawrence explained (PECO Statement No. 11B, p. 3):

> [A] customer contribution of $100 million provides only $100 million of additional capital for the Company's construction program. On the other hand $100 million of revenue associated with CWIP produces additional earnings for mortgage coverage. Assuming a 15% interest rate, these earnings could support some $333 million in additional debt thereby "leveraging" the ratepayers' dollars for maximum positive impact on the construction program.
>
> Additionally, PECO's commercial and industrial customers would be penalized each year because these customers will lose the benefit of tax deductibility which they have for normal utility rate expenses.

PAIEUG argues that CIAC financing would require PECO's customers to make forced investments in PECO plant in addition to the regular payments for electric service. PAIEUG calculates that such charges would increase the cost of electricity to industrial customers by 14% (PAIEUG Statement No. 1, p. 8, Table 3).

Trial Staff has proposed an innovative idea but one which, under the circumstances here will not assist in the construction of Limerick. Even if Trial Staff is correct and these contributions would qualify under Section 118, an assumption which is indeed questionable.[26/]

26/ See Construction Work In Progress for Public Utilities, FERC Docket No. RM 81-38, Notice of Proposed Rulemaking (issued July 27, 1981), where the Commission stated:

> If this customer contribution is not considered taxable income to utilities by the Internal Revenue Service, required contributions in aid of construction could be the least costly way for consumers to provide aid to ailing utilities. However, the Commission believes it is unlikely that the IRS would find such contributions to be non-taxable income.

In addition, this proposal would undoubtedly provoke extensive litigation, which would effectively prohibit its usefulness to this company in financing the completion of Limerick. Trial Staff's request should be denied.

CONCLUSION

After reviewing the extensive record in this proceeding, I can come to but one conclusion -- that at the present time there is no alternative available that can replace Limerick at a lower cost to the consumer. The record shows that the timely completion of Limerick Units I and II is in the best interests of PECO and its ratepayers. Since the generation produced at Limerick will replace expensive oil-fired generation either produced by the company itself or purchased from the PJM system, these plants must be brought on line as soon as possible. It is essential, therefore, that this project be completed as close to the 1985/1987 projected commercial operation dates as possible and as close to the company's projected costs as possible. While it must be recognized that licensing delays outside the control of the company or this Commission could affect these dates, this Commission must assure itself, and the ratepayers it represents, that completion of this facility will be undertaken as expeditiously as possible and at the lowest possible cost.

For this reason, the Commission should accept Trial Staff's proposal that PECO notify the Commission immediately of any occurrence which will affect the critical path of construction and, therefore, the completion dates, and of any deviations from PECO's cost projections in excess of one million dollars. PECO should further be required to

explain and justify any deviations in completion date or cost within two weeks of the notification to the Commission, and, in particular, should be required to demonstrate why the delay or overun was not within the control of PECO or its architect-constructor in the exercise of sound management.

As further monitoring of construction activity and costs, the Commission should order PECO to submit within 120 days a detailed schedule of specific construction and cost milestones to be reached in each subsequent two month period over the next two years, and require reports every two months specifying what milestones have been met. As a further means to implement this procedure, the Commission should consider establishment of an internal ad hoc Limerick Task Force to review these reports and take such action as may be necessary to assure the prompt completion of the facility.

In addition PECO should also be placed on notice that the Commission will make future rate base allowances on only those capital expenditures that have been prudently incurred.

In view of the magnitude of the costs involved and the benefits of bringing Limerick on line as expeditiously as possible, this Commission should explore the benefits of an incentive rate of return (IROR) plan for the remaining construction work at Limerick similar to the one now under consideration by the New York Public Service Commission with respect to the Nine Mile Point No. 2 project. See Case 28059 - Proceeding to inquire into the financial and economic cost implication of constructing the Nine Mile Point Unit No. 2 Nuclear Station, Notice Requesting Public Comments (issued February 23, 1982).

Under such a proposal there would be economic rewards for holding down costs and economic penalties for cost overruns. In PECO's case if it completed Limerick for less than its projected cost, its shareholders would benefit by enjoying higher returns on their investment and PECO ratepayers would enjoy the cost savings resulting from the displacement of oil-fired generation. If substantial cost overruns were experienced, an incentive rate of return would place part of these additional costs on shareholders and thereby reduce the ratepayer's burden.

It is not necessary to adopt at this time a specific incentive rate of return plan.27/ Rather the principle should be discussed and, if adopted, the mechanics worked out later. What is important is that after this proceeding concludes, and the Commission's attention turns to other matters, there is a continuing incentive for the company to complete this project as economically and expeditiously as possible.

As noted earlier in this decision, no one can take any satisfaction from the history of this project as detailed by this record. In many respects it mirrors the history of the electric utility industry as a whole-rising costs, flattened demand, and increased public concern, not only over the cost of generation, but also the manner of generation. But this proceeding is essentially one involving numbers -- albeit projected ones -- and those numbers, however dismal due to their magnitude, are on the side of completing both Limerick units.

27/ New York's proposed plan is appended to this decision as Appendix E.

THEREFORE, IT IS ORDERED:

1. That the Philadelphia Electric Company is directed to notify this Commission immediately of any occurrence, after the date of this Order, which will affect the completion of the Limerick Nuclear Generating Station according to the schedule set forth in Bechtel Forecast 5 (PECO Exhibit 2) and any deviations from the cost projections set forth in PECO Exhibit 2 in excess of $1,000,000.

2. Within two weeks of such notification, the company is directed to explain such deviations and show why the delay or deviation was not within the control of it or its architect-constructor.

3. Within 120 days of the date of entry of this Order, the company is directed to submit a detailed schedule of specific construction and cost milestones to be reached in each subsequent two month period. The company is directed to report to the Commission at two month intervals detailing what milestones have been met.

4. That this investigation be terminated and the record marked closed.

Joseph J. Klovekorn
Administrative Law Judge

March 26, 1982
DATE

Table 1

PECO Decremental Cost Estimate
ESRG 5/5/81 Revised Testimony and PECO Arithmetic Corrections

	Average Revenue Requirement (10^9 1979$)	Rev. Req.(e)	Sales(b) (10^9 KWh)	Decremental(f) Cost (mills/KWh)
1. ESRG 5/5/81(a)				
PECO Forecast	24.18	2.76	105	26.3
ESRG Base	21.42			
ESRG Conservation	19.07	2.35	90.6	25.9
2. PECO Arithmetic Corrections(c)				
PECO Forecast	24.06	2.87	105	27.3
ESRG Base	21.19			
ESRG Conservation	18.98	2.21	90.6	24.4

3. Correction for 1981$ = 1979 x 1.293(d)

Low estimate = 24.4 x 1.293
= 31.5 mills/KWh

High estimate = 27.3 x 1.293
= 35.3 mills/KWh

Notes to Table 1:

(a) PECO Exhibit 6, Table 2, line 1a.

(b) Testimony of R. Rosen, Appendix A, Tables A-3, A-4, A-5 adjusted for transmission losses of 9%.

(c) PECO Exhibit 6, Table 2, line 3a.

(d) Testimony of R. Rosen, 2/27/81, p. 11.

(e) Rev. Req. = Average Rev. Req. Forecast$_i$ -

Average Rev. Req. Forecast$_j$

(f) Decremental Cost = Rev. Req./ Sales

Table 2

PECO Decremental Cost Estimate
Hieronymous Calculations

	Average Revenue Requirement (10^9 1981$)	Rev. Req.	Sales(c) (10^9 KWh)	Decremental Cost (Mills/KWh)
PECO Forecast(a)	33.20			
		4.13	105	39.3
ESRG Base(b)	29.07			
		3.88	90.6	42.8
ESRG Conservation(a)	25.19			

Notes to Table 2

(a) Testimony of W. Hieronymous, Schedule L
(b) Testimony of W. Hieronymous, Schedule K
(c) Same as Table 1

Table 3

PECO Decremental Cost Estimate

Lawrence Calculations - Limerick Termination

1. Production Cost Savings (10^6\$)

A. Coal Replacement

	PECO Forecast(a)	Zero Growth(b)	
1980-84	976	979	
1985-89	1573	1250	(3)
1990-94	1899	1092	223
			807

B. No Replacement(c)

		(d)	
1980-84	976	979	
1985-89	1622	1293	(3)
1990-94	2993	1994	329
			999

2. Fixed Cost Savings (106\$)

A. Coal Replacement

	Limerick(e)	No Limerick(f)	
1980-84	1140	1261	
1985-89	2248	1876	(121)
1990-94	2930	2961	372
			(31)

B. No Replacement(e)

		(g)	
1980-84	1140	1261	
1985-89	2248	1844	(121)
1990-94	2930	2267	404
			663

3. Decremental Cost (=1/2 [1A+1B] + [1/2 2A+2B])

1980-84	4 x (124)	= (496)
1985-89	5 x (267 + 388)	= 3320
1990-94	5 x (903 + 315)	= 6093

PV at 13.7%:

.733 (496) = = (364)
.414 x 3320 = 1375
.218 x 6093 = 1328

Total PV =\$2230 x 106
Sales = 68.3 x 10^9 KWh

Decremental Cost = 34.3 mills/KWh

Notes to Table 3

a) Rebuttal testimony of K. Lawrence, PECO Statement No. 11-A, Schedule A-2, Alternative No. 3
b) Rebuttal testimony of K. Lawrence, Sch. B, Alternative No. 3
c) Lawrence, Sch. A-2, Alt. No. 4
d) Lawrence, Sch. B., Alt. No. 4
e) Lawrence, Sch. A-2, Alt. No. 1
f) Lawrence, Sch. A-2, Alt. No. 3
g) Lawrence, Sch. A-2, Alt. No. 4

ERRATA - Testimony of
Edward P. Kahn

Page 2 mid page - Office of Consumer

9 end of 1st paragraph - than should be then

11 1st full paragraphs - rante should be rate
last paragraph - costs should not be repeated

12 last line - Table 4

16 last line of 1st paragraph - air conditioners

17 4th line from bottom - There should be They

19 1st question - expenses should be expensed
equation should be equation (2)

20 1st equation should be equation (3)
2nd equation should read:
CCGC = PV (Annual Unit Cost)/n

31 below mid page, line should read "solid waste generation projects <u>that</u> would displace <u>some part of</u> the need for Limerick."

Schedule Q

IMPACT OF CONSERVATION EXPENDITURES ON
AVERAGE ELECTIC RATES
(Cents per Kilowatthour)

Year	ESRG Base Scenario Rate Case 01 (¢/kwh)	ESRG Conservation Scenario Case C2 (¢/kwh)
1981	6.54	6.56
1983	8.37	8.71
1985	10.13	11.38
1987	12.08	14.82
1989	14.85	19.30
1991	16.22	20.60
1993	17.78	21.62
1995	22.77	26.01
1997	28.94	31.96
1999	32.79	36.16

APPENDIX C

PECo Conservation Program Goals
1990 Levels

1. Commercial Sector

A. Existing Buildings

1. 1980 TOTAL Market = 9715 gWh
(consisting of Small C&I = 3065 and
Other Non-manufacturing in Large C&I = 6650, see
Ex. WCH-1, p. 206,210).

2. PECo Conservation Estimate = 550 gWh
(see PECo Statement 3A, p. 29)

3. NET Market ((1)-(2)) = 9125 gWh

4. 20% Program Goal = 1833 gWh
(equal to about 25%
reduction without (2))

B. New Buildings

1. PECo Forecast 1990
Large C&I - Other Non-manufacturing = 8240
1980 Base = 6650

Growth = 1770

Small C&I - 1990 = 3586
1980 Base = 3065
Growth = 521

Total Growth = 2291

2. Adjustment to 1980 Base for = 550
PECo Conservation

3. NET New Market = 2841

4. 15% Program Goal = 426 gWh

C. Total Commercial = 2259 gWh

2. Residential Sector

A. Refrigeration Efficiency

1. 1990 Total Use = 2196 gWh

2. 50% Savings Goal = 1098 gWh

B. Electric Water Heating: Retrofit and New Market

1. 1990 Total Use = 1065 gWh

2. PECo estimate of solar hot water and hear pump = 18,000 out of 272,000 total or 6.6% (see Ex. WCH-1, p. 116 and p. 150).

3. Total Retrofit/New Market Penetration Goals: 90% of existing market, all of new-market post-1982.

1982 existing market = .74 1990 Total customers.

4. Fraction of (1) eligible for program
(.74 (.9) + .26) .934 = .875

5. 50% energy displacement, yields
Total savings = (.865) (.50) 1065 = 461 gWh

C. Electric Space Heating: BEPS Standards for New Construction - 1982 Implementation

1. PECo 1990 forecast of total RH customers = 175,000
RH sales = 1385 gWh

2. 1982 forecast of total RH customers = 76,000
RH sales = 654 gWh

3. Market for new standards = 99,000 customers
(=(1)-(2)) = 731 gWh

4. Standards Impact on Heating Load at 30% = 219 gWh

5. Standards Impact on Central
Air Conditioning at 17% + 15 gWh
90,000 units at 1000 kWh/unit

6. Total impact = 234 gWh

D. Weatherization Retrofit

1. Heating auxiliaries: total 1990 market = 470 gWh

Savings (weighted average at 30%) = 141 gWh

2. Supplementary Heating: 1990 market = 103 gWh

Savings (weighted average at 30%) = 31 gWh

3. Room coolers: 1990 market = 247 gWh

Savings (weighted average at 17%) = 42 gWh

4. Existing RH customers
1982 = 76,000 customers

Savings at 2500 KWh/customer = 190 gWh
(see Feldman-Wirtshafter,
Direct-testimony, p. 13)

5. Total Impact = 404 gWh

E. Total Residential = 2197

APPENDIX D

TABLE 9 - Schedule A

COST TO RATEPAYERS OF LIMERICK CANCELLATION
AT DIFFERENT LEVELS OF CORRECTION TO OR AMENDMENT OF
THE OCA WITNESSES CASES
(Millions of 1979 Present Value Dollars)

Cancellation Scenario	Unit 2 Cancellation			Units 1 and 2 Cancellation		
	G_3	T_2	I_1	F_2	U_1	N_1
Load Growth Scenario (%)	2.9	1.5	-0.5	2.9	1.5	-0.5
ESRG Estimate per Czahar Schedule D	239	211	(151)	17	(425)	(488)
Correction of Production Costing, Capital Recovery and Allocation Errors; April 82 Cancellation Date	473	355	(39)	992	426	(27)
PJM Expansion Plan Consistent with Load Growth	473	409	315	992	607	236
Construction Cost, Nuclear O&M and Nuclear Capacity Factor Midway Between OCA and PECO Estimates	907	596	488	1762	1289	820
Recognition of Return on sunk cost	1169	861	762	2952	2473	2022
Recognition of Life Cycle Savings	1350	1199	1538	3822	3231	2892

APPENDIX E

Extract from Case 28 059 - Proceedin to inquire into the financial and economic cost implication of constructing the Nine Mile Point Unit No. 2 Nuclear Station, Notice Requesting Public Comments (issued February 23, 1982) (New York Public Service Commission)

Details of Incentive Rate of Return Plan

We propose to adopt an incentive rate of return plan employing the following parameters. We invite interested parties to comment upon the specific elements of this proposal.

1. The costs that will be subject to the incentive mechanism will be the prospective Nine Mile 2 costs, i.e., the costs incurred from a date certain, including AFUDC, to complete and bring into service the Nine Mile Point No. 2 facility.

2. The target completion cost will be $4.6 billion and will provide for no exclusions. This is the midpoint of the range projected by the staff for completion of the facility in 1986 ($4.3 billion) and 1987 ($4.9 billion). We think that staff's projections are the most objective and reasonable of those presented in the record of this case and, for that reason, believe they should be employed for the purpose of providing realistic incentives and penalties. We recognize that selection of this target figure is an important element of this proposal and the parties should, of course, feel free to comment upon this tentative decision. We further find meritorious the points raised by staff during the conference concerning the undesirability of exclusions in a program that has as a cornerstone a requirement that the utility share in all of the risks of the venture.

3. A constant sharing factor of 20% will be applied to the change in revenue requirement from the target level occasioned by the cost overrun or underrun. Viewed from a risk-sharing perspective, this would mean that 20% of increased revenue requirements, caused by construction

cost overruns, would be contributed by stockholders. Conversely, 20% of any savings in revenue requirements because of reduced construction costs would flow to stockholders. Appendix A sets forth several illustrative scenarios as to how this plan would operate and the return consequences associated with each. It will be observed that under a different range of different case assumptions, the co-tenants could achieve an incentive return on the incremental investment approaching 27%* for bring the facility in $1.5 billion under target and stand to lose $65.7 million for an overrun of the same magnitude.

A variation on this theme we also have under consideration would be to increase the potential incentive for underruns to 40% of the cost savings, while holding the penalty at 20%. This variation may be necessary to properly reflect the fact that a large cost overrun is more likely to occur than a large cost underrun. Thus, in order to provide a system of incentives that is fair in relation to the probability of actually achieving a particular result, it may be necessary to skew the percentage of risk in the direction of a greater incentive for cost underruns. Again, parties are encouraged to give us their views on this alternative.

Yet another variation on this general theme we have under consideration would be to impose a variable cost sharing equal to .6 times the percentage overrun or savings in revenue requirement relative to the target. Thus, a 5% cost underrun would result in

---

* Assuming a required return of 17.0%. If the target return on equity changes, the incentive/penalty rate of return would change proportionately.

the stockholders retaining 3% of the savings, but a 30% underrun would enable the co-tenants to earn 18% of the savings for stockholders. Conversely, of course, smaller overruns would occasion smaller percentage penalties to stockholders and larger overruns would result in larger proportion of the overruns being assessed to stockholders. This risk-sharing plan is equivalent to the previous flat 20% sharing scheme at over or underruns of 33%. Above or below that level, the fraction shared rises rapidly as shown in Appendix A. Thus, this plan results in a varying proportion of savings/overruns, which increases as the divergence from the target increase, to be shared with stockholders.

4. The cash benefits or penalties associated with implementation of this plan will be assessed over the service life of the Nine Mile Point No. 2 plant on a prorata, depreciated basis.

5. The target "normal" rate of return will be set in the rate case immediately preceding plant completion, and in each case thereafter.

6. The incentive rate of return on prospective equity investments in the plant would not be allowed to fall below one-half of the normal target rate of return.

Appendix A

Coverage Assumptions:

at date of completion

(1) % debt = .45 r_D = .16

% preferred = .13 r_p = .15

% common = .42 r_e = .17

(2) effective tax rate = .45

(3) Total plant for Co-tenants in 1987 without MM2 is $12.6 billion.

Plan Assumptions:

Target Completion Cost	$4,600 million
Target return on equity	17%
Minimum return on equity (1/2 target)	8.5%

20% Sharing of Variations in Revenue Requirement

(All dollar amounts in millions)

Total Cost of Project	Prospective Cost	Over/Under Target	change as a % of prospective target costs	Total change from target Revenue Requirement	Stockholder's amount at 20%	% rate of return on prospective equity in NMT	Coverage
3,100	1,700	-1,500	-46.9	-328.4	65.7	21.9	3.5
3,600	2,200	-1,000	-31.3	-218.9	43.8	19.2	3.4
4,100	2,700	- 500	-15.6	-109.5	21.9	18.0	3.3
4,600	3,200	0	0	0	0	17.0	3.3
5,100	3,700	500	15.6	109.5	-21.9	16.3	3.2
5,600	4,200	1,000	31.3	218.9	-43.8	15.7	3.2
6,100	4,700	1,500	46.9	328.4	-65.7	15.2	3.1
6,600	5,200	2,000	62.5	437.9	-87.6	14.8	3.1

Accelerated Sharing of Variations in Revenue Requirement

(All Dollar Amounts in Millions)

Total Cost of Project	Over/Under Target	Change as a % of prospective target costs	Total change from target revenue requirement	Stockholder's Share	Stockholder's amount	% rate of return on prospective equity in NMT	coverage
3,100	-1,500	-46.9	-328.4	.281	92.29	24.0	3.6
3,600	-1,000	-31.3	-218.9	.188	41.15	19.4	3.4
4,100	- 500	-15.6	-109.5	.094	10.29	17.5	3.3
4,600	0	0	0	0	0	17.0	3.3
5,100	500	15.6	109.5	.094	-10.29	16.6	3.2
5,600	1,000	31.3	218.9	.188	-41.15	15.8	3.2
6,100	1,500	46.9	328.4	.281	-92.29	14.5	3.1
6,600	2,000	62.5	437.9	.375	-164.41	12.9	3.0
7,100	2,500	78.1	547.4	.345	256.7	11.2*	2.9
7,600	3,000	93.7	656.9	.313	369.8	9.4*	2.9
8,100	3,500	109.4	766.4	.580	444.2	8.5*	2.9

*Minimum rate of return on equity investment in prospective expenditures.

40/20% Asymmetric Sharing of Variations in Revenue Requirement

(All Dollar Amounts in Millions)

Total Cost of Project	Prospective Cost	Over/Under Target	Change as a % of prospective Target Costs	Total change from target Revenue Requirement	Stockholder's Amount	% rate of return on prospective equity in NMT	coverage
3,100	2,700	-1,500	-46.9	-328.4	131.4	26.9	3.7
3,600	2,200	-1,000	-31.3	-218.9	87.6	22.1	3.5
4,100	2,700	- 500	-15.6	-109.5	43.8	19.1	3.4
4,600	3,200	0	0	0	0	17.0	3.3
5,100	3,700	500	15.6	109.5	-21.9	16.3	3.2
5,600	4,200	1,000	31.3	218.9	-43.8	15.7	3.2
6,100	4,700	1,500	46.9	328.4	-65.7	15.2	3.1
6,600	5,200	2,000	67.5	437.9	-87.6	14.9	3.1

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March 26, 1986

RECEIVED
MAR 27 1986
SECRETARY'S OFFICE
Public Utility Commission

Jerry Rich, Secretary
Pennsylvania Public Utility Commission
North Office Building
Commonwealth & North Streets
Harrisburg, PA 17120

Re: Pennsylvania Public Utility Commission
v. Philadelphia Electric Company
Docket No. R-850152

Dear Secretary Rich:

Enclosed for filing with the Commission are the original and two copies of Transcript Corrections of Philadelphia Electric Company in the above-captioned proceeding for hearings on March 6, 10, 11, 12, 13 and 17, 1986.

As shown on the attached Certificate of Service, I have today served copies of this document on all Active Parties.

Sincerely,

Jack E. Jerrett

Jack E. Jerrett

ddq
Enclosure

cc: All Active Parties

DOCUMENT FOLDER

RECEIVED
MAR 27 1986
SECRETARY'S OFFICE
Public Utility Commission

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

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

TRANSCRIPT CORRECTIONS OF PHILADELPHIA ELECTRIC COMPANY FOR HEARINGS ON MARCH 6, 10, 11, 12, 13 and 17, 1986

DOCKETED
MAR 27 1986

DOCUMENT FOLDER

March 26, 1986

PECO Transcript Corrections for the hearings held on March 6, 1986

Page	Line	Correction
4049	25	Change "stated in my testimony that." to "stated that in my testimony."
4067	13	Change "erased" to "in rates"

PECO Transcript Corrections for the hearings held on March 10, 1986

Page	Line	Correction
4157	14	Change "re" to "we"
4240	7	Change "8706" to "8760"

PECO Transcript Corrections for the hearings held on March 11, 1986

Page	Line	Correction
4349	9	Change "a" to "am"

PECO Transcript Corrections for the hearings held on March 12, 1986

Page	Line	Correction
4388	13	Change "of the fact" to "in fact"
4477	19	Change "vents" to "events"
4483	13	Change "1982" to "1972"
4483	23	Change "precedence" to "precedents"
4554	15	Change "GCR" to "ECR"
4650	4	Change "factor" to "vector"
4650	7	Change "factor" to "vector"

PECO Transcript Corrections for the hearings held on March 13, 1986

Page	Line	Correction
4774	15	Change "track" to "truck"
4789	19	Change "bargers" to "spargers"
4805	2	Change "measured" to "measurement"

PECO Transcript Corrections for the hearings held on March 17, 1986

Page	Line	Correction
5096	9	Change "284" to "281"
5113	4	Change "direction" to "erection"
5140	4	Change "new regs" to "NUREGS"
5141	6	Change "ccoss" to "cross"
5145	22	Change "content" to "contend"
5147	2	Change "most" to "more"
5150	8	Change "would not" to "would"
5154	23	Change "you" to "your"
5155	14	Change "address" to "addressed"
	20	Change "nuclear projects, and" to "nuclear construction on projects I have reviewed,"
5156	2	Change "five" to "nine"
	3	Change "I have seen" to "Where I have seen it"
	6	Change "important" to "important in order to"
	10	Change "is that there are lists" to "is to have lists"
	15	Change "engineer" to "engineer's"
5157	6	Change "to the" to "in the"
	11	Change "Third, second" to "to "Fourth, a second"
5158	8	Change "each" to "reach"
	16	Change "whole crew" to "whole electrical crew"

Page	Line	Correction
	18	Change "mechanical craft" to "mechanical crew"
5159	5	Change "first crew" to "first shift crew"
	12	Change "type" to "size"
5160	14	Change "to exert" to "to apply"
	15	Change "think" to "think a"
	16	Change "productivity that" to "productivity level that"
5185	19	Change "it" to "is"
5186	1	Change "want" to "went"
5188	16	Change "cost" to "costs"
	19	Change "imprudent of" to "imprudent in"
5195	4	Change "four tens" to "4-10's"
	12	Change "four tens" to "4-10's"
	23	Change "four tens" to "4-10's"

CERTIFICATE OF SERVICE

I hereby certify that on March 26, 1986 I served copies of the Transcript Corrections of Philadelphia Electric Company for Hearings on March 6, 10, 11, 12, 13 and 17, 1986 at Docket No. R-850152, upon the following by regular mail.

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ORIGINAL

BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

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MAR 21 1986

SECRETARY'S OFFICE
Public Utility Commission

Pennsylvania Public Utility Commission, et al	:	R-850152
v.	:	
Philadelphia Electric Company	:	

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ORDER

At the oral request of counsel for Philadelphia Electric Company, the time for filing its delayed exhibit relating to the documents from the record of Limerick Nuclear Generating Station Investigation, Docket No. I-80100341 to be incorporated into the record of the instant proceeding by order entered December 20, 1985, is hereby extended to Friday, March 21, 1986.

March 20, 1986

Joseph P. Matuscak
Administrative Law Judge

STD-501 1-84

COMMONWEALTH OF PENNSYLVANIA
March 20, 1986

SUBJECT: Pa. Public Utility Commission v. Philadelphia Electric Company
R-850152

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Public Utility Commission

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Office of A. L. J.
Public Utility Commission

TO: William H. Smith, Chief
Administrative Law Judge

FROM: Joseph P. Matuschak
Administrative Law Judge

Enclosed please find an original and a copy of an Order in the above-captioned case. Copies have been sent to the following parties of record:

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If you have any questions, please call this office.

Enclosures

#296
3/31/86

As a senior citizen living on a limited income, I object to the proposed 30% hike in electric rates.

We did not request, nor need, Limerick 1, and PECO should pay for it's own mistakes.

Mrs Dorothy Smith
(Signature)

64 Versailles Way
(Address)

Levittown Pa 19054

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MAR 26 1986

Senate of Pennsylvania

H. CRAIG LEWIS

Chairman Pollafeno

R-850157

FOR YOUR INFORMATION ☑

AS PER YOUR REQUEST ☐

OTHER:

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As a senior citizen living on a limited income, I object to the proposed 30% hike in electric rates.

We did not request, nor need, Limerick 1, and PECO should pay for it's own mistakes.

Mildred E. Lewis
(Signature)

15 Inwood Rd
(Address)

Levittown, Pa. 19057

As a senior citizen living on a limited income,
I object to the proposed 30% hike in electric rates.

We did not request, nor need, Limerick 1, and
PECO should pay for it's own mistakes.

Shirley Stellwagen
(Signature)
2180 New Rodgers Rd, Apt. 905
Levittown Pa 19056
(Address)

As a senior citizen living on a limited income,
I object to the proposed 30% hike in electric rates.

We did not request, nor need, Limerick 1, and
PECO should pay for it's own mistakes.

Andrew A. Jarosch
(Signature)
Levittown Pa 19054
(Address)

As a senior citizen living on a limited income,
I object to the proposed 30% hike in electric rates.

We did not request, nor need, Limerick 1, and
PECO should pay for it's own mistakes.

Mrs. Susan Conn.
(Signature)
722 Auburn Rd.
Fairless Hills Pa,
(Address) 19030

PENNSYLVANIA PUBLIC UTILITY COMMISSION
COMMONWEALTH OF PENNSYLVANIA
HARRISBURG, PENNSYLVANIA

LINDA C. TALIAFERRO
CHAIRMAN

TELEPHONE
(717) 787-4301

March 26, 1986

Re: Docket R-850152

Honorable Clarence D. Bell
Senate of Pennsylvania
The State Capitol
Harrisburg, Pennsylvania 17120-0030

Dear Senator Bell:

Thank you for your letter of March 18, 1986, and the enclosed petitions containing 1,343 signatures protesting the proposed rate increase of Philadelphia Electric Company at the above docket number.

I shall have these petitions placed with the permanent record in this proceeding.

Thank you again. If I can be of further assistance, please contact my office.

Sincerely,

Linda C. Taliaferro (el)

Linda C. Taliaferro
Chairman

DOCUMENT
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ORIGINAL

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PENNSYLVANIA PUBLIC UTILITY COMMISSION	:	
v.	:	DOCKET NO. R-850152
PHILADELPHIA ELECTRIC COMPANY	:	

DOCUMENT FOLDER

RECEIVED
APR 4 1986
SECRETARY'S OFFICE
Public Utility Commission

MAIN BRIEF ON BEHALF OF

ACTION ALLIANCE OF SENIOR CITIZENS,
ASSOCIATION OF COMMUNITY ORGANIZATIONS FOR REFORM NOW
CONSUMERS EDUCATION AND PROTECTIVE ASSOCIATION
PHILADELPHIA CITIZENS IN ACTION, AND
MR. BRADSHAW

DOCKETED
APR 07 1986

JOHN HANGER
COUNSEL FOR CEPA, AASC
PCIA, ACORN, and
MR. BRADSHAW

COMMUNITY LEGAL SERVICES, INC.
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3638 N. Broad Street
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I. INTRODUCTION

This Main Brief is filed on behalf of the Action Alliance of Senior Citizens (AASC), Association of Community Organizations for Reform Now (ACORN), Consumer Education and Protective Association (CEPA), Philadelphia Citizens In Action (PCIA), and Mr. Bradshaw. The four intervenor organizations with memberships of low-income and elderly persons and Mr. Bradshaw who lives on a pension participate in this case for one reason. They want to alert the Pennsylvania Public Utility Commission to the fact that 226,000 low-income households residing in the Philadelphia Electric Company cannot pay the rates proposed by PECO in this filing. Consequently, rate structure reforms must be adopted by the Commission for electricity to be accessible to the 20% of PECO ratepayers who are low-income. Specifically, CEPA, AASC, ACORN, PCIA and Mr. Bradshaw urge that the Commission adopt an essential need rate for residential electric customers, allocate production plant costs on the basis of an average and excess method, and allocate distribution plant on a consistent demand basis.

Unless the above reforms are adopted, the 226,000 low-income households (33% of these households are elderly) in PECO's service territory will be priced out of the electric "market" by the Commission. A quick look at residential termination data for PECO confirms this fact. PECO shut-off 41,853 residences in 1985, and PECO now performs approximately two-thirds of all electric residential terminations conducted in Pennsylvania. Indeed, in 1985, PECO shut-off 24% more residences than it did in

1984. If the number of PECO terminations continue to increase annually by 24% for the next four years, PECO will shut-off 98,947 residences by 1989. In fact, with the enormous rate increase requested by PECO in this case, it is very likely that the number of terminations conducted by PECO will increase by more than 24% on an annual basis over the next four years and, therefore, residential terminations will total more than 98,947.

This Commission confronts an ability-to-pay crisis in this case that is much worse than it was 12 months or 24 months ago and is particularly acute in the PECO service territory. So many people face loss of electric service that the Commission's decision will impact public health and safety. Indeed, the magnitude of the access crisis makes it imperative that the Commission address this issue in the manner suggested by the Office of Consumer Advocate and CEPA, AASC, ACORN, PCIA and Mr. Bradshaw. The Commission cannot use the state legislature as a means to pass the buck. All energy assistance and conservation programs combined only help 7% of low-income PECO ratepayers to pay or reduce their electric bill. 93% of low-income households received no assistance of any kind. Both this Commission and the state legislature must act. The action of this Commission must include rate structure reform which attacks the access problem at its source: the size of the household bill. No other initiative can benefit as efficiently such a large portion of low-income PECO families.

Without the rate structure reforms proposed by OCA witness Oliver and CEPA witness Sterzinger, PECO's rates will

deny access or endanger access to vital electric service to the 20% of all PECO ratepayers (30% of all PECO ratepayers living in Philadelphia) who are low-income. Rates that have this effect are not just and reasonable. Additionally, such rates would violate low-income households' right to equal protection of law as guaranteed by the Pennsylvania Constitution.

II. SUMMARY OF EVIDENCE

This portion of CEPA et al's Brief will summarize and evaluate the evidence presented in this proceeding. CEPA's summary and evaluation will also include an analysis, when relevant, of all parties' cross-examination of the pre-filed testimony and exhibits.

A. DIRECT TESTIMONY

1. CEPA WITNESS GEORGE GRIER PROVED THAT 20% OF ALL PECO HOUSEHOLDS HAVE INCOMES BELOW 150% OF THE POVERTY LEVEL.

Mr. Grier concludes that 226,000 households with incomes below 150% of the federal poverty line lived in PECO's service territory. (See, CEPA, et al, Stmt. No. 1, p. 12). In those households, 600,000 persons reside. Converting these numbers to percentages, Mr. Grier finds that 20% of PECO's residential customers are low-income, and 30% of PECO customers in Philadelphia have household incomes below 150% of the poverty level. (See CEPA, et al, Stmt. No. 1, p. 12).

Mr. Grier utilizes 150% of the poverty level as his definition of low-income, because Pennsylvania's Low-Income Home Energy Assistance Program (LIHEAP) uses 150% of the poverty level as the maximum income a household can have and qualify for a LIHEAP grant. (See CEPA et al, Stmt., No. 1, p. 6; Exhibit GG-2). Households with incomes at or below 150% of the poverty level, therefore, "are recognized under the laws of both the

United States and the Commonwealth of Pennsylvania as having incomes so low that they require special financial aid form the government if they are to meet their energy bills." (See CEPA, et al. Stmt. No. 1, p.8).

Mr. Grier's testimony also establishes that low-income households typically have few persons living in them. The most numerous low-income household size is one person (38% of the total). (See CEPA, et al., Stmt. No. 1, p 12-13; Exhibit GG -5). Indeed, 60% of all low-income households are composed either of one or two persons. (See, CEPA, et al, Stmt. No. 1, Exhibit GG-5). Mr. Grier, moreover, determines that only 8% of low-income households have six or more persons. (See CEPA, et al., Stmt. No. 1, p. 13; Exhibit GG-5).

Mr. Grier also states that 57% of the persons living by themselves in one person households are elderly. (See CEPA, et al., Stmt. Nol 1, p. 13-14). Indeed, Mr. Grier states that 49,000 senior citizens in PECO's service territory are low-income and living alone. (See, CEPA, et al., Stmt. No. 1, p. 13-14). Of course, these senior citizens are made vulnerable by poverty, age, and often, isolation and are very threatened by PECO's requested rate increase.

2. MR. GRIER DEMONSTRATED THAT LOW-INCOME HOUSEHOLDS CANNOT PAY PECO'S REQUESTED RATES

Mr. Grier concluded that the average, annual income of low-income households living in PECO's service territory is $7,826.00. (See, CEPA, et al., Stmt. No. 1; Exhibit GG-4). On a

monthly basis, the average low-income household receives $652.00. Mr. Grier unsurprisingly, given these income levels, indicates that the budgets of low-income households are already stretched to or beyond the breaking point. For example, Mr. Grier shows that single-person-low-income ratepayer households who rent have a monthly deficit of $26.00 after only shelter and food expenses. (See, CEPA, et al., Stmt. No 1, p.20; Exhibit GG-9). Single-person-low-income households who own their home have $2.00 left after just shelter and food expenses. (See, CEPA, et al., Stmt., No. 1, p. 21; Exhibit GG-9). Two things about these facts should be remembered. First, 57% of single-person-low-income households are elderly, and single-person-low-income households equal 38% of all low-income households. (See, CEPA, et al., Stmt., No. 1, p. 13-14; Exhibit GG-5). Second, the data reflect the present state of household budgets before PECO's rates increase one cent.

Another way to gauge the ability-to-pay problems of low-income households is to determine the proportion of their incomes consumed by PECO's bills. Again, Mr. Grier conclusions are grim.

Mr. Grier finds that the average low-income household will spend more than 8% of its total income on electricity if PECO' rate request is granted. The average low-income single-person household (57% of which consist of senior citizens) will spend over 14% of its total income paying PECO bills. A mother and two children receiving Aid to Families with Dependent Children will see 15% of their total income consumed by PECO. (See, CEPA et al., Stmt., No. 1, p. 24).

It is critical to understand that Mr. Grier calculates the foregoing proportions of income that low-income households will have to spend on electricity by using 4,400 Kwh as the average amount of electricity annually consumed by low-income households. (See, CEPA, et al., Stmt., No. 1, p. 22-23). PECO in turn estimates that its average ratepayer consumes about 6,000 Kwh per year or 500 Kwh per month. In short, Mr. Grier's calculations reflect the fact that low-income households as a group use far less electricity than households which are not low-income. If low-income households did not use less electricity but had usage similar to the average PECO ratepayer, low-income households would have had to allocate for electricity even greater proportions of their income to keep PECO's service than indicated by Mr. Grier's testimony.

Given the startlingly high proportions of income that low-income households will have to pay to PECO, one must conclude low-income families can't afford the proposed rates. This is especially true considering the many expenses in addition to PECO's bills, like food, other utilities, housing, medicine, transportation, taxes, and clothing, must be paid. When electric bills reach 8% to 15% of household income, households must make cruel choices between paying the gas bill or the electric bill or going without some other necessity.

3. GEORGE GRIER DEMONSTRATES A STRONG RELATIONSHIP EXISTS BETWEEN INCOME AND USAGE

Household income is directly related to the amount of electricity used. Mr. Grier concluded that 83% of low-income households who do not space heat or heat water with electricity use less than 500 Kwh per month. (See, CEPA, et al., Stmt., No. 1, p. 28 as orally amended at Tr. 3727). Indeed, low-income households use an average of 4.4 thousand Kwh each year, and households with incomes above $35,000 use 8.6 thousand Kwh per year or nearly two times as much. (See, CEPA, et al., Stmt., No. 1, p 26). Also, pages 25 to 30 of Mr. Grier's testimony discuss in detail the evidentiary basis for Mr. Grier's conclusion that a strong relationship exists between income and usage.

This relationship is well illustrated by comparing the prevalence of air-conditioning in households with incomes below 150% of poverty and those with incomes above 150% of poverty. Of households with incomes below 150% of the poverty level 53.9% have no air-conditioning. Only 29.7% of households with incomes above 150% of the poverty level, however, have no air-conditioning. Also, the rate of central air-conditioning is sharply lower in low-income households than in households which are not low-income. (See, CEPA, et al., Stmt., No. 1, p. 30-31; Exhibit GG-10). The very limited income of low-income households provides good reason to believe that, even when a low-income household has an air-conditioning unit, that household uses it

less often than a household with income above 150% of the poverty level which has more disposable income to spend on personal comfort.

4. THE PROGRAMS THAT PECO RELIES ON TO PROTECT LOW-INCOME HOUSEHOLDS' ACCESS TO ELECTRICITY ARE TOTALLY INADEQUATE

The programs on which PECO relies to insure low-income households access to electricity are reaching only 7% of the 226,000 low-income households in PECO's service territory. (See, CEPA, et al., Stmt No. 1, p. 36). Consequently, 93% of PECO's low-income ratepayers receive no assistance paying or reducing their electric bill from the existing programs. Given these figures, PECO's half-hearted contention that energy assistance and conservation programs will protect poor families, thereby removing the need for rate structure reform, is a not-so-funny joke.

The Low-Income Home Energy Assistance Program (LIHEAP) which is the principal state energy assistance program and all other available energy assistance and conservation efforts together assisted only 15,000 out of 226,000 low-income households pay or reduce their electric bill in the latest year. (See, CEPA, et al., Stmt., No. 1, p. 35). If state programs and other programs operated by organizations other than PECO are not considered, the conclusion is that PECO's own programs help less than 2% of low-income customers pay or reduce their electric bill. (See, CEPA, et al., Stmt., No. 1, p. 36; Tr. 3727). In short, PECO's contribution to insuring all families have access to electricity is embarrassingly small.

Indeed, the woeful inadequacy of existing energy assistance and conservation efforts is further evidenced by the fact that PECO shut-off 24% more households in 1985 than in 1984. As Mr. Grier states, the enormous rate increase by PECO will only accelerate the shut-off rate even more. (See CEPA, et al., Stmt., No. 1, p. 36). Plainly, assistance programs that reach merely 7% of low-income households will not provide any real safety from a massive wave of residential terminations by PECO in the coming years.

5. CEPA WITNESS STERZINGER RECOMMENDED REFORMS IN THE COST ALLOCATIONS OF PRODUCTION AND DISTRIBUTION PLANT, THE AMOUNT OF THE CUSTOMER CHARGE, AND THE ALLOCATION OF REVENUE FROM RENTAL PROPERTY

CEPA, et al., also sponsored the testimony of George J. Sterzinger, an energy economist from the National Consumer Law Center. Mr. Sterzinger submitted CEPA, et al. Stmt. No. 2 which advocates that the Commission reform the methods used by PECO to allocate the costs of production plant and distribution plant and the income from rental property.

Mr. Sterzinger recommends that the Commission reject PECO's use of the average of four summer-month coincident peaks to allocate production plant. (See, CEPA, et al., Stmt. No. 2, p. 6-10). Instead, Mr. Sterzinger proposes that the allocation of production plant be done on a basis that recognizes both peak and energy usage. (See, CEPA, et al., Stmt., No. 2, p. 9-10; Exhibit 1). Mr. Sterzinger calculates the impact of this change

on the PECO electric service classes. (See, CEPA, et al., Stmt. No. 2, Exhibit 1). Importantly, Mr. Sterzinger concludes that the PECO cost allocation of production plant overcharges an average residential customer by $35.00. (See, CEPA, et al., Stmt., No. 2, p.9).

Mr. Sterzinger argues that PECO's use of the four coincident peak hours of use to allocate production plant is mistaken, because the level of investment in production facilities depends upon the level of coincident peak and overall energy use. The four coincident peak allocator ignores overall energy use when clearly Limerick I provides mainly base load which will provide services and benefits throughout the year. (See, CEPA, et al., Stmt., No. 2, p. 7-8). Indeed, as Mr. Sterzinger notes, PECO itself estimates Limerick I will produce $207.5 million in energy cost savings which are reflected in the fuel adjustment clause on a Kwh basis. Consequently, Mr. Sterzinger concludes that most of the investment in Limerick I provides year-round service and, therefore, should be allocated on a basis that includes overall energy use.

Mr. Sterzinger states that PECO's prior usage of the four coincident peak allocator is not a persuasive reason to continue the use of the allocator in this case. PECO's filing at issue now represents its efforts to recover costs associated with bringing on line a major nuclear generating facility. Since the design and level of investment associated with any nuclear facility is not compatible with providing only peak service, PECO's use of the four coincident peak allocator to allocate the

production plant of Limerick I is uniquely inappropriate. (See, CEPA, et al., Stmt. No. 2, p. 6, 7-8).

Mr. Sterzinger argues that PECO seriously misallocates distribution plant. In fact, he determines that PECO's method of allocating distribution plant overcharges the average residential customer $159.00 each year. (See, CEPA et al., Stmt., No. 2, p. 13-14; Exhibit 2). This significant misallocation occurs, because PECO greatly overestimates the proportion of distribution plant that is customer-related.

Mr. Sterzinger demonstrates that, while PECO employs the outdated predominant-sized-piece-of-equipment method to establish the portion of Accounts 360 to 369 that are customer related, the Company has no precise definition of predominant. (See, CEPA, et al., Stmt., No. 2, p. 10-11). Additionally, PECO relies on subjective judgment when determining the size and cost of the predominant equipment and the amount of equipment which has a greater size than the predominant equipment. Small changes in "judgment" would produce very different allocations. The Company has no independent, objective data to support those vital conclusions from which large cost responsibility allocations are made.

Mr. Sterzinger also determined that, though PECO has no precise definition of predominant, PECO used to make the customer classification equipment at or above the average cost of equipment in particular accounts and sub-accounts. (See, CEPA, et al., Stmt., No. 2, p. 14). Consequently, PECO classifies equipment capable of serving average or below-average loads as

customer related. Indeed, in the case of some of the secondary overhead-lines, Mr. Sterzinger states that 99% of the equipment is classified by PECO as customer related. (See, CEPA, et al., Stmt., No. 2, p.14). The result is that the below-average loads are classified as customers-related. Indeed, in the case of some of the secondary overhead-lines, Mr. Sterzinger states that 99% of the equipment is classified by PECO as customer related. (See, CEPA, et al., Stmt., No. 2, p.14). The result is that the below-average-use customers pay for equipment that is not necessary to serve them.

Mr. Sterzinger calculates that PECO's arcane and unfair distribution plant allocation method overcharges the average residential customer $159.00. To remedy this discrimination, Mr. Sterzinger recommends that, until PECO does a more detailed analysis of the investment and service accounts, that the distribution plant costs be classified as 50% demand and 50% customer related. (See, CEPA, et al., Stmt., No. 2, p. 13). In the absence of appropriate information, such a split minimizes the risk of exaggerating either the demand or customer classification.

Mr. Sterzinger states that PECO's allocation of Account 454 (Rent from Electric Property) by its A1 (production plant) allocator is improper. (See, CEPA, et al., Stmt., No. 2). Mr. Sterzinger maintains that roughly 50 per cent of the equipment in the account is distribution plant and that another portion of the equipment is transmission-related. (Tr. 3751). Mr. Sterzinger therefore, recommends that the allocator used by PECO in Account

454 be changed. Specifically, he states, "my recommendation is that the distribution equipment serve as the basis for the distribution of roughly 50 per cent of the revenue..." (Tr. 3751).

Mr. Sterzinger also recommends that the customer charge be lowered to $4.00. Mr. Sterzinger explains the basis of this recommendation at pages 13 to 14 and exhibit 2 of his direct testimony.

6. OCA WITNESS OLIVER PROPOSES AN ESSENTIAL NEED RATE THAT WOULD ASSIST THE VAST MAJORITY OF LOW-INCOME CUSTOMERS

In his direct testimony, Mr. Oliver notes that the increase in the price of PECO's service, even under the phase-in plan, will be much greater than the likely increase in households' income. (See, OCA Stmt. No. 8, p. 37). Mr. Oliver states PECO's increase will, therefore, "require that customers steadily increase the portions of their incomes that are dedicated to paying their electric bills." (See, OCA Stmt. No. 8, p. 37). Mr. Oliver recognizes that certain levels of usage are absolutely essential and that households cannot use conservation or other means to reduce such essential use in an effort to absorb PECO's rate increase.

In an effort to price at least essential usage at an amount that helps to make such usage accessible to all, Mr. Oliver proposes three categories of essential use. (See, OCA Stmt. No. 8, p. 41). To insure that customers with usage above

the essential use blocks will not be unduly burdened, Mr. Oliver proposes "that the implementation of this essential use concept be accomplished primarily through the reductions in the Company's requested rate." In this fashion, Mr. Oliver's rate proposal will both protect households access to absolutely essential electric usage and will insure "that no customer will receive a greater increase than that proposed by the Company..." (See, OCS Stmt., No. 8, p. 42). CEPA, et al endorse Mr. Oliver's well-crafted proposal. The proposal certainly will assist the 87% of low-income households that have usage below the "break-even" points in Mr. Oliver's essential use rates.

Finally, Mr. Oliver also states that the energy assistance and conservation programs available to low-income familes are not adequate to insure the affordability of customers essential electric needs. (See, OCA Stmt., No. 8, p. 42-43). Mr. Oliver's conclusion on this point supports Mr. Grier's finding that these programs are totally inadequate.

7. PECO WITNESS WILLIAMS STATES THAT CERTAIN FEATURES OF PECO'S RATE DESIGN ASSIST LOW-INCOME FAMILES MAINTAIN SERVICE AND THAT PECO RELIES ON ASSISTANCE PROGRAMS TO FURTHER PROTECT LOW-INCOME FAMILIES ACCESS TO ELECTRICITY

The following dialogue between Mr Williams and Counsel for CEPA, et al., illustrate Mr. Williams' opinion concerning PECO's rate design and its effect on poor families:

A. We are very much aware of the impact of the cost of our service to people

at the poverty level...

Q. Can you give me a specific example in your rate design how that awareness of the impact on families living at the poverty level is reflected in your rate design.

A. Its maintained by our historic 500 kilowatt hour price blocking, recognizing that that is not as high as it should be relative to the cost of service. It is reflected in the customer charge. We are maintaining these in the same manner that we have done in recent cases. We are maintaining the customer charge far below that which is specified by our cost allocation. (Tr. 1775 and 1776).

Mr. Williams also states that more rate design initiatives (other than the 500 Kwh block and the customer charge) to protect poor families access to electricity would be inappropriate. (Tr. 1776). Mr. Williams maintains that the impact on poor families of the cost of PECO's service is being further addressed by energy assistance and conservation programs. (Tr. 1774). Consequently, the issue of whether or not existing energy assistance and conservation programs can effectively provide low-income families with access to electricity is central to whether more rate design reforms that increase access are necessary.

Mr. Grier's testimony demonstrates all energy assistance and conservation programs on which PECO relies to ameliorate the impact of the explosive rise in proposed electric rates assist only 7% of low-income PECO households pay their bill. (See, CEPA, et al., Stmt., No 1, p. 36). Mr. Williams' reliance, therefore, on energy assistance programs effectively

means that 93% of low-income households will be unprotected from service termination and bill delinquency unless further rate design initiatives (other than PECO's proposed 500 Kwh rate block and customer charge) that will benefit most, if not all, low-income families are adopted.

B. REBUTTAL TESTIMONY

1. THE REBUTTAL TESTIMONY OF WITNESS WILLIAMS CONTAINS SO MANY FACTUAL AND CONCEPTUAL ERRORS THAT IT SHOULD BE ACCORDED LITTLE WEIGHT

Mr. Williams offers usage data of participants in PECO's Customer Assistance Program (CAP) to argue that Mr. Grier's recommendation of limiting any rate increase in the 500 Kwh would not benefit most low-income residential customers. (See, PECO Stmt. 17 A, p. 444-5). Mr. Williams states that 48% of CAP participants use more than 500 Kwh and so would be hurt by Mr Grier's and Mr. Oliver's essential need rate. Unfortunately, Mr. Williams' draws his data from a pilot project program that used no scientific statistical methods to select program participants. For example, PECO did not even employ random sampling when selecting participants and, consequently, CAP participants are a very unrepresentative, small sample of PECO ratepayer households. (Tr. 4195). Moreover, Mr. Williams did not even know whether or not the CAP program had a maximum income level eligibility criteria to prevent non-low-income households from participating in CAP. (Tr. 4194). CAP, therefore, may well

be serving households with incomes above the federal poverty line or the LIHEAP eligibility level. Of course, data drawn from an unscientific, hopelessly biased sample that may well include households that are not defined as low-income is worthless when discussing what proportion of low-income households has usage above 500 Kwh per month.

Moreover, when Mr. Williams concluded that 48% of CAP participants used more than 500 Kwh per month, Mr. Williams did not identify how many of those CAP participants heated water or space heated with electricity. (See, PECO Stmt. 17A, p.5). Of course, both Mr. Grier and Mr. Oliver recognize that households using electricity to heat water or space heat use more electricity. Consequently, Mr. Oliver proposed a 350 Kwh rate block for households which are not water or space heating. He proposed a 700 Kwh block for households which heat water, and 1400 Kwh block for households which use electricity to space heat and heat water.

Another error in Mr. Williams' rebuttal testimony is its failure to recognize that many customers with usage above the essential need blocks (350 Kwh, 700 Kwh, 1050 Kwh, and 1400 Kwh), nonetheless, would experience lower electric bills with essential need rates than without them. The explanation of this fact is simple. The savings customers experience for usage in the essential need block offsets the increased price per Kwh experienced above the essential need block until usage reaches a "break-even" or "cross-over" point. In the case of the 350 Kwh rate block given the assumptions stated by Mr. Oliver in exhibit

BRO-13, customers would receive lower bills as a result of the essential need block until usage reached 532 Kwh. With the 700 Kwh hot water heating rate block, the cross-over point is 1002 Kwh. With the 1400 Kwh space and water heating rate block the cross-over point is 2134 Kwh (in winter months). Mr. Williams' testimony, however, ignores those cross-over points and apparently concludes that a customer with usage of 1 Kwh over the essential need block (for example, 351 Kwh or 701 Kwh if the customer heated water) would pay higher bills as a result of the essential need rate. (See, PECO Stmt. 17A, P.3 and 5). This conclusion is plainly erroneous and misleading as is most of Mr. Williams' rebuttal testimony. This testimony, therefore, should be accorded little weight.

C. SURREBUTTAL TESTIMONY

1. MR. GRIER'S SURREBUTTAL TESTIMONY EFFECTIVELY RESPONDED TO THE REBUTTAL TESTIMONY OF WITNESS WILLIAMS AND CONFIRMED THE FACT THAT 83% OF LOW-INCOME HOUSEHOLDS USE LESS THAN 500 KWH PER MONTH

Mr. Grier concludes that 83.1% of low-income households in the Mid-Atlantic Region (New Jersey, Pennsylvania and New York) who do not use electricity for either space heating or for water heating use less than 500 Kwh per month. (See, CEPA, et al., Stmt., No. 1A, p. 1-2, Exhibit GG-12). Mr. Grier states PECO witness Williams' data which is drawn from the participants in PECO's Customer Assistance Program is unrepresentative of the usage pattern of the 226,000 low-income households living in PECO's service territory. (See, CEPA et al., Stmt., No. 1A, p.

2-3). Indeed, CAP participants in Mr. Williams opinion represent a population that is experiencing "extreme difficulty in being able to make their bill payments." (Tr. 1994).

While CEPA et al believe all low-income households have in varying degrees an ability-to-pay problem resulting from the very large proportion of income (8% or more) that they must spend on electricity, some low-income households are worse off than others. Given Mr. Williams' description of CAP participants ability-to-pay problem, CAP apparently is now serving households with very, very serious payment difficulties. Those "extreme" difficulties may stem from unusually and unrepresentatively high electric usage.

Mr. Grier states further proof that CAP is unrepresentative of low-income households in PECO's service territory is the demographics of CAP. Only 61 out of 708 CAP participant households are elderly. (See, CEPA, et al., Stmt. 1A, Exhibit GG-14). In other words, only 8.6% of CAP participant households are elderly. Based on census data, Mr. Grier states that 33% of low-income households served by PECO were elderly. (Tr. 4282). A ready explanation for why CAP is serving proportionately far fewer senior citizens is PECO's requirement that CAP participants who are homeowners consent to the entry of a lien on their property as a condition for CAP participation. (Tr. 4194-4195).

Identifying more bias in Mr. Williams' testimony, Mr. Grier notes that Mr Williams in his written rebuttal testimony failed to exclude customers using electricity for water or space heating when determining how many customers will be assisted by

the essential need blocks proposed by OCA witness Oliver. (See, CEPA, et al., Stmt., No. 1A, p. 4). Of course, Mr. Oliver proposes increased essential need blocks for water and space heating customers.

Mr. Grier also describes the statistical design failings in the study done by National Analysts to which Mr. Williams referred in his rebuttal testimony. (See, CEPA, et al., Stmt., No. 1A, p. 4-6). These failings include definitions of low, moderate, and high usage that preclude useful analysis. (See, CEPA, et al., Stmt, No. 1A, p.5). To the extent any information can be salvaged from this highly flawed study, the study, Mr. Grier notes, confirms that usage increases with income. (See, CEPA, et al., Stmt., No. 1A. p. 5-6)

Additionally, Mr. Grier demonstrates that Mr. Williams erroneously concludes that all customers with usage above the relevant essential need block would pay higher electricity bills as a function of essential need rates. (See, CEPA, et al., Stmt., 1A, p. 6). For example, a customer that does not use electricity for water heating or space heating would have a 350 Kwh per month essential need block. If that customer used 405 Kwh per month, the customer would, nonetheless, receive a net benefit from the essential need rate, since the savings the customer realized on the first 350 Kwh would more than offset any increased costs for usage from 351 Kwh to 405 Kwh. Indeed, until usage reaches 532 Kwh (the "break-even" or "cross-over" point), the essential need savings outweigh the essential need costs. Mr. Williams' rebuttal testimony completely ignores the fact that

the benefits of the essential need rate extend well above the particular essential need rate blocks.

Mr. Grier recommends that the 13% of low-income households in rate class R with usage above 532 Kwh (the break-even point of Mr. Oliver's 350 Kwh rate block) be placed in PECO's CAP program. (See, CEPA, et al., Stmt. 1A, p. 7). By using the essential need rate to assist the vast majority of low-income customers with usage below 532 Kwh, and by placing high-use, low-income customers in CAP, all low-income households would be protected to some degree from the electric price explosion.

Merging essential need rate reform with CAP (and other programs) is a comprehensive policy initiative. Reliance on energy assistance programs without essential need rate reform is totally inadequate. Mr. Grier notes that the price of households fuels increased by 73% between 1979 and 1985. (See, CAP, et al., Stmt., No. 1A. p. 8; Exhibit GG-16). Unfortunately, between 1979 and 1985, Low-Income Home Energy Assistance Program (LIHEAP) grants fell by 9.3%. This downward trend sharply accelerated from 1985 to 1986 when LIHEAP average grants declined from $289 to $185 or by 35%.

Given these grim trends (sharply rising utility prices and sharply falling energy assistance subsidies), Mr. Grier indicates that the Commission has a crisis on it hands. That crisis is low-income families' inability-to-pay their electric bills. These families are getting priced out of the electric "market".

The access crisis confronting this Commission and low-income families is particularly acute in the PECO service territory. Electric rates are already high and PECO's proposal in this case will send them spiraling higher still (Tr. 3746). Mr. Grier states that PECO's terminations increased by 24% in the space of one year (comparing January to September 1984 with January to September 1985). (See, CEPA, et al., Stmt., No 1. 1A, p. 8). Amazingly, and indicative of the unique crisis in PECO's service territory, PECO now performs two-thirds of all the residential electric terminations carried out by all electric utilities in Pennsylvania. (See, CEPA, et al., Stmt., No. 1A, p. 8). In this light, Mr. Grier concludes:

> Unless rate relief is targeted in a way that protects as many of the 226,100 low-income ratepayer households as possible (containing nearly 600,000 persons) living in PECO's service territory, it is painfully obvious, given the magnitude of the rate increase, that more and more low-income customers will become delinquent in the coming years. Unfortunately, it is also very likely that the number of low-income families suffering termination of service will increase unless a major rate structure initiative like Mr. Oliver's proposal is adopted. The choice is clear and stark.

(See, CEPA, et al., Stmt., No. 1A, p. 7).

2. OCA WITNESS BRUCE OLIVER'S SURREBUTTAL TESTIMONY UNDERSCORED PECO WITNESS WILLIAMS' FAILURE TO UNDERSTAND KEY FEATURES OF OLIVER'S PROPOSED ESSENTIAL NEED RATE

Mr. Oliver finds that the vast majority of PECO customers and especially low-income PECO households would benefit from adoption of his proposed essential need rate. (See, OCA Statement No. 8B, p. 1-2). He also states that PECO witness Williams' rebuttal testimony uses data from PECO's Cutomer Assistance Program that serves a small, unrepresentative group of ratepayers. Moreover, Mr. Oliver argues that Mr. Williams' rebuttal testimony fails to consider the more "widespread nature of customer payment problems that are likely to result if PECO's requested rates are implemented." (See, OCA Stmt., No. 8B, p. 2-3).

Mr. Oliver again appropriately notes the second major error in Mr. William's rebuttal testimony is Mr. Williams' failure to understand that all customers with usage above the various essential need blocks do not experience higher bills. (See, OCA Stmt., No. 8B, p. 3-5, BRO-13). Under the assumptions concerning the amount of increase finally granted to PECO stated in exhibit BRO-13, Mr. Oliver concludes a basic use customer in the 350 Kwh rate block would benefit from the essential need rate until usage exceeds 532 Kwh per month (summer month). A water heating customer with an essential need block of 700 kwh per month would save money as a result of the essential need rate until usage reaches 1,002 Kwh (summer month).

III. LEGAL ARGUMENT

A. PECO HAS NOT MET ITS BURDEN OF PROOF OF SHOWING THAT ITS REQUESTED RATES ARE JUST AND REASONABLE

Section 315 of of the Public Utility Code (66 Pa. C.S.A. §315) places the burden of proof upon the public utility in any proceeding where a public utility proposes a new rate. To meet its burden of proof, a public utility must support its position with substantial evidence. Lower Frederick Township Water Co. v. Pa. Public Utility Commission, 48 Pa. Cmwlth. 22, 409 A.2d 505 (1980). Additionally, an utility's rates must be just and reasonable (66 Pa.C.S.A. 1301). Before judging a rate to be just and reasonable the Commission must balance the interests of the utility and its investors against the interest of the utility's consumers. Pa. Public Utility Commission v. Pennsylvania Gas and Water Company, 492 Pa. 326, 424 A.2d 1213, 1219 (1980). United States Steel Corporation v. Pa. Public Utility Commission, Pa. Cmwlth, 456 A.2d 686, 691-692 (1983). Such balancing of interests must conclude that a rate is not just and reasonable when it is so excessive and high that low-income households within a public utility's service territory will either lose vital service, will be threatened with shut-off, or will become delinquent.

PECO's proposed rates in this case are not just and reasonable because those rates will either endanger access to electric service or deny access to the 226,000 low-income PECO

customers who constitute 20% of all PECO's customers. Many of those households are vulnerable to PECO's unjust and unreasonable proposed rates as a result of not only poverty but also age. Senior citizens comprise 33% of the total low-income households in PECO's service territory.

CEPA, AASC, ACORN, PCIA, and Mr. Bradshaw have proven in this case that PECO's proposed rates will require low-income households to spend impossibly large proportions of their income on electricity. A single-person household will have to spend 14% of their income on electricity. (See, CEPA et al., Stmt. No. 1, p. 24). Fifty-seven percent of such households consist of a senior citizen. A mother and two children receiving Aid to Families with Dependent Children (AFDC) would have to spend 15% of their income on electricity to avoid being delinquent in payment and eventually shut-off. Spending every month so much to prevent PECO from shutting off vital electric service is impossible.

As Mr. Grier demonstrates, household budgets of low-income families cannot absorb PECO's proposed rates. Without even including the increased monthly cost of PECO service under PECO's proposed rates, Mr. Grier proves that low-income-single-person-homeowner households will have a mere $2.00 left after paying just food and shelter expenses. Obviously such households can't afford PECO's proposed rates that will, on average, cost low-income ratepayers another $13.00 a month. (See, CEPA et al., Stmt., No. 1, p. 23). Single-person-renter-ratepayer households have a $26.00 per month deficit when one subtracts again just

their shelter and food expenses, and before adding the increased cost of electricity represented by PECO's proposed rates. Indeed, low-income-homeowner ratepayers of all household sizes only have $52.00 left per month after only shelter and food expenses are paid. (See, CEPA, et al., Stmt., No. 1, p. 23). That $52.00 must cover clothing, transportation, medicine, PECO's rate increase and more, but that's not possible.

Given the above data, PECO's proposed rate increase of 28% would establish rates that would be completely unjust and unreasonable. Low-income ratepayers who represent 20% of all PECO ratepayers and 30% of all PECO ratepayers living in Philadelphia, at the very least, would have imperiled their access to electricity by such rates. So many families would be shut-off that PECO's proposed rates pose a serious threat to public health and safety (especially to the health and safety of the 33% of low-income households who are senior citizens).

Indeed, before any rate increase is implemented, PECO is already terminating nearly 42,000 households a year. In 1985, PECO shut-off 24% more households than it did in 1984. Amazingly, in 1985, PECO carried out approximately two-thirds of all residential electric shut-offs in Pennsylvania. (See, CEPA, et al., Stmt., No. 1 A, p. 8). Consequently, PECO's enormous proposed rate increase can only make more grave the existing serious threat to access.

While CEPA et al has proven that PECO's proposed rates will deny or jeopardize electric service to low-income households, PECO has little or no proof that low-income families

will maintain access to electricity if PECO's rate proposal is implemented. PECO certainly has not offered substantial evidence. Consequently, its proposed rates cannot be judged to be just and reasonable.

To the extent that PECO has offered any proof that poor families will still have access to electricity under PECO's proposed rates, PECO points to some energy assistance and conservation programs. Yet, these programs which include the Low-Income Home Energy Assistance Program (LIHEAP) assist only 7% of PECO's low-income customers to pay or reduce their electric bills. 93% of low-income households receive no assistance from the programs on which PECO relies to keep electricity universally accessible. (See, CEPA et al., Stmt. No. 1, P. 31-36). Even PECO's own witness, Mr. Williams, indicated that these programs were now inadequate when he characterized the programs as an "excellent start" and said they must "proceed and advance and be expanded". (Tr. 4189). Unfortunately, LIHEAP which is easily the largest and most important energy assistance program decreased its average grant from $289 to $185 in 1986. (See, CEPA et al., Stmt., No. 1A, p. 8).

Even a cursory review of the record, therefore, produces the conclusion that PECO has not offered substantial evidence that electricity priced at its proposed rates will be accessible to low-income families. PECO as a result has not met its burden of showing its proposed rates are just and reasonable.

1. IF THE COMMISSION ADOPTS PECO'S PROPOSED RATES OR SETS RATES AT A LEVEL THAT HAS THE EFFECT OF DENYING LOW-INCOME HOUSEHOLDS ELECTRICITY, THE COMMISSION WILL UNCONSTITUTIONALLY DENY LOW-INCOME FAMILIES EQUAL PROTECTION OF LAW

PECO's proposed rates are so high that those rates will create two classes of residential customers. Those categories are those who are unable to pay the rates and who will be shut-off or threatened with shut-off and those who have sufficient income to pay the exorbitant price of electricity. In particular, the 20% of PECO customers with incomes below 150% of the poverty level have been shown to have inadequate incomes to absorb PECO's proposed rates and will either be shut-off in even higher numbers or be threatened with shut-off.

Adoption by the Commission of PECO's proposed rates or other rates that would have the effect of denying low-income households electric service would deny low-income families an important interest. The United States Supreme Court has stated:

> Utility service is a necessity of modern life; indeed, the discontinuance of water or heating for even short periods of time may threaten health and safety.

Memphis Light, Gas and Water Division v. Craft, 436 U.S. 1,19 (1978). Whenever an important interest is denied a class, the Pennsylvania Supreme Court has held that an intermediate standard of review is appropriate. James v. Southeastern Pennsylvania Transportation Authority, 477 A. 2d 1302 (Pa. 1984).

> This standard of review is characterized by the following techniques: (1) requiring that the governmental interest asserted be an important one, though not compelling as is required in a strict scrutiny review...(2) requiring that the governmental classification be drawn so as to be closely related to the objectives of the legislation...(3) requiring that a person excluded from enjoyment of an important right or benefit because of his membership in a class be permitted to challenge the denial on the grounds that his particular denial would not further the governmental purpose of the legislation.

Given the rate structure reforms proposed by CEPA et al, the Commission when setting just and reasonable rates must or need not set rates at a level that will deny or threaten low-income households electric service. As a consequence, the Commission's interest in setting just and reasonable rates need not be achieved by creating two classes of customers: those with service and those without service as a result of an inability to pay exorbitant rates.

2. THE PUBLIC UTILITY COMMISSION HAS THE LEGAL AUTHORITY TO IMPLEMENT AN ESSENTIAL NEED RATE OR OTHER TARIFF MODIFICATION INTENDED TO BENEFIT LOW INCOME CUSTOMERS WITH ABILITY TO PAY PROBLEMS

Historically, the PUC has been granted broad discretion by the appellate courts in rate structure determinations. In a recent opinion, the Commonwealth Court continued its approval of broad Commission power in the rate structure area. Citing Peoples Natural Gas Co. v. Pa. Public Utility Commission, 47 Pa.

Cmwlth. 512, 533, 409 A.2d 446, 456 (1979), the Court noted:

> ". . . the establishment of a rate structure is an administrative function peculiarly within the expertise of the [PUC]." As the Supreme Court has explained, ". . the power to fix just and reasonable rates imports a flexibility in the exercise of a complicated regulatory function by a specialized decision making body. . " Pennsylvania Public Utility Commission v. Pennsylvania Gas and Water Co., 492 Pa. 326, 337, 424 A.2d 1213, 1219 (1980), cert. denied 454 U.S. 824, 102 S.Ct. 112, 70 L.Ed. 2d 97 (1981). Thus, if the PUC's findings are supported by substantial evidence, which has been defined as, ". . .that quantum of evidence which a reasonable mind might accept to support a conclusion," Norfork and Western Railway v. Pa. Public Utility Commission, 489 Pa. 109, 128, 413 A.2d 1037, 1047 (1980), this Court has no choice but to affirm.
>
> Philadelphia Electric Company v. Pa. Public Utility Commission, 470 A.2d 654, 656 Pa. Cmwlth. (1984).

In U.S. Steel Corporation v. Pa. Public Utility Commission, 37 Pa. Cmwlth. 173, 390 A.2d 865 (1978), the Court specifically approved the Commission's exercise of its "flexible limit of judgment in fixing rates" to hold low use residential class customers exempt from a large portion of a rate increase where the customers with this type of usage would be especially hard hit:

> We see no reason why in times of stringency the utility might not propose, and the Commission might

> not approve, rates for residential users less than the rates which an allocation of large inceases in necessary revenues by a strict application of cost of service studies would suggest. (Supra, 871).

In Philadelphia Electric Co. v. Pa. Public Utility Commission, 470 A.2d 654, Pa. Cmwlth. (1984), the Court approved a Commission rate imposing a surcharge on users of outdoor gas lighting which was intended to provide an incentive for recurtailment of such use of natural gas. The PUC's decision was not based upon any cost of service principles but was justified for the following reasons:

1. Natural gas is a relatively inefficient fuel for lighting purposes.
2. Gas lights operate 24 hours a day.
3. electricity, which can easily be controlled, is much more efficient for lighting.
4. The cost of existing gas supplied is increasing and the cost of new supplies is even higher.

Supra. at page 656.

The clear trend in the case law over many years has been to uphold the Commissions broad discretion in the rate structure area. It has not been enough for one class of customers to establish a mere variation in rates among classes of customers. Building Owners and Manager's Association v. Pa. Public Utility Commission, 470 A.2d 1092, Pa. Cmwlth. (1984).

> Differences in rates between customer classes based on such

> criteria as the quantity of electricity used, the nature of use, the time of use, or the pattern of use are "not only permissible but often are desirable and even necessary to achieve reasonable efficiency and economy of operation." United States Steel Corporation v. Pa. Public Utility Commission, 37 Pa. Cmwlth. 173, 190, 390 A.2d 865, 873 (1978).
>
> Supra, p. 1097.

For these reasons, CEPA respectfully submits that the Commission has both the discretion and the well established legal authority to implement an inverted or other tariff modification, either cost justified or non-cost justified, based upon substantial evidence, which is intended to provide assistance to low income persons in paying their electric bills.

IV. CONCLUSION

For all the foregoing reasons, CEPA, et al., request that the following findings of fact and conclusions of law be made.

A. Findings of fact

(1). That 226,00 households with incomes at or below 150% of the poverty level live in PECO's service territory.

(2). 20% of all PECO households have incomes at or below 150% of the poverty level.

(3). 30% of all PECO households living in Philadelphia have incomes at or below 150% of the poverty level.

(4). 33% of all PECO households with incomes at or below 150% of the poverty level are senior citizens (65 years or older).

(5). PECO terminated 24% more residential households in 1985 than in 1984.

(6). PECO did 66% of all residential electric terminations conducted in Pennsylvania during 1985.

(7). 83% of low-income households who do not use electricity to heat water or space heat use less than 500 Kwh per month; 87% use less than 532 kwh per month.

(8). That households with incomes of less than 150% of the poverty level will have to spend 8% to 15% of their total income on electricity if PECO's proposed rates are adopted.

(9). Low-income households' budgets are already strained by current shelter and food expenses.

(10.). Low-income households' budgets cannot absorb the increased cost of electricity that will result from PECO's proposed rates.

(11). Energy assistance and conservation programs on which PECO relies to insure that low-income households have access to electricity assist 7% of low-income households to pay or reduce their electric bill.

(12). Energy assistance and conservation programs on which PECO relies to insure that low-income households have access to electricity do not assist in any way 93% of low-income households to pay or reduce their electric bills.

(13). The Low-Income Home Energy Assistance Program (LIHEAP) decreased its average household grant from $289.00 to $185.00 in 1986.

(14). The average annual income of a household with income below 150% of the poverty level is $7,826.

(15). 60% of low-income households consist of either 1 person or 2 persons.

(16). 57% of single-person-low-income households consist of senior citizens.

(17). PECO improperly allocates Account 454 on the basis of production plant.

(18). 50% of account 454 should be allocated on the basis of distribution equipment.

(19). PECO's use of the four coincident peak method to allocate production plant overcharges residential customers by $35.00.

(20). PECO uses employee judgment to determine what is the predominant sized piece of distribution plant.

(21). PECO's method of allocating distribution plant classifies too much distribution plant investment as customer related.

(22). PECO's method of allocating distribution plant overcharges residential customers by $159.00 per year.

B. Conclusions of Law

1. PECO has not met its burden of proof to show that its proposed rates are just and reasonable.

2. PECO'S proposed rates would seriously harm low-income households by threatening their access to electricity or denying their access to electricity and, therefore, those rates are not just and reasonable.

3. The Public Utility Commission has the legal authority to adopt the essential needs rate as proposed by the Office of Consumer Advocate and CEPA et al.

Respectfully submitted,

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SECRETARY'S OFFICE
Public Utility Commission

Mr. Jerry Rich, Secretary
Pennsylvania Public Utility Commission
North Office Building
Commonwealth and North Streets
Harrisburg, Pennsylvania 17120

RE: Pennsylvania Public Utility
Commission v. Philadelphia
Electric Company
Docket No. R-850152

Dear Secretary Rich:

Enclosed for filing with the Commission please find the orginal and nine copies of CEPA, et al's Main Brief in the above action.

The Main Brief will be served on all parties as demonstrated by the attached certificate of service.

Sincerely,

John Hanger

John Hanger,
Counsel for CEPA, et al

DOCUMENT FOLDER

JH/md

Enclosures

CEPA et al's Schedule of Exhibits

1) CEPA Trial Exhibit No. 1: January 7, 1986

2) CEPA Statement No. 1: February 20, 1986

3) CEPA Statement No. 2: February 20, 1986

4) CEPA Statement No. 1A: March 10, 1986

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Public Utility Commission

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I hereby certify that the attached Main Brief of CEPA, et al. was served by first class mail or express mail on April 3, 1986 or by hand delivery on April 7, 1986 on the following:

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Re: Philadelphia Electric Company,
Docket No. R-850152

Dear Secretary Rich:

Enclosed herewith for filing in the above-referenced docket please find an original and nine (9) copies of the Initial Brief of United States Steel Corporation.

Please acknowledge receipt of the enclosures by having the extra copy of this transmittal letter time-stamped and returned to me in the enclosed self-addressed envelope.

Very truly yours,

R. Caminero/mab

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Enclosures

cc (w/enc.): All Parties of Record

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Public Utility Commission

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

POCKET
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PENNSYLVANIA PUBLIC UTILITY
COMMISSION, et al.

R-850152

v.

PHILADELPHIA ELECTRIC COMPANY

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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PENNSYLVANIA PUBLIC UTILITY
COMMISSION, et al.

R-850152

v.

PHILADELPHIA ELECTRIC COMPANY

INITIAL BRIEF
UNITED STATES STEEL CORPORATION

I. INTRODUCTION

On September 27, 1985, Philadelphia Electric Company ("PECO") filed Supplement No. 15 to Tariff Electric-Pa. P.U.C. No. 26, to be effective November 27, 1985. Supplement No. 15 was designed to produce an increase in PECO's electric revenues of approximately $670,700,000, or 28.2% of test year revenue. The proposed increase would reflect an actual base rate increase of approximately $878,200,000, offset by an estimated energy cost savings of $207,500,000.

By an Order, the Commission initiated an investigation into the justness, reasonableness and lawfulness of Supplement No. 15. The Order did not expressly allow PECO's new rates to take effect as requested; accordingly, Supplement No. 15 was suspended by operation of law pursuant to 66 Pa. C.S. Section 1308.

A pre-hearing conference was held before Administrative Law Judge Joseph P. Matuschak (hereinafter referred to as "the ALJ"). Pursuant to the schedule established as the pre-hearing conference, hearings were held regarding the proposed increase.

United States Steel Corporation ("USS") owns and operates a large steel production and distribution facility located in Fairless Hills, Pennsylvania and known as USS's Fairless Works. The Fairless Works receives its sole supply of purchased electricity from PECO under Rate HT (high tension).

USS filed a complaint, against Supplement No. 15, alleging that Supplement No. 15 would result in rates and charges to USS which were unjust, unreasonable and discriminatory, in violation of law. USS's complaint was consolidated for hearing with Commission's own investigation of Supplement No. 15 and numerous other complaints. USS participated in the proceedings in this matter and co-sponsored testimony of expert witnesses in conjunction with the Philadelphia Area Industrial Energy Users Group ("PAIEUG").

II. SUMMARY OF ARGUMENT

The Commission should reject PECO's phase-in proposal and, instead, use a six-year averaging approach. The Commission should permit PECO to include only 50% of Limerick common plant in rate base and should apply sinking fund depreciation to the Limerick unit. PECO should be required to "guarantee" its estimated Limerick fuel savings to customers and a 65% or better capacity factor for Limerick. The Commission should take off any reductions in PECO's revenue requests proportionately from each year's phase in revenue requirements; it should disallow interest on the deferred revenue requirements.

The Commission should reject PECO's cost of service study and adopt Dr. Bloom's corrected study. It should direct PECO to file updated cost-of-service studies. The Commission also should direct PECO to allocate any revenue increases on a zero-fuel basis and in the manner recommended by Mr. Pollock. Finally, it should order changes in the design of Rate HT to more closely align the pricing of that rate with costs.

III. ARGUMENT

A. The ALJ Should Adopt the Recommendations of Witness Falkenberg Regarding Alternate Treatment of the Limerick Nuclear Plant and Reduction of the Proposed Increase.

PECO has proposed to "phase-in" its requested rate increase over a three-year period. Under this proposal, PECO would increase its rates by 9.4% per year until the total increase of 28.2 percent would be reached in the third year. The unrecovered revenue from the first two years of the period then would be collected over a three year period beginning with the fourth year after the initial increase occurs.

USS supports efforts to reduce the "rate shock" from the completion of Limerick Unit I. However, PECO's phase-in proposal has a serious flaw and must be corrected before it can be used in this case. Specifically, PECO's proposal does not reflect the decline in Limerick rate base through depreciation and the increases in deferred income taxes that will occur over the next six years. (Falkenberg, at 7). These changes will have a substantial effect on the Limerick I revenue requirement, decreasing it by over $400 million dollars by the sixth year. (Id.) PECO's proposal does not reflect this decrease in Limerick I costs, and thereby would overcollect Limerick I revenues if no corrective action were taken. (Id.)

It is possible to revise PECO's phase-in proposal to reflect properly the foregoing factors. Mr. Falkenberg performed such a revision, using a six-year averaging approach

analogous to PECO's own approach regarding nuclear fuel assemblies. The result was a substantial reduction in PECO's revenue requirements for each year of the six-year period. (Falkenberg, at 11, Exhibit 1). This revision to the phase-in proposal would provide PECO with the opportunity to collect the necessary Limerick I revenues, but would avoid overcollection of revenue and would supply an incentive to PECO for cost control. (Falkenberg, at 12).

PECO also erred by including 100% of Limerick common plant in its rate base. The Commission should reduce this amount to only 50% of common plant in order to minimize the cost to rate payers, follow past precedent, and require PECO to follow-up on its implied commitment during the Limerick II investigation. (Falkenberg, at 13-14). Mr. Falkenberg prepared a corrected phase-in on this basis, (Falkenberg, Exhibit 2), and the Commission should adopt his correction.

PECO also should use a sinking fund depreciation technique for the Limerick unit. Such a measure would correct the mismatch under traditional utility ratemaking between the payment for a plant by consumers and their enjoyment of benefits from the plant. (Falkenberg, at 17). With the enormous size of PECO's Limerick investment and related rate increase, this approach is particularly appropriate here. Moreover, it would recognize the stage that PECO will reach in its overall construction program upon completion of the Limerick Units. (Id.) It also would not preclude a change to another depreciation method if PECO's financial circumstances

change and so dictate. (Falkenberg, at 19). Mr. Falkenberg originally recommended the use of a 6% sinking fund rate, which approximates PECO's own estimate of the long-term inflation rate. (Falkenberg, at 18). After reviewing certain testimony and calculations submitted by PECO about sinking fund depreciation, Mr. Falkenberg stated that he would be willing to support a slightly revised approach, if the Commission elected to use it. (Falkenberg Surrebuttal, at 2).

PECO's case rests in part upon the assumption that an estimated energy cost savings of $207,500,000 will occur and will offset a portion of the proposed base rate increase. It is an understatement to say that there has been substantial controversy over the wisdom of PECO's investment in the Limerick Plant and whether that plant ever will produce a net economic benefit to consumers.[1/] There is considerable exposure of consumers to the possibility that the fuel savings from Limerick will not be as sizable as PECO projects. Given this uncertainty and the fact that it was PECO's choice to construct Limerick, the Commission should require PECO to "guarantee" that its customers will receive the full benefit of PECO's estimated fuel savings through the rates that they pay. In order to do so, the Commission should also require PECO to "guarantee" the capacity factor for Limerick assumed in its fuel savings calculations. (Falkenberg, at 20-21).

---

1. This controversy continues. Mr. Falkenberg concludes that "Limerick Unit 1 will not produce economic benefits to consumers over the life of the plant, . . ." (Falkenberg, at 24).

Mr. Falkenberg performed an independent lifecycle analysis of Limerick I, using PECO's study with certain modifications. (Falkenberg, at 30-32). The results of that analysis were that Limerick I is not cost effective and will cause $1.2 billion in higher rates over its life. (Falkenberg, at 32). In light of this conclusion, the Commission should require PECO's shareholders to bear a part of the negative consequences of PECO's investment decision.

There is, of course, obvious concern about both the need for fairness to PECO's ratepayers and the need to maintain PECO's financial viability for the future. Recognizing these competing considerations, USS suggests that the Commission adopt Mr. Falkenberg's proposals (1) "that any revenue reductions in PECO's requests . . . be taken off proportionably from each years phase-in revenue requirements," and (2) "that no interest be allowed on the deferred revenue requirements, . . ." (Falkenberg, at 33). These proposals would strike a reasonable and necessary balance in PECO's rates.

The result of the modifications that USS supports would be a $404,000,000 rate increase over six years, with $135,000,000 in 1986.[2/] (Falkenberg, at 57). At the same time, PECO should "guarantee" operation of Limerick at a 65% or better capacity factor and $207,500,000 in fuel savings to consumers.

---

2. These figures would change slightly if the Commission chose the alternative sinking fund approach. (Falkenberg Surrebuttal, at 2).

B. The Commission Should Adopt the Recommendations of Witnesses Pollock and Bloom Regarding Cost-of-Service, Revenue Allocation and Rate Design.

The question of revenue allocation, i.e. the distribution of revenue requirements and their rate increase components among the various classes of customers served, is a basic and highly important part of any rate proceeding. A long-standing concept of equitable revenue allocation is that revenue responsibility should be allocated among customer classes on the basis of cost-of-service. That is, where an overall revenue requirement for the utility is found to be appropriate, an equitable, impartial way to apportion the responsibility for meeting that requirement is to ascertain the cost to the utility of serving each rate class and to set the class revenue requirement equal to that cost. This concept also results in rates which track the utility's costs as customer consumption patterns change, thereby furthering the utility's earnings stability.

The concept of setting rates equal to cost is basic and intuitively equitable. However, opinions differ about the correct ways to measure the costs attributable to service to particular rate classes, or even the different components of a rate class. Therein lie many of the controversies over revenue allocation. Further requirements to set rates for different rate components to recognize differences in costs under different service conditions, such as differences in voltage

levels, require additional analyses to develop reasoned and logical cost criteria for the specific rate design implemented.

This case is no different than numerous of PECO's recent rate cases in that there has been considerable debate about PECO's method of measuring its cost-of-service and designing its rates. USS has supported PECO's four coincident peak ("4CP") cost-of-service study in the past. The Commission has found the 4CP study to be satisfactory in repeated decisions. Nevertheless, there are specific problems with the 4CP study in this case which require that modifications be made to it. Mr. Pollock and Dr. Bloom, testifying on behalf of PAIEUG and USS, detailed these modifications and the reasons for them. They made specific cost-of-service, revenue allocation and rate design recommendations. The Commission should adopt their recommendations.

1. The Commission Should Not Use PECO's 4CP Study to Determine Class Revenue Allocation and Rate Design.

PECO's 4CP study in this case suffers from two major problems with the demand allocation factors. The first problem is failure to recognize the effect of the cooler than normal weather during the summer of 1984 on PECO's temperature-sensitive load. (Pollock, at 3). The second problem is failure to distinguish between firm and curtailable service within the HT class. (Pollock, at 4). This results in a mismatch between costing and pricing for such service, with an understatement of the HT class rate of return. (Pollock, at 4-5).

It is possible to correct PECO's cost-of-service study by adjusting for the weather problem and by removing that part of the HT class' coincident demand associated with curtailable service. Dr. Bloom made such adjustments in his cost-of-service study. The differences between PECO's results and Dr. Bloom's results are set forth on Exhibits JP-1 (_____), Schedule 1, pages 1 and 2. Dr. Bloom's results show that instead of being below system average rate of return, as portrayed by PECO's study, the HT class is essentially at system average rate of return when the necessary corrections are made. Moreover, Dr. Bloom's corrected study shows that PECO's proposed rates would push the HT class rate of return 9 points (on an indexed basis) above system average rate of return. There is no cost justification for such treatment of the HT class.

In order to test Dr. Bloom's cost-of-service results, they were compared with the results of prior PECO studies. This comparison revealed that Dr. Bloom's results were "much more consistent with prior PECO 4CP cost-of-service studies than the current PECO cost study [is]." (Pollock, at 8-9. See also, Exhibit MPB-1 (_____), Schedule 1).

As Mr. Pollock pointed out, "PECO's phase-in proposal could remain in effect for up to six years." (Pollock, at 9). The Commission should not set a class revenue allocation for such a potentially lengthy period on the basis of what appears to be an aberrant PECO cost-of-service study. Instead, the Commission should (1) adopt Dr. Bloom's cost-of-service study in this case, and (2) if it approves a phase-in plan, direct

PECO to file periodic updated cost-of-service studies. Under this approach, if rates begin to deviate from costs, the Commission will have the data available to identify the problem and to order corrective action.

The Commission allocated the increase among PECO's customer classes in the last three PECO rate cases on a "zero-fuel" basis, with certain modifications. (Pollock, at 14). This approach is proper in a base rate case, where the increase is driven by non-fuel costs. (Pollock, at 14-15). Here, however, PECO has proposed to spread the increase according to base revenues with the fuel element included. This causes customers in the HT class, such as USS, to bear a greater percentage increase than they should. The Commission should order PECO to return to the modified zero-fuel method of distributing the non-fuel portion of any increase. In doing so, the Commission should set the rate of return of any major customer class at a level equal to not more than 140% of the system average rate of return. Also, the Commission should not exacerbate, and preferably should reduce, the existing interclass revenue subsidies. (Pollock, at 2).

Mr. Pollock developed a recommended interclass revenue allocation which is consistent with the foregoing requirements and would align class revenues more closely with costs than would PECO's proposed allocation. His recommendation is set forth at Exhibit JP-1 (_____), Schedule 5. (Pollock, at 18). The Commission should adopt his recommendation.

2. The Commission Should Modify the Proposed Design of Rate HT.

Cost-of-service principles apply not only to class revenue allocation, but also to the design of individual class rates. Application of these principles to the proposed HT rate indicates that three changes are necessary. First, the tail block energy charge should be lowered. Second, the high voltage discount should be increased. Third, the curtailment credit should be increased. (Pollock, at 21).

The present tail block energy charge recovers a certain amount of demand costs. (Exhibit JP-1 (____), Schedule 7). Ideally, the energy charge should recover only energy costs. (Pollock, at 21). PECO's proposed HT design, however, actually increases the amount of demand costs to be recovered in the tail block energy charge by 100%. (Id.) This percentage increase is even higher than the increase in the demand charge, 76%, and produces a clearly improper rate design. (Pollock, at 22-23). In order to partially correct this problem, Mr. Pollock recommends maintaining the level of demand cost recovery reflected in the current tail block energy charge. The result would be a tail block energy charge of 3.18¢ per kwh, as opposed to PECO's proposed 3.75¢ per kwh. (Pollock, at 23).

The present high voltage discount takes into account only avoided transformation costs to PECO from higher voltage service. It does not reflect demand and energy costs, and possible other non-transformation costs, which PECO avoids

when it provides such service. (Pollock, at 25). Mr. Pollock recommends that the Commission order an immediate increase in the voltage discount for HT customers served at 66,000 volts and higher, by an additional credit of 1% of base capacity and energy charges. (Pollock, at 24). He further recommends that the Commission order PECO to develop the necessary data to refine the high voltage discount for its next rate case. (Pollock, at 26-27).

IV. CONCLUSION

For the foregoing reasons, USS respectfully requests that the Commission adopt the revenue recommendations of Mr. Falkenberg and the cost-of-service, revenue allocation and rate design recommendations of Mr. Pollock and Dr. Bloom.

Respectfully submitted,

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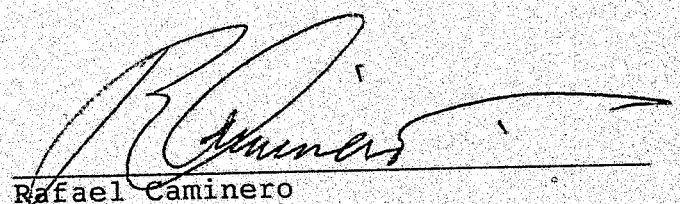
I hereby certify that on this 2nd day of April, 1986, I served a copy of the Initial Brief of United States Steel Corporation on all parties of record by placing the same in the U. S. mail, first class, postage prepaid.



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Attention: Jerry Rich, Secretary

Re: Pennsylvania Public Utility Commission, et al. v.
Philadelphia Electric Company
PUC Docket R-850152

Dear Mr. Rich:

On behalf of our client, the Pennsylvania Business Utility Users Group, we are enclosing herein an original and nine copies of the Main Brief in re the above captioned matter. Copies of same have been served upon all parties of record in accordance with the Certificate of Service.

Kindly acknowledge receipt of the enclosures by signing the copy of this letter and returning it to the attention of the undersigned in the envelope provided.

Respectfully yours,

Alan R. Squires

ALAN R. SQUIRES

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Public Utility Commission

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PENNSYLVANIA PUBLIC UTILITY COMMISSION, ET AL.	:	DOCKET NO. R-850152
v.	:	
PHILADELPHIA ELECTRIC COMANY	:	

MAIN BRIEF ON BEHALF OF THE PENNSYLVANIA BUSINESS UTILITY USERS GROUP

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I. INTRODUCTION

On September 27, 1985, Philadelphia Electric Company ("PECO" or "Company") filed with the Pennsylvania Public Utility Commission ("Commission" or "PUC") Supplement No. 15 to its Tariff Electric-PA PUC No. 26 designed to produce a net increase in the Company's annual electric revenue of approximately 670.7 million dollars based on a future test year ending June 30, 1986. The principal reason given by the Company for its requested increase was to "reflect the increased capital and operating costs, and decreased energy production costs associated with the Limerick Nuclear Generating Station Unit 1 and 100% of Common Plant." (Statement of Reasons-PECO Exhibit #3). While PECO proposed an effective date of November 27, 1985, the Commission instituted its own investigation into the provisions of Supplement No. 15 which Tariffs were thereby suspended by operation of law on November 27, 1985. The matter was then docketed by the Commission at R-850152.

The $670.7 million requested increase reflects $878.2 million in higher cost of service offset by the Company's $207.5 million estimate of the average annual energy cost savings anticipated from the operation of Limerick 1 during the first two years of operation with the proposed rates in effect. PECO so indicated, in its Statement of Reasons, that "The Supplement No. 15 proposed rate increase is necessary to permit recovery of the capital and operating costs associated with Limerick 1, offset by energy production cost savings realized through operation of that unit." (Statement of Reasons-PECO Exhibit No. 3, Page 4).

PECO proposes that the requested revenue increase be distributed uniformly among customer classes based upon class revenue contributions, including fuel costs. However, those classes whose return is above 140 percent of the system average, under present rates, (eg. OP, SLP and SLS) would receive a zero increase, the residential heating class would receive an increase which maintains its 116 percent index of relative return to the system average and SEPTA/AMTRAK rates would be set so as to produce a rate of return equal to the proposed system average. PECO also proposes that the rate classes producing returns in excess of 140 percent of the system average -- all of which are off-peak electric users -- receive an increase in revenue requirement equal to their share of the fuel savings (class energy usage x .750¢/kwh) attributable to operating Limerick Unit 1 as a baseload unit. Thus, all customer class energy usage including those whose electric service is taken during the off-peak period share equally in the fuel saving benefits of Limerick's addition to system production capacity.

All of PECO's customers share equally in the benefits to be derived from operating Limerick 1 as a baseload unit, but not all classes share in the annual capital cost of constructing Limerick in proportion to their use of the facility. PECO has determined customer class rates of return under present and proposed rates based upon a coincident peak (CP) allocation method (PECO Statement No. 24, Exhibit WFS-1). Under this method, all production and transmission plant investment and related expenses

are allocated to classes based upon class contribution to the average of the system's four summer months hourly peaks. Under this approach to cost allocation the causation of Limerick's $3.7 billion contribution to system rate base is indistinguishable from other system production plant.

PECO, through its witness, William F. Sundermeir, presented testimony to explain the Company's class cost allocation and unit cost study and the load characteristics used to allocate demand and energy related costs to classes of service. Mr. Sundermeir explained that the cost by accounts are allocated to classes of service "in accordance with the factors that primarily influence the cost occurrence. For example, production and transmission plant and the related expenses are allocated to classes of service on the basis of the average contribution of each class to the hourly system peaks in each of the four summer months (June through September)." (PECO Statement No. 24, Page 6). The Company classifies all production and transmission expenses as related to meeting those four peak hours, and it allocates all investment in such facilities to classes based upon the measured class demands. The Company's use of this approach is based upon the assertion that "production and transmission plant must be designed to meet the maximum demand requirements imposed on the system by the customers; therefore, it is appropriate that these costs should be allocated on the basis of contribution to those peak demands." (PECO Statement No. 24, Page 6).

Thus, as Mr. Sundermeir stated, "Well, Limerick is a part

of the total production system and the total system and transmission system are allocated on the basis of the four summer CP's. So the extent that any class participates in those four summer CP's they are allocated the production and transmission system, including Limerick. If a class is completely -- if that class has no load at the time of the summer CP's then it would receive no allocation." (N.T. 1933).

Pennsylvania Business Utility Users group ("PBUUG") does not disagree with the proposition that PECO requires rate relief in order to integrate Limerick 1 into its inventory of operational generating plants or generally to its approach to allocating the additional rate revenue among customer rate classifications so as to move toward cost/revenue parity among classes. PBUUG submits, however, that the coincident peak methodology used by the Company to determine customer class cost responsibility does not take into consideration all of the relevant factors which caused PECO to build Limerick nor does it reflect the profound changes in system operation and costs resulting from the addition of Limerick.

Specifically, the Company ignores the fact that the power plant is designed not only to meet coincident peak loads during the four summer months, but also to generate energy throughout the balance of the year. While PBUUG agrees with the Company that the total number of megawatts of capacity on the system may be designed to meet those peak demands, the generation mix which constitutes those megawatts will vary in cost depending upon the year-round energy usage on the system.

If the Commission is persuaded that the PECO cost of service does not properly relate to the causation of cost, and to the extent an acceptable alternative class cost of service indicates relative class rate of return ratios different than WFS-1, PBUUG recommends adoption of the same rate design principles described by Mr. Williams (PECO Statement No. 17, pp. 8-10) except at revenue levels consistent with the adopted cost of service.

As shown in the tabulation comparing the PBUUG and PECO recommended rate increases, (see Appendix I), the Company's rate proposals would extract a higher increase in rates from residential users than would that of PBUUG. By excluding some rates from additional cost responsibility for the Limerick increase, most rates are increased more than is the case under the PBUUG revenue distribution plan.

II. CLASS COST OF SERVICE IS AN ISSUE TO BE ADDRESSED NOTWITHSTANDING THE COMMISSION'S ACCEPTANCE OF THE 4-CP METHOD IN PREVIOUS CASES

"The purpose of a CCOSS (class cost of service study) is to assign the embedded costs of electricity production, incurred largely on a joint basis, among the various customer groups in a manner which is consistent with the engineering standards and economic principles underlying the design, construction and operation of the system" (City Statement No. 3, p. 6).

All parties to this proceeding, including those not proposing a cost of service alternative to WFS-1, have addressed and made an issue of the proper cost of service for assigning the total revenue requirement to the various classes as well as within those classes. The parties are in fairly uniform agreement that the proper method chosen to allocate costs should assign costs based upon cost causation as closely as practicable . However, two opposing theories of allocation based principally upon the interpretation of "causation" have been developed in the Record. The two approaches to cost allocation separate over the issue of whether capacity (production plant) is built only to meet system peak demand requirements (coincident peak) or total system demand. Several parties, including the Office of Consumer Advocate (OCA), have also proposed modification to the Company's method of allocating distribution plant investment. PBUUG adopts no position on this issue. All parties producing a cost of service study, regardless of the methodology proposed for the allocation of production plant, distribute variable energy costs (fuel) to classes based upon relative class energy usage.

III. THE RELATIONSHIP OF SYSTEM PLANNING AND COST OF SERVICE

PBUUG produced a cost of service for the test year ending June 30, 1986, generally predicated upon the capacity planning "model" used by system planners (PBUUG Statement No. 2, Exhibit

RLF-1). The planners' guide to designing the total size and type (base, intermediate and peaker) of system production plant was succintly described by Dr. Michael J. Ileo, when he testified that,

> In the planning and operation of utility systems, a major objective is to minimize total demand (KW and energy (HWH) costs in meeting total system load requirements. In the planning phase, this goal is achieved by determining the least-cost mix of peak, intermediate, and base load generation facilities which, on a combined basis, consists of sufficient capacity (and attendant reliability) to meet system KW demands in peak hours. This least-cost mix will depend on plant specific capital costs/KW and energy costs/KWH, as well as the shape of the annual load duration curve.

(City Statement No. 3, p. 17).

A formal model of the capacity planning process is essential to the identification of the relationship between the amount and pattern of energy use and cost. An analysis of cost that focuses solely on demand ignores the crucial role that supply decisions play in determining total cost of service. Regulated utilities have multiple responsibilities to their customers including, provision of safe, reliable and efficient service.

Reliability of service means reasonable assurance that a utility will have sufficient capacity available to meet demand at the time of system peak, while provision of efficient service requires that a utility identify and construct the combination of generating units that is expected to serve customer demands at the lowest possible cost over time. Overall, an explanation of cost

causation certainly requires an examination of both demand and the capacity expansion decisions made in response to expected demands.

A forecast of future load in combination with a target level of reliability is sufficient to determine the total amount of generating capacity required. If reliability is expressed as a reserve margin at time of system peak, then the only type of capacity that is required to satisfy the reliability target is a combustion turbine. Since combustion turbines generally represent the least expensive means of enhancing reserve margins, the capital costs of these units represent a ceiling on the cost of reliability.

Combustion turbines represent the cheapest form of capacity for purposes of insuring system reliability, but they are characterized by relatively high operating costs and are not designed for continuous operation. On the other hand, baseload and intermediate units are relatively expensive to construct but cheaper to operate. Since the Company's second planning objective is assumed to be the minimization of total costs, the system planner will substitute base load and intermediate capacity for combustion turbines to the extent that fuel cost savings associated with their construction are sufficient to offset the higher capital costs. It is this choice between high construction costs and high fuel costs that creates the necessity for the incorporation of capacity planning critieria and objectives in an analysis of cost causation. If the reasons for construction of high cost capacity, i.e., the avoidance of high operating

expenses, is not considered, then the possibility exists that the cost analyst will adopt the notion that all capacity cost is incurred for the sole purpose of satisfying the objective of system reliability.

Based upon the testimony and extensive cross-examination of the Company's witness, William F. Sundermeir, it is clearly evident that the Company cost of service study (WFS-1) reflects the notion that all capacity is incurred for the sole purpose of satisfying the objective of system reliability.[1]

Under the PBUUG cost of service (PBUUG Statement No. 2, Exhibit RLF-1), only that portion of the Limerick 1 capital costs investment included in rate base estimated to be over and above the cost to PECO of furnishing peaker capacity to insure reliability is allocated to customer classes based upon average class usage (energy). Net investment costs of the remaining PECO production plant, including that portion of Limerick 1 required to satisfy reliability, is allocated to classes based upon system average 4-CPs to account for the summer peaking characteristics of the system load. The rationale for allocating a portion of system production plant based upon average demand factors in the PBUUG

1/ "... as you can probably tell from the method that we chose to allocate that plant that we do it on the basis of capacity because that plant, the size of the plant, the number of megawatts of capacity of that plant, are directly related to the summer peak that the Company has to satisfy" (N.T. 1784).

cost of service parallels the system planning and operation process previously described at page 7. Limerick 1 represents the last production plant added to the system. To the extent that the cost per kw of capacity added exceeds the cost of alternative capacity, the excess capacity cost and excess load capability of the system must be assumed to represent the cost requirement to reduce system energy costs. The UP/UUC approach to allocating Limerick capacity cost to demand and energy rate components is a mirror image of the PBUUG proposal. Similarly, OCA and CEPA rely upon the same interpretation of the relationships between system planning and cost allocation as the basis for allocating a portion of all production plant to class based on class average demands (OCA Statement No. 8, pp. 10-14).

IV. LIMERICK CAPACITY COSTS JUSTIFY SPECIAL TREATMENT AND RECOGNITION IN COST OF SERVICE

Dismissing the fact that 95 percent of the requested rate increase is directly related to the inclusion of Limerick 1 in the test year, the City of Philadelphia criticizes the isolation of Limerick 1 from other system production plant in establishing class cost responsibility. While noting that "tradeoffs between capital and energy costs are recognized in the planning process" (albeit not in the 4-CP allocation process) the City concludes that those "tradeoffs no longer exist once the least-cost generation mix is determined and becomes operational" (City

Statement No. 3, p. 20). This simplistic rationalization that all generation costs are fixed and therefore should be allocated totally to demand begs the question of what causes the cost and how they should be allocated. The proposition that fixed costs are automatically and necessarily demand-related is not correct. Where authorities have taken this view they have done so on the basis of a factual determination that plant investment costs were dependent upon maximum demands rather than energy usage. Even the NARUC Utility Cost Allocation Manual, written in the early 70s, when most if not all power production plant investment was incurred to meet large blocks of demand growth, stated that "Fixed costs are thus demand-related only to the extent that demand is a determinative of necessary plant investment, and of necessary expense to ensure service availability. Certain types of utility production plant are not related (demand-related) to the maximum rate of use." (City Statement No. 3, p. 33).

Limerick 1 is special. The argument that peak responsibility is the only reason new generation capacity is constructed is theoretical in the main and certainly contrary to the reasons cited by PECO to justify the high cost of building Limerick. PECO Constructed Limerick at a cost of $3,620 per kw. It is orders of magnitude more expensive than the average embedded cost of $338 per kw for other plant now in service on the system. Limerick capacity is also five and a half times more costly than other nuclear generators in which PECO shares ownership. At an

average cost of $659 per kw (PBUUG Statement No. 3, p. 4), other PECO nuclear facilities are only marginally more costly than new peaker units ($396./kw -- PBUUG Statement No. 2, p. 2), the substitution of which could certainly have satisfied the PECO/PJM capacity reserve requirements, i.e., reliability.

V. COINCIDENT PEAK COST ALLOCATION FAILS TO ACCOUNT FOR CONSTRUCTION OF BASELOAD PLANT

The underlying principle of the coincident peak cost allocation methodology advocated by PECO is one dimensional -- capacity requirements are determined by the system peak demand, therefore, the cost of all capacity is incurred to meet this one-time load requirement and must, by definition, be allocated on the basis of customer class contributions to system peak demands.

PECO asserts that the 4-CP cost allocation methodology is appropriate for determining class cost responsibility for three reasons; first, "... production plant is installed to satisfy the demand requirements of the system" (PECO Statement No. 24-A, p. 1), and the average of the system's four summer months coincident peaks properly identify the system's maximum demand requirements. Second, any change in the Company's cost allocation methodology such as to a methodology using average demands (energy) to allocate a portion of capacity costs would result in significantly greater costs being allocated to off-peak users. "The effect of

the lower returns for these off-peak services would be to require larger rate increases than those proposed by the Company. Such increases would tend to discourage off-peak use" (Id., p. 3). Third, any allocation other than the coincident peak proposed by the Company would have significant impact on the design of rates HT and PD. Reductions in rate demand charges and increases in block energy charges implicit in cost allocation methodologies that allocate a portion of production plant based upon energy use, "... could ultimately lead to decreased system load factor and the need for more generating capacity" (Id., p. 4).

PECO contends and is supported by the testimony of the Philadelphia Area Industrial Energy Users Group ("PAIEUG") that the 4-CP method of allocation places the cost of additional capacity on the customer causing increased peak demand. Their argument is that off-peak users do not cause the additional capacity, but in fact make the system more efficient by using capacity during non-peak periods thus increasing PECO's load factor. PECO contends that these off-peak customers benefit the system by increasing the load factor of the system and thereby reduce overall costs. Since these off-peak customers do not cause additional capacity demand cost should not be allocated to them. Implicit in the position advocated by the Company and its supporters is that even when a utility needs to meet peak demand, it may construct a baseload unit. Thus, the higher capital cost of a baseload unit, i.e., Limerick 1, is justified by the need to serve peak users and so long as the fuel cost savings ultimately

exceed the cost associated with the additional capacity, building a baseload unit is the proper response.

To adopt the 4-CP allocation method, one must accept the contention that PECO only builds new capacity, i.e., Limerick, to meet peak demand. This clearly cannot be the answer. Mr. Kasum, of the Company's system planning department , stated that, "... the reason for building Limerick is not a reliability reason because it is being put in to reduce the cost of generating in the system and reduced the cost to Philadelphia Electric customers, not to improve reliability" (Docket No. I-80100341, N.T. 3847-8).

In the ALJ's Recommended Decision at Docket No. I-80100341, the fact that the construction of Limerick had been justified on the basis of energy savings and not capacity/peak demand considerations was addressed by the ALJ when he stated:

> Finally, and most significantly, the Company argues that the issue of capacity and reserve margins are not relevant here. As explained by PECO witness Dr. Perl (PECO Statement No. 12, Page 20):
>
> The insensitivity of the need for Limerick to assumptions about load growth and conservation programs may seem somewhat surprising in light of the relatively high reported reserve margins for the PJM Pool now and those forecast through 1990. This result reflects the fact that a substantial fraction of the Pool's existing capacity consists of oil-fired steam plants and combustion turbines. Given the relatively high cost of oil, it is economic to build capacity in excess of load growth and use this capacity to replace existing peaking capacity, to replace some oil-fired steam generation, and to reduce the load factors on the remaining oil generation. Because such substitutions are economic, reserve margins that include all of this oil-fired

> capacity in the existing mix are misleading as a measure of the balance between supply and demand.
>
> * * *
>
> Under these circumstances, it appears that the economic desirability of Limerick's installation is unrelated to capacity levels, since the primary purpose of the plant now is to reduce PECO's dependence on oil-fired generation (Tr. 233-35), and not to supply new or additional load.

See Limerick Nuclear Generating Station Investigation, PUC Docket No. I-80100341, R.D. at Pages 99-100.

Charles W. King, witness for PBUUG, was also in accord with this conclusion when he offered his testimony and stated:

> Peak load growth did not, however, dictate the requirement to build a nuclear plant. If the only consideration was to meet the growth in peak demand, PECO could have constructed combustion turbines to act as peaker units to serve that maximum load. Such combustion turbines would have incurred a fraction of the capital costs required for Limerick. ... The reason Limerick was built as a nuclear plant relates to energy, specifically, the long term objective of reducing the per kwh cost of baseload power. If Limerick performs up to its expected capacity utilization, it will indeed be successful in this function, and ratepayers will enjoy a benefit of $207.7 million in 1986 rising to $1 billion by 1995 and $3 billion by the year 2010. These savings will accrue to users of energy throughout PECO's entire load curve including the off-peak hours. Since the savings relate to energy, the cost associated with nuclear construction should be assigned to energy as well.

(Emphasis added). (See PBUUG Statement No. 1, at Pages 25-26).

All customer classes share in the lower system fuel costs resulting from the full-time utilization of Limerick No. 1 regardless of the time of use of their energy consumption (TPH-2, p. 5). This is acceptable because the decision to construct Limerick was based on requirements for energy throughout the entire load curve, not just at the peak period (PBUUG Statement No. 3, p. 2). If such is the case, (as confirmed by Mr. Kasum, supra) "then it is appropriate to charge the incremental capital costs associated with constructing baseload rather than peaker plants to the off-peak and intermediate peak loads that stimulated that added cost" (Id. p. 3). Coincident peak must be rejected as a comprehensive capacity cost allocator since it totally fails to explain both the amount and mix of capacity required to efficiently meet system demands. The coincident peak method does merit consideration for allocating reliability cost as is the case in the PBUUG cost of service.

PECO also objects to the impact on rate structure that results from cost of service that allocates a portion of capacity costs based on energy considerations. This argument focuses on the allegation that off-peak users would, if energy rates included capacity cost, reduce energy consumption and that this predicated response would be counter-productive to the desired Company objective of stimulating utilization of capacity that would otherwise be idle.

The fallacy of this argument lies in the long run impact that such a pricing strategy has on a Company's generation mix.

Encouragement of off-peak consumption flattens the load duration curve, thereby tilting the optimal generation mix to a higher cost baseload plant. Relatively cheap peaker capacity ceases to be economic because the fuel cost savings resulting from the construction of coal or nuclear units are sufficient to justify the replacement of peaker units. If fuel cost differentials are sufficiently large, then the Company may justify capacity expansion in the face of a substantial excess capacity. It may do so simply by demonstrating that new units will pay for themselves by lowering total fuel expenses by an amount that equals or exceeds the cost of adding capacity. However, such a promotional pricing strategy does not foster the most efficient long run use of utility capital. If the existing capacity mix represents the most economic means of meeting load then the existence of idle capacity during off-peak hours is not an indicator of inefficiency since the units are performing the function for which they were designed.

In addition to the long run impact of an increase in load factor on a utility's capacity mix, consideration must be given to the benefits associated with the existence of protracted periods of slack demand. Typically, planned maintenance outages are scheduled during these periods because large reserve margins enable a company to withdraw units from service without impairing system reliability.

The result of the PBUUG allocation method and its rationalization does not "... misrepresent the way costs are

incurred" as implied by Dr. Ileo (City Statement No. 3, p. 5), nor was PBUUG, "... driven by a desire to shift cost responsibility in an unfair (and economically irrational) manner to an off-peak service such as streetlighting (Id., p. 33).

While the City may object to the findings of the PBUUG cost of service, the study could with equal logic be characterized as one in which capacity costs have been shifted to those customers who benefit most from investment in expensive baseload plant, namely, high load factor customers. Further, it is inconceivable that any customer class should be excused (as proposed by PECO and the City) from any responsibility for what is the electric company's most expensive plant acquisition, particularly where it is clearly evident that all classes, including those taking power during off-peak periods, benefit from the availability of the plant.

VI. CAPACITY/ENERGY SYMMETRY

The City and PAIEUG's fallback position is to criticize the methodology used by PBUUG to allocate variable costs (fuel) on a simple kilowatt-hour basis arguing that the procedure unduly burdens high load factor customers who consume relatively large proportions of their energy during intermediate and off-peak periods when fuel costs are lowest. The crux of this argument is that on the one hand intermediate and off-peak users are allocated greater capacity costs owing to their greater use of energy, but

on the other hand such customers are not accorded equal treatment with respect to the lower fuel cost savings attributable to Limerick.

PBUUG witness Figley in his surrebuttal testimony (PBUUG Statement No. 3, P. 5), conceded that it was, "... possibly appropriate that energy-related costs of Limerick should be assigned according to the proportionate use of the Limerick plant during the peak, intermediate and off-peak periods." Under the procedure followed by PBUUG, as well as all other parties who submitted a cost of service, peak and intermediate peak users were assigned a relatively higher proportion of fuel costs than would be appropriate on a pure time of use allocation basis. If fuel costs are reassigned, "... on a time of use basis to recognize their relatively low level during the off-peak periods, then it would be necessary, in order to maintain symmetry, to allocate the Limerick energy-related costs on a time-of-use basis as well" (Id., p. 6). "If so, then the off-peak customers would receive proportionately a much higher allocation of Limerick plant costs because Limerick is responsible for a relatively greater proportion of off-peak generation." (Id., p. 5). Implementing such a time-of-use differentiated allocation methodology, while more precise than the non-time differentiated methods employed by all parties, is also infinitely more complex and requires more detailed load unit cost data than is currently available from PECO. Had the TOU approach been adopted, "... it is probable that

the increased capital cost allocation to high load factor customers would more than offset the reduced fuel and variable energy cost assignments from a time-of-use costing procedure" since Limerick's capital costs, at least in its initial years, are substantially greater than its fuel savings (Id., p. 7).

VII. PBUUG HT AND PD RATE STRUCTURE PROPOSALS COMPORT WITH APPROVED COMMISSION PROCEDURES

In developing its Rate HT and PD rate designs, PBUUG utilized the identical methodology used by the Company and order of this Commission in RID-438.

Briefly, in order to develop a rate design which will accurately track the utility's cost to provide service to each individual within the class, it is necessary to develop three basic cost components -- demand related, energy related and customer related. Basically, a cost curve is developed for each component. The customer cost component does not vary with usage and would be a horizontal line when graphed on an hours' use basis vs. cost. The energy cost curve increases linearly with increases in kwh consumption, and the demand curve is tied to the coincidence factor/load relationship which recognizes the probability of an individual customer's peak load occuring at the time coincident with the class peak load. It is the cumulative cost curve of the three components demand, energy and customer that dictates the track of revenues required to track the cost increases of each customer.

While the unit input values used to develop the PBUUG rates differ from those used by PECO and derived from their cost of service (WFS-1), the "Bary Curve is the methodology, the skeleton, to which costs are applied and the result is the cost curve." (N.T. 1963). The PBUUG HT and PD rate designs incorporate the same characteristics of the PECO rate proposals as indicated in the following exchange between Counsel for PBUUG and the PECO rate design witness:

Q. And would you agree -- so long as there is a declining block energy charge structure in the HT rate, isn't it true that high load factor customers will pay on average less per kwh than low load factor customers in the same class?

A. Yes.

Q. And isn't this one of the reasons for the three block energy rate for the class?

A. Well, the three block energy rate provides a mechanism to follow as closely as we can the costs for the class. And although a high load factor customer pays a lower rate in cents per kilowatt-hour, that yields a revenue which is consistent with the cost of serving that customer. That is our position.

Q. And I believe you stated in answer to previous questions today that because the high load factor customer aids in the efficiency of the system that's the reason for the declining energy block rate because it's costing less to serve that customer as its load factor increases?

A. As reflected by the cost curve, and the revenue received from that high load factor customer closely tracks the cost to provide service to that customer is the final result.

Q. Assuming, and hypothetically so, that the entire HT class rate increase was to be recovered in energy charges under the declining block energy structure, isn't it correct that the high load factor customers would still pay a lower average cost per kwh than the low load factor customer?

A. Well, in your supposition your revenue from that class would still follow the cost of service curve -- I presume that is your assumption. To accomplish that one would have to have slopes to follow this cost curve and the last block would obviously be the lowest.

A comparison of the Company's current Rate HT vs. the Company and PBUUG Rate HT is outlined below:

	Present Rate HT	Proposed Rate HT	
		PECO	PBUUG
Customer Charge	$220.45	$264.15	$230.20
Capacity Charge	5.37	9.44	6.18
Energy Charge			
First Block	.0739	.0964	.0928
Second Block	.0556	.0668	.0733
Third Block	.0376	.0375	.0541

As shown in PECO Exhibit IV-C-1, pages 10 and 11, under the PECO proposed Rate HT, the seven largest customers served by the rate would receive a total revenue increase of 22 percent vs. 31 percent for the overwhelming majority of the rate class, or a differential of 9 percentage points. Put another way, the average rate increase for low to medium load factor HT customers (including some high load factor users) is 41 percent higher than the impact of the PECO rate HT proposed for the high load factor group of seven customers that dominate the class (average annual revenue of seven largest is $22.6 million vs. $405,000 for all other HT customers).

In contrast, the PBUUG HT rate increase is 33 percent for the seven largest HT customers (those using more kwh per Kw of

demand than other customers served under the rate) vs. 28 for all other HT customers. The impact of the PBUUG rate on all customers regardless of size is more consistent with the principle of rate continuity among a classes' customer population than that proposed by PECO. Moreover, the PBUUG Rate HT structure more clearly reflects the fact that it is the high load factor customers who use Limerick more than any other customer group and who also benefit the greatest in overall lower energy costs.

VIII. PECO HAS NOT JUSTIFIED CONTINUATION OF ITS RATE HT AND PD BILLING DEMAND RATCHET

Mr. Figley testified as to the lack of justification for ratchet billing by PECO. It was explained that the ratchet billing is a rate device applied to demand metered customers (i.e, HT, PD and EP rate classes) which purport to enable the Company to collect the costs of a customer's peak demand throughout the year.

PECO has advanced three reasons in support of the demand ratchet provision for selected rates:

1. The ratchet insures recovery of the class revenue requirement;

2. Ratchet demand billing provides the customer with a pricing signal that the cost which is incurred by the Company to furnish service will be tied to the highest annual demand; and

3. The ratchet billing provision encourages conservation.

In response, PBUUG submits that:

1. The Company has not been able to furnish information as to the amount of rate revenue collected as a result of the imposition of the ratchet provision. In fact, when counsel for the Company asked Mr. Sundermeir "If the Company did not have such a ratchet in those rates, would there be any loss of revenue to the Company?", Mr. Sundermeir replied, "Yes, there would." Mr. MacGregor further questioned "And would the Company have to make any changes in its rate design to reflect that revenue loss?", Mr. Sundermeir replied "Yes; it would necessarily have to increase its demand charges." Clearly, if all that is required to insure revenue recovery is to increase the demand charge, then there is no reasonable obstacle for elimination of the ratchet provision. (N.T. 1864).

2. With respect to PECO's assertion regarding the pricing signal, both Mr. Figley and Dr. Wirtshafter testified to the effect that while there may very well have been sufficient reason for the Company to recommend such a billing demand ratchet when it was first introduced by the Company, it was due to the fact that PECO's peak had then been growing rapidly and its reserve margins were low at a time when it was relying very heavily on peaker generation to meet summer loads. A demand ratchet at that time might very well have furnished a reasonable approach to collect the costs of peak service from low load factor customers. However, with the greatly reduced load growth and now,

with the commercial operation of Limerick 1's additional 1055 megawatts of baseload production, these arguments are no longer valid. Mr. Figley also explained:

> The implicit assumption of the billing demand ratchet is that an individual customer's peak demand is a valid representation of its impact on the Company's load growth and hence, the need to construct all peak related facilities -- generation, transmission and distribution. This proposition, however, does not account for the diversity between the individual customer's peak demand and that of the utility itself. The two may coincide, but on the other hand, they may not. Generation and transmission costs are allocated to HT and PD customer classifications based upon class demands at the time of PECO's system peak demand during each of the four summer months. It is unlikely that a customer's individual peak demand will correspond with those peak demands.

(Emphasis added) (See PBUUG Statement No. 2, at Page 10).

3. With respect to the Company's assertion that ratchet billing encourages conservation, Mr. Figley testified that:

> To some extent it has the reverse incentive. It conveys the signal that all demands up to 80 percent of the customer's established summer peak are virtually cost-free. For example, if a customer experiences a maximum summer peak demand of 1,000 kilowatts, application of the 80 percent demand ratchet virtually invites that customer to establish his consumption pattern in subsequent months so as to reach but never exceed 800 kilowatts
>
> * * *
>
> The Federal Energy Regulatory Commission disapproved a 95 percent demand ratchet on the grounds that it was "... incompatible

with public policy toward energy conservation since it encourages the customers to increase their power sales, no matter how inefficient those uses, in order to utilize all of the demand they will pay for under the ratchet."[1]

See PBUUG Statement No. 2, pp. 11-12).

For the foregoing reasons, PBUUG submits that the Company's justification for the use of the ratchet provision in its rates no longer prevail and therefore urges the Commission to eliminate these provisions from the Company's tariffs.

Respectfully submitted,

Alan R. Squires

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Attorneys for the

PENNSYLVANIA BUSINESS
UTILITY USERS GROUP

DATED: April 7, 1986

NET REVENUE INCREASE ($000)

RATE	PBUUG (1) INCREASE	PBUUG (1) % CHANGE	PECO (2) INCREASE	PECO (2) % CHANGE
R	$121,182	28.69%	$219,206	29.6%
R-H	36,563	28.69	33,003	25.9
OP	7,457	28.69	-	0
POL	438	28.69	-	0
GS	98,948	28.69	102,204	29.6
PD	54,808	28.69	56,630	29.6
HT	247,050	28.69	255,086	29.6
AMTRAK	4,816	15.20	1,471	12.7
SEPTA	4,115	20.47	2,988	14.9
SLP	4,302	28.69	-	0
SLS	-	0	-	0
TL	-	0	-	0
BLI	-	0	2	28.6
TRR	-	0	89	29.1
TOTAL	$670.679	28.12%	$670,679	28.12%

(1) PBUUG Statement No. 2, Exhibit RLF-4

(2) PECO Exhibit TPH-2, Schedule A-5

APPENDIX I

PBUUG SCHEDULE OF EXHIBITS

1.	PBUUG Statement No. 1	2/19/86
2.	PBUUG Statement No. 2	2/19/86
3.	PBUUG Statement No. 3	3/5/86

SCHEDULE OF EXHIBITS

ORIGINAL

LAW DEPARTMENT
15th Floor, Municipal Services Building
Philadelphia, Pa. 19102-1692

686-5251

HANDSEL B. MINYARD
CITY SOLICITOR

CITY OF PHILADELPHIA

April 7, 1986

RECEIVED
APR - 7 1986
SECRETARY'S OFFICE
Public Utility Commission

Mr. Jerry Rich, Secretary
Pennsylvania Public Utility Commission
North Office Building
P.O. Box 3265
Harrisburg, PA 17120

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

Dear Secretary Rich:

Enclosed for filing in regard to the above-captioned matter please find an original and nine (9) copies of the Main Brief Of The City Of Philadelphia.

The City's Main Brief has been served upon the Administrative Law Judge and all parties of record as per the attached Certificate of Service.

Please date-stamp the enclosed extra copy for my records.

Sincerely,

Charles E. Rainey, Jr.

Charles E. Rainey, Jr.
Assistant City Solicitor

enclosure
cc: All Parties of Record

CER,Jr./pk

DOCUMENT
FOLDER

I hereby certify that I have this day served two (2) copies of the following document, Main Brief Of The City Of Philadelphia, upon the following persons by hand delivery or by Federal Express Zapmail which service satisfies the requirements of 52 Pa. Code §1.54:

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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

ORIGINAL

PENNSYLVANIA PUBLIC UTILITY COMMISSION

V.

PHILADELPHIA ELECIRIC COMPANY

DOCKET NO. R-850152

RECEIVED

APR - 7 1986
SECRETARY'S OFFICE
Public Utility Commission

MAIN BRIEF OF THE CITY OF PHILADELPHIA

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I. STATEMENT OF THE CASE

On September 27, 1985, the Philadelphia Electric Company ("PECO" or "Company") filed Supplement No. 15 to Electric Tariff No. 26, increasing annual base rates by $671 million or 28.2%. PECO has proposed to "phase-in" this total increase in three equal amounts of approximately $223.7 million or 9.4% compounded annually over the three-year period June 1986 through June 1989. Those amounts less than the total increase which are deferred and not billed in the first two years would be collected in years four through six (June 1989 through June 1992) under PECO's proposal ("PECO's Rate Proposal").

The Pennsylvania Public Utility Commission ("PUC" or "Commission") ordered an investigation into the justness, reasonableness and lawfulness of PECO's proposal to increase the electricity rates of most of its 1.3 million customers.

The proceedings were assigned to Administrative Law Judge Joseph P. Matuschak who presided over the prehearing conference held on December 3, 1985, and over thirty days of evidentiary hearings. In addition, he presided over four public input hearings. The hearing record closed on March 17, 1986.

Active parties of record to these proceedings included the City of Philadelphia ("City"), the Commission Trial Staff ("Trial Staff"), the Governor's Energy Counsel ("GEC"), the General Services Administration ("GSA"), the University of Pennsylvania and the Utility Users Committee ("UP/UUC"), the Philadelphia Area Industrial Energy Users Group ("PAIEUG"), the Pennsylvania Business Utility Users Group ("PBUUG"), the Consumer Education and Protective Association, et al. (CEPA"), SEPTA/AMTRAK, and the Office of Consumer Advocate("OCA"). Direct, rebuttal, surrebuttal and sur-surrebuttal testimonies were presented by the parties to these proceedings along with numerous exhibits. In addition, thousands of pages of transcript testimony were developed in this case.

This matter is presently before the Administrative Law Judge for a Recommended Decision.

II. SUMMARY OF ARGUMENT

The three (3) principle issues which the City has addressed in these proceedings are: (1) the economic impact of PECO's Rate Proposal and the economic impact of an alternative phase-in plan; (2) the effect of an alternative phase-in plan on PECO's financial viability; and (3) the appropriateness of the 0% increase proposed by PECO for Philadelphia Street Lighting. The City has not addressed the appropriate level of revenues to which PECO is entitled in this case. This issue which includes prudency of Limerick I construction, "used and useful" plant, and excess capacity, is being addressed by other parties to these proceedings. The City, therefore, does not necessarily support the level of PECO's proposed revenue increase but rather believes that any rate increase granted PECO must be appropriate, just and reasonable in accordance with Chapter 13 of the Public Utility Code, 66 Pa. C.S.A. §1301, et seq.

A. Economic Impact and Financial Analysis

The City has presented the expert testimonies of Dr. Arie Schninnar of the Wharton School, University of Pennsylvania, and Mr. Gregory Palast of Union Associates, a consulting firm in Brooklyn, New York. The City retained these experts to study the economic impact of PECO's Rate Proposal and to analyze the effect of an alternative rate plan on the economy and on PECO's financial viability. In connection with this assignment , Dr. Schinnar first examined the issue of whether PECO's Rate Proposal would have an adverse economic impact upon the Philadelphia Standard Metropolitan Statistical Area[1] ("SMSA"

---

[1]The Philadelphia Standard Metropolitan Statistical Area includes the Pennsylvania counties of Philadelphia, Bucks, Chester, Delaware and Montgomery, and the New Jersey counties of Burlington, Camden and Gloucester.

or "Metropolitan Area"). Utilizing a computer model of the Philadelphia Metropolitan Area, Dr. Schinnar found that the region would be adversely impacted. For example, he found that the Philadelphia Metropolitan Area could lose 19,000 new jobs by 1989. City St. No. 1 at 5. Of the 19,000 new jobs lost, the City of Philadelphia could lose 8,000. Id. Dr. Schinnar also found that the City's electric bill which is presently $50 million annually, would increase by $10 million by 1989. Id. at 41. Coupled with a $6 million reduction in the City's expected growth in revenues from wage and earnings taxes, the total cost to City government by 1989 could be $16 million. Id.

Having found that PECO's Rate Proposal would adversely effect the regional economy, Dr. Schinnar then examined the issue of whether the severe impact might be ameliorated by an alternative rate plan. His computer model demonstrated that an electricity rate increase which is commensurate with the rate of inlfation would allow the Philadelphia regional economy to grow at or near its anticipated rate. City St. No. 1A at 2-3. The projected rate of inflation is approximately 4%. City St. No. 1 at 7, 13, 15. Dr. Schinnar therefore concluded that if PECO's rate request is phased-in at or about 4% annually then the regional economy would not be severely harmed.[2] City St. No. 1 at 11-12; See also, City St. No. 2 at 21-22.

Mr. Gregory Palast then examined the issue of whether PECO could maintain its financial viability if it receives its requested rates at or about

---

[2]Dr. Schinnar testified that electric rates could rise slightly above the rate of inflation i.e. up to 5.1% without adverse impact on the regional economy if there were no additional increases in PECO's rates over the coursse of a phase-in period. City St. No. 1 at 7; City St. No. 1A at 2. However in order to soften the impact of intervening rate increases it is recommended that rates be held exactly at the rate of inflation or 4%. City St. No. 2 at 21-22.

the rate of inflation. After examination of PECO's finances, including its ability to borrow needed capital, Mr. Palast concluded that PECO's financial integrity would not be harmed under an alternative rate plan which tracks the rate of inflation.City St. No. 2 at 44-56.

The City, therefore, makes the following recommendations consistent with the above-stated findings of Dr. Schinnar and Mr. Palast:

1) That any increase in rates granted PECO be commensurate with the rate of inflation which is approximately 4%. The 4% annual increase over seven (7) years (June 1986-June 1993) implies an increase in the first year of $95.8 million if PECO's full request is granted.

2) That deferred revenues under proposed rates if granted be collected at an annual rate of 3.4% or $200 million over a ten (10) year period (June 1993-June 2003). The recovery period is slightly longer than the phase-in period so as to ameliorate the potentially adverse impact of Limerick II if it is included in base rates.

3) That PECO not be allowed to collect interest on the deferred revenues because such an allowance would negate the benefits of spreading the rate increase over time.

4) That PECO not be allowed to go beyond the ten (10) year period in collecting its deferred revenues. PECO's customers should be allowed to benefit from their conservation efforts and not be forced to expend those "savings" at a later date.

5) That anticipated fuel savings be guaranteed so that PECO's customers are not required to pay more than the requested increase. Expected fuel savings in the amount of $207 million in each of the first two (2) years (July 1, 1986-June 30, 1988) is reflected in PECO's requested rate increase.

6) That after the first two (2) years, ratepayers realize the fuel saving associated with Limerick I's operation at 65% capacity. The $207 million expected fuel savings in each of the first two (2) years (July 1, 1986-June 30, 1988) would result from Limerick I's operation at 65% capacity according to the Company.

B. Rate Structure/Cost of Service-Philadelphia Street Lighting

In the area of rate structure/cost of service, the City presented the expert testimony of Dr. Michael J. Ileo of Technical Associates, Inc., a consulting firm in Richmond, Virginia. Dr. Michael J. Ileo was retained by the City to analyze the justness, reasonableness, and appropriateness of PECO's proposal not to increase the rates of Philadelphia Street Lighting (rate "SLP"). Dr. Ileo found that SLP's rate of return is presently 174% of the system average rate of return and that this suggests SLP is subsidizing other classes of customers. City St. No. 3 at 4. Dr. Ileo also found that if PECO in its cost of service study had appropriately classified distribution plant as between customer and demand costs and if its energy cost allocations were more reflective of time-of-use considerations, that SLP's rate of return would be even greater than 174% of the system average rate of return. Id. at 4. Dr. Ileo, therefore, believes that a rate decrease would be appropriate for SLP. Id. Taking a conservative position, however, the City recommends that SLP receive no greater than a 0% increase in rates as proposed by PECO.

III. ECONOMIC IMPACT ANALYSIS

A. Economic Impact Is An Important Consideration In The Determination Of Appropriate, Just, And Reasonable Rates

PECO'S application for a $671 million annual increase in rates is the greatest request ever made before the PUC. If granted, PECO's 1.3 million consumers would pay rates that are among the highest in the nation. City St. No. 2 at 23. Section 1301 of the Public Utility Code, 66 P.S. §1301, provides that utility rates must be just and reasonable. The City submits that because of the magnitude of PECO's Rate Proposal, it is extremely important that the PUC consider the economic impact of this request in its determination of appropriate, just and reasonable rates.

Economic impact and just and reasonable rates are inextricably interwined. Indeed, PECO has spent a significant amount of time in its notices to the public, which are a part of this filing, and its testimonies and exhibits justifying its proposed increase by stating that it has attempted to ameliorate the economic impact of the proposed increase. For example, Joseph Paquette testified that "In developing this rate increase application we [PECO] have taken a number of steps to minimize the financial impact on our customers and

the economy of our service territory".[3] PECO St. No.3 at 5. See also, PECO Exhibit No. 3 at 2.

Further, other jurisdictions have long-recognized the importance of considering economic impact in any determination of just and reasonable rates. In Re Ohio Water Service Co.,35 PUR 3d 385 (1960), the Ohio Public Utility Commission stated that:

> One wholly proper consideration in this case as in any other, is the impact of any rate order on the business, governmental, and residential consumers of the regulated utility service.
>
> We cannot in good conscience be a party to anything so disrupting to a business and residential community as a tripling or even a doubling of existing rates for water service.

Id. at 389. Similarly, in Re Millard County Telegraph and Telephone Company, 42 PUR 3d 479 (1961), the Utah Public Service Commission stated:

---

[3]PECO has stated that it has attempted to ameliorate the adverse economic impact of its request by: (1) recovering the full increase over six (6) years; (2) haveing an opportunity to achieve a 15.75% return on equity in lieu of the 16.75% return allowed by the PUC in PECO's last rate case; (3) extending the lives of two coal-fired generating units; and (4) not requesting another base rate increase before September 27, 1987. PECO St. No.3 at 5-6.

PECO's Rate Proposal, however, is not based on an economic impact study of the Philadelphia Metropolitan Area. Tr. 1549-51. PECO has not analyzed the effects of its Rate Proposal on the Philadelphia Metropolitan Area economy. Tr. 1549-51 It's purported steps to ameliorate the impact of its requested rate increase are therefore, arbitrary and inadequate.

An economic impact study of the Philadelphia Metropolitan Area economy performed by Dr. Schinnar of the Wharton Policy Modeling Workshop has established that PECO's Rate Proposal would have a severe and adverse economic impact on the Philadelphia Metropolitan Area despite these steps taken by PECO. These steps taken by PECO, therefore, do not go for enough in relieving the economic hardship which would be caused by rates of the magnitude of PECO's request.

> Although a proposed rate increase for a telephone company was found to yield only a modest overall return on the rate base, it was not allowed in full because it was found to have too severe an impact upon the customers in light of all the circumstances.

Id. at 486. In their consideration of just and reasonable rates, jurisdictions throughout the country have recognized that a utility's proposed rates may adversely effect an area's economy as a whole as well as the individual ratepayer. For example, in New York State Council of Retail Merchants, Inc. v. Public Service Commission, 284 N.E. 2d 1282 (N.Y. App. 1978), the New York Public Service Commission was quoted as having stated that:

> "Repeatedly in recent rate decisions we have stated our intention to hold rates down to the lowest reasonable level, precisely because we realize that energy costs have become oppressive to large numbers of consumers and have a magnification effect throughout the economy."

Id. at 1285. See also, In the Matter of the Application of Kansas Gas and Electric Company, Docket No. 142, 098-U, Kansas State Corporation Commission, (Sept. 27, 1985), Order at 74.

The City submits that it is extremely important to the economic well-being of the Philadelphia Metropolitan Area, that any increase in electric rates granted by the PUC reflect its full consideration of and appreciation for the substantial evidence presented in these proceedings as summarized below that PECO's Rate Proposal would have a severely negative impact on the regional economy. The City further submits that because PECO 's Rate Proposal would be extremely harmful to the regional economy, PECO's application for increased rates cannot be deemed just and reasonable and therefore must be rejected.

B. Dr. Schinnar Has Presented Compelling Evidence of The Potentially Harmful Effect of PECO's Rate Proposal On The Philadelphia Area Economy

Dr. Schinnar, Director of the Wharton School's Policy Modeling Workshop, University of Pennsylvania ("Wharton PMW"), analyzed the economic

impact of PECO's Rate Proposal through use of a computer model of the Philadelphia Metropolitan Area. Dr. Schinnar, an expert in the fields of regional economics, energy management, and computer modeling, developed this model in over a year's time and has named and referred to it as the STARLOC Model. City Statement No. 1 at 3. The STARLOC Model analyzed a wide range of social and economic variables for the Philadelphia Metropolitan Area in relationship to PECO's Rate Proposal. City St. No. 1 at 3-4, Appendix II, See also PECO Exh. 22 ("STARLOC Technical Report"). Dr. Schinnar's model analyzed and quantified the impact of PECO's Rate Proposal on regional employment, people of various occupational levels, people of various income levels, industry, commerce, residentials and City government. City St. No. 1 at 5.

The results of Dr. Schinnar's analysis were that if PECO's Rate Proposal was implemented there would be 19,000 fewer jobs in the Philadelphia Metropolitan Area by 1989 as a result of job growth loss. Id. Of the 19,000 new jobs lost, 8,000 would be lost in Philadelphia. Id. Most of the job loss will occur in the service and wholesale/retail sectors (54%). Id. at 20. The service sectors most affected will be hotels and lodging, health services, advertising and business services, finance, insurance and real estate, and retail trade. Id. at 22. The largest occupational category of new jobs lost will be managerial and clerical (6800 or about one-third of all jobs lost), followed by professional and technical (3500) and service (3000). Id. at 20. Low income households will be more severely affected because their employment opportunities are most dependent on growth in the service sector Id. at 22. The City of Philadelphia's electric bill which is presently $50 million annually, would increase by $10 million by 1989. Id. at 41. Coupled with a $6 million reduction in growth in revenues from wages and earnings taxes due to loss in job growth, the total cost to City government by 1989 could be $16 million. Id.

In summary, Dr. Schinnar testified that PECO's Rate Proposal would significantly slow the rate of growth in the regional economy and thus cause it harm for the following reasons:

1. PECO's Rate Proposal would increase the cost-of-doing business in the Philadelphia regional economy and induce an inflation spiral.

Because of the significant increase in electric rates, manufactures, businesses and institutions would be forced to significantly raise their prices for goods and services in order to offset the significant increase in electric rates. City St. No. 1 at 8-9, 23-24. These entities would consequently have to raise their prices for goods and services still further in order to offset price increases of other goods and services upon which they depend. City St. No. 1 at 23-24. All the while, consumption of goods and services would decline in response to the rate and price increases, causing loss of employment opportunities and revenues. Id.

2. PECO's Rate Proposal would cause a drop in demand for PECO electricity.

The significant increase in electric rates will drive customers to alternative energy sources and energy conservation, thus reducing overall demand for PECO electricity. City St. No. 1 at 8. In order to offset the decrease in demand, PECO would seek to raise rates still further in order to increase revenues. Id. The inflation spiral as described above would continue thus further damaging the economy.

More specifically, Dr. Schinnar testified that the harm to the regional economy would result from a number of factors. For example, one factor would be a loss of consumer purchasing power for goods and services. City St.

No.1 at 22-34. Money which would otherwise be used to purchase goods and services must now be used to pay the increased electric bill. Id. In addition, commercial establishments would increase the price of their goods and services in order to offset the increased electric bill. Id. This would further add to the decline in consumer spending for goods and services. Id. Another factor would be the failure of business and industry to expand due to the increased cost of electricity. Id. The migration of business and industry to areas where the cost of electricity is less expensive would also occur. Id. Other business and industry would not come to the area because of the high electricity rates. Id. These and other factors are discussed at pages 22-34 of City St. No. 1. Ironically, contributing to the slowdown in economic growth will be the decrease in demand for PECO's electricity and PECO's consequent increases in electric rates in order to offset the decline in demand. Id. at 16-17, 24.

The results of Dr. Schinnar's computer analysis as highlighted above, have led him to conclude that PECO's Rate Proposal could not be implemented without harming the Philadelphia Metropolitan Area economy. Id. at 5-6. In order to save the regional economy from being severely harmed, PECO's Rate Proposal must be rejected in favor of a more appropriate, just and reasonable plan.

C. Unrebutted Evidence Presented By Dr. Schinnar Provides Electric Rates Which Track The Rate of Inflation Would Not Harm The Regional Economy And Should Therefore Be Implemented In This Case

Evidence of record cited above establishes that PECO's Rate Proposal would significantly slow the projected rate of growth in the Philadelphia regional economy. City St. No. 1 at 16-17. Evidence also provides that PECO may not receive its requested revenues under its Rate Proposal due to a decrease in customer demand for PECO electricity. Id.

Dr. Schinnar has presented unrebutted evidence that an electric rate increase which tracks the rate of inflation would not harm the regional economy. City St. No. 1 at 7, 12. Under such a rate plan, PECO would also have a greater chance of achieving its requested revenues. City St. No. 1 at 2-3.

In this regard, record evidence establishes that when electric rates approximate the rate of increase of other goods and services (the rate of inflation) then the area economy will continue to grow at or near its projected rate.[4] City St. No. 1A at 2-3. The Philadelphia area economy is projected to grow at an annual rate of approximately 1.9%.[5] City St. No. 1 at 6. Over the course of PECO's three-year Rate Proposal, the cumulative rate of growth in the area's economy would decline from 5.7% to 4.7%. Id. at 16. This 1% drop in growth over three years would cost the Philadelphia Metropolitan Area over 19,000 new jobs.[6] Id. The decline in job growth resulting from PECO's Rate Proposal is clearly severe and unacceptable. It must therefore be rejected in favor of Dr. Schinnar's rate plan which would minimize the harm to the area's economy.

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[4]Price increases which exceed the rate of inflation impede growth in the economy. City St. No. 1 at 8. PECO's proposed 9.4% compounded annual increase exceeds the projected annual rate of inflation by 4.4-5.4%. City St. No. 1 at 13.

[5]The 1.9% rate of growth in the regional economy assumes a U.S. growth rate of 3%. City St. No. 1 at 6.

[6]Assumes 4% annual rate of inflation and 3% U.S. annual growth rate. City St. No. 1 at 16.

Testimony by Dr. Schinnar also provides that PECO has a greater chance of achieving its requested revenues when its rate increase is commensurate with the rate of inflation. City St. No. 1 at 3. This is because "the regional economy is able to sustain sufficiently high growth to benefit PECO's revenue level." Id. Record evidence submitted by Dr. Schinnar further reveals that "past trends indicate that as long as the price of electricity is commensurate with inflation, electricity's share of total energy may grow, further increasing PECO's revenues."[7] Id. For example, assuming 4% annual inflation and 3% U.S. job growth, "a 16% electric rate increase over three years (5.1% annual increase) would result in a 25% revenue gain for PECO without [any] adverse impact on job growth in the Philadelphia region" assuming no additional electric rate increases over the three (3) year period. City St. No. 1A at 2. Taking another example, "assuming 5% inflation, with the [electric rate] increase limited to 18% (5.7% annually) PECO would realize a 29% revenue increase in the third year, still with no ill effects on the economy" also assuming no additional electric rate increases over the three (3) year period. Id.

The projected rate of inflation over the next three (3) years is approximately 4%.[8] City St. No. 1 at 13, 15. The City therefore recommends

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[7]This observation by Dr. Schinnar is supported by testimony given by PECO witness Dr. William Hogan in the Limerick II Investigation at PUC Docket No. I-840381. City St. No. 1A at 3.

[8]Dr. Schinnar testified that a reasonable projection of the rate of inflation over the next three (3) years is 4-5%. City St. No. 1 at 13. The City is recommending that the lower end inflation projection figure of 4% be used for setting rates in this case. This is to soften the economic impact of additional increases in rates which most likely will be requested by PECO during the course of a phase-in plan. City St. No.2 at 21-22.

that any rates granted PECO be phased-in at a rate no greater than 4% compounded annually. City St. No.1 at 7. Thus, if PECO's full request of $671 million is granted in this case, it is recommended that those rates be phased-in over a minimum seven (7) year period (June 1986-June 1993) approximately $95.8 million compounded annually. City St. No. 2 at 21-22, Exh. Gp-7, p.2. In order to ameliorate the potential economic impact of Limerick II if ultimately added to base rates,[9] the City recommends a longer deferred revenue recovery period. Id. at 21-22, 34-35. The City recommends that deferred revenues be collected over a ten (10) year period (June 1993 - June 2003) at 3.4% or $200 million annually.

D. Dr. Schinnar's Findings Of Adverse Economic Impact And Loss In Job Growth Are Supported By PECO's Own Witnesses

Adverse economic impact associated with PECO's Rate Proposal was found not only by opponents of PECO's request but by PECO's own witnesses as well. PECO witnesses Dr. William Hogan , Dr. George Schink, and Dr. Lewis Perl all presented evidence of adverse economic impact in these proceedings. The projections of loss in job growth by Drs. Hogan and Schink are comparable to Dr. Schinnar's 19,000 figure when important missing factors which contribute to loss in job growth such as energy conservation and interfuel substitution, PECO's direct impact on the cost-of-doing business, secondary inflation economy-wide and employment multiplier are added to the calculations of these PECO witnesses.

[9]Limerick II is scheduled to be completed and begin commercial operation in 1991 which is near the end of the City's recommended phase-in plan. City St. No. 2 at 31. The City anticipates that the rates requested by PECO for Limerick II will be of a similar magnitude as those requested in this case and that those rates if allowed by the PUC will similarly require a reasonably long phase-in and deferred revenue recovery period. Id. at 34-35.

City St. No. 1A at 5, 10. Record evidence further reveals that calculation of loss in job growth using Dr. Perl's method results in a projection of new job loss which actually exceeds Dr. Schinnar's by 1, 568. Id. at 12.

1. When Important Factors Are Added To Dr. Hogan's Calculations And Unsupported Assumptions Are Removed Therefrom, His Projection of Loss In Job Growth Is Comparable To That Of Dr. Schinnar

Dr. Hogan characterized the effects of PECO's Rate Proposal as a combination of higher production costs, reduced wages, loss of output, loss of job growth, and the blow of unemployment of present workers. PECO St. No. 37 at 18; City St. No. 1A at 4. Hogan further testified that he has calculated that between 0-3,000 new jobs would be lost. City St. No. 1A at 25. This estimation of loss of job growth is grossly understated, however, for two principal reasons.

First, Hogan's 3,000 job loss figure assumes that employers will reduce wages and salaries in order to offset PECO's Rate Proposal. City St. No. 1A at 8, 25. This assumption is totally unfounded. Id. at 8. It is most unlikely that labor would accept attempts to satisfy PECO's demand for increased revenues by cutting employee wages and salaries.[10] The City also believes that employers would also refuse to cut their own salaries in order to benefit PECO. Thus, loss in new job growth as opposed to a reduction in existing salaries and wages will result from PECO's Rate Proposal.

[10]The City further believes that labor would find unacceptable attempts to satisfy PECO's Rate Proposal through lay-offs and forced early retirements in order to thereby reduce wages and salaries.

Therefore, when Hogan's unfounded assumptions of wage and salary cuts are removed from his calculations[11], his new projection of loss in job growth is 3, 954 or 4,442. Id. at 8.

Dr. Hogan's loss in job growth projection is still below that of Dr. Schinnar's due to Hogan's convenient omission from his calculations of three of the four important contributing factors to loss in job growth. City St. No. 1A at 5-10. The four important contributing factors are: (1) energy conservation and interfuel substitution; (2) PECO's direct impact on cost-of-doing business; (3) secondary inflation economy-wide; and (4) employment multiplier. Id. Dr. Hogan's calculation of job loss reflects his sole consideration of the contribution of PECO's Rate Proposal to secondary inflation economy-wide. Id.

It is particularly curious that Dr. Hogan omitted the factor of interfuel substitition and conservation from his calculation. In the Limerick II Investigation at Docket No. I-840381, Dr. Schink testified that it is important to consider interfuel substitution and conservation when measuring the economic impact of electric rate increases. City St. No. 1 at 6. He specifically stated that "[f]aced with projected increases in electricity prices for the next several years, the effects of energy conservation and interfuel substitute greatly moderate the growth in electricity demand." Id. As previously stated, when demand for PECO electricity is slowed, PECO experiences a decrease in revenues. Consequently, additional increases in rates are requested by PECO

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[11]It should be noted that PECO witness Schink as well as Dr. Schinnar have not assumed wage and salary cuts in their calculations of loss of job growth resulting from PECO's Rate Proposal. City St. No. 1A at 25.

in order to offset the drop in demand. Weakened by these rate increases, the economy as a whole is slowed and new job growth is lost.

When calculations of the other three (3) important factors including PECO's direct impact on the cost-of-doing-business, which Dr. Schink included in his calculation of job growth loss, are added to Hogan's incomplete calculations, the final figure of loss in job growth is comparable to Dr. Schinnar's 19,196. Id. at 5, 10.

2. Dr. Schink's Calculation Of Projected Job Loss Is Also Comparable To Dr. Schinnar's When Omitted Important Factors Are Added To His Original Calculation

Dr. Schink has projected that 3,555 new jobs will be lost as a result of PECO's Rate Proposal. City St. No. 1A at 6-7. Similar to Dr. Hogan, Dr. Schink has conveniently omitted three of the four important factors from his calculation. Id. at 5. However, unlike Dr. Hogan, Dr. Schink has attributed loss in job growth solely to the direct impact of PECO's Rate Proposal on the cost-of-doing business. Id.

Thus, when the three other important factors including secondary inflation economy-wide-which was included in Hogan's calculation of job growth loss-fuel substitution and conservation are added to Schink's calculation the resulting figure is comparable to Dr. Schinnar's projection. Id. at 5, 10.

3. Dr. Perl's Method Results In A Projection Of 20,764 New Jobs Lost

In the recent Lukens Steel case, PECO witness Perl calculated the effect of electric rate increases on job loss. City St. No.1A at 10. Dr. Perl testified in the present proceedings that certain modifications to those

calculations would have to be made in order to derive job loss for this case. Id. at 10-11. Consequently, Dr. Schinnar calculated job loss associated with PECO's Rate Proposal using Dr. Perl's method which was modified in accordance with Dr. Perl's testimony in this case. Id. at 11-12. The figure for new job loss which Dr. Schinnar derived using Perl's method was 20,764. Id. at 12. This projection exceeds Dr. Schinnar's by 1,568 and establishes further corroboration of Dr. Schinnar's estimation of loss in job growth. Id.

4. Dr. Clemente Has Presented On Overly Simplistic Study Which Does Not Lend Anything To This Case And Therefore Should Be Given No Weight

Evidence is said to be relevant or of probative quality if it assists the trier of fact in his determination of whether a thing is more probable than not. McCormick on Evidence, (2d ed. 1972) 436-438. In the present proceedings an issue for determination by the PUC is whether PECO's Rate Proposal will adversely affect the Philadelphia Metropolitan Area economy. The PUC must therefore examine whether evidence submitted in these proceedings lead one to believe that it is more probable than not that PECO's Rate Proposal would adversely impact upon the Philadelphia regional economy.

PECO has presented only one witness in this case, a sociologist, who has submitted a study of economic impact. His name is Dr. Frank Clemente. Dr. Clemente's sociological study consists of his observation of a few metropolitan areas throughout the country. Tr. 4428-29. He did not analyze the Philadelphia Metropolitan Area economy specifically. Tr. 4428-29. He did not question the businesses, industries, governments, and residents who would be affected by PECO's Rate Proposal. Tr. 4416. He did not ask them how PECO's Rate Proposal would affect their budgets and operations. Tr. 4416. Clemente didn't even know the dollar amount PECO is requesting in this case. Tr. 4451. He was not certain PECO had proposed to phase-in rates in this case. Tr. 4451.

He has observed that in some metropolitan areas there has been economic growth despite large electric rate increases. Tr. 4432. He did not know whether they were energy intensive economies or not. Tr. 4473. Clemente did not know whether the manufacturers in those areas were energy consumers or not. Tr. 4473. Surely, such knowledge is necessary to an understanding of why manufacturers in those areas may not have been adversely impacted by a large electric rate increase. Clemente also was not able to say whether the metropolitan areas he observed were comparable to the Philadelphia SMSA. Tr. 4433, 4438. His study is therefore, not relevant to the Philadelphia economy. In other metropolitan areas he has observed economic decline resulting from large rate increases. Tr. 4432. Dr. Clemente concludes from his study that there may or may not be an adverse impact associated with PECO's Rate Proposal. Tr. 4467-68. He implies that we should take our chances.Tr. 4468.

The City submits tht Dr. Clemente's overly simplistic study adds nothing to a determination of whether it is more or less probable that the Philadelphia area economy would be harmed by PECO's Rate Proposal. The lack of prohibitive value associated with the testimony presented by Dr. Clemente and his lack of qualification to rebut an econometric study submitted by Dr. Schinnar, led the ALJ to state the following in response to motions to strike Dr. Clemente's testimony:

> JUDGE MATUSCHAK: If this were a matter before a jury, we would probably adduce to strike the testimony. However, this is opinion evidence which sometimes has weight and sometimes does not have great weight.
>
> We think we in the first instance, and the Commission in the finality, can place the proper weight on Dr. Clemente's testimony. At this point in time we attach very little weight to his testimony.

Tr.4491. The ALJ and the Commission should go a step further and give no weight to Dr. Clemente's testimony.

5. Dr. Clemente's Own Testimony On Cross-Examination Establishes That He Is Unqualified To Rebut The Economic Impact Study of The Wharton School

Dr. Clemente stated that the purpose of his testimony was to "examine the quality of the socioeconomic materials and conclusions of Dr. Schinnar in this proceeding." He has shown that he was not qualified to perform this task. It was necessary for him to evaluate the study of Dr. Schinnar, which he stated he did not understand since he lacked the expertise to do so. Tr. 4412, 4414.

It was not enough for him to look at the end result conclusion of Dr. Schinnar's study in order to accomplish his stated task. Tr. 4490. Dr. Schinnar used an econometric computer model in order to make certain projections with regard to economic growth relative to Philadelphia Electric Company's proposed rate increase. Dr. Clemente admitted that he is not an economist, not an expert in computer modeling, and he's not an expert in the areas of econometrics. Tr. 4406. He was therefore ill-equipped to rebut Dr. Schinnar's testmony.

Dr. Clemente stated that he had no view with respect to the completeness, relevancy or validity of socioeconomic variables which Dr. Schinnar shows in his technical report (PECO Exh. No. 22) in regard to residential energy consumption. Tr. 4414. He was unable to address the reasonableness of demand elasticities of residential electricity consumers shown in Dr. Schinnar's technical report. Tr. 4414. He stated generally that the matters and equations in the technical report fall outside the area of his expertise. Tr. 4415. The technical report provides a complete, detailed and comprehensive documentation of the STARLOC model structure- its calculations, variables and parameters. PECO Exh. No. 22 at I (1). If Dr. Clemente did not have the expertise to evaluate this documentation, then how could he comment on it, which was a part of his stated task in this particular proceeding?

Dr. Clemente did not look at Philadelphia Metropolitan Area specifically, as did Dr. Schinnar. Tr. 4424. He did not look at such things as household earnings, public assistance, employment benefits, age, race, gender, households, number of children, level of education, etc. in evaluating PECO's Rate Proposal as did Dr. Schinnar. Tr. 4418-4419.

Dr. Clemente used essentially the same study and testimony in this case as he has in the Kansas and the New Orleans case. Tr. 4406-07, 4409-10. PECO's Rate Proposal would affect the Philadelphia Metropolitan Area economy specifically. It is therefore necessary to examine the Philadelphia Metropolitan Area specifically. Dr. Schinnar has done this. Dr. Clemente has not. Tr. 4424.

He has not even truly rebutted the bottom line result of Dr. Schinnar's study. Clemente's testimony establishes that although there may be a decline in employment as a result of the electric rate increases, he just can't measure it using his own study. Tr. 4424.

As cited above, the ALJ stated that little weight generally would be assigned to Dr. Clemente's testimony. Tr. 4491. Dr. Clemente has shown himself to be totally unqualified to rebut the testimony of Dr. Schinnar. Therefore, no weight should be given to those portions of his testimony which purports to rebut the evidence submitted by Dr. Schinnar.

E. Intervenor Witnesses King and Grier Provided Further Evidence Of The Potentially Harmful Effect Of PECO's Rate Proposal

The testimony of Charles King on behalf of PBUUG and George Grier on behalf of CEPA, et al. also support the findings of Dr. Schinnar. Mr. King testified that "[t]he rate increase proposed by PECO would create a 'rate shock' that would severely burden residents of the Philadelphia area, weaken the busi-

nesses and the government agencies that serve those residents, and damage many of the industries that represent the employment base of the area." PBUUG St. No. 1 at 3. The employment base of the Philadelphia area would be damaged because industries would be less able to compete with their counterparts throughout the nation and the world who are not experiencing increased electric rates of the magnitude of PECO's proposal according to Mr. King. Id. at 4-5. "To the extent that increases and electric charges increases their costs, [industry's] ability to compete is marginally degraded." Id. at 4. Mr. King further stated that service industries and government would be harmed by PECO's Rate Proposal because significant dollars which would otherwise be spent on consumer goods and services or used to support public service would go to pay the electric bill. Id.

George Grier testified that 20% of PECO's residential customers - 226,000 ratepayer households containing nearly 600,000 people - have incomes at or below 150% of the federal poverty limit. CEPA St. No. 1 at 6, 12. Over two-thirds of those residential customers - some 155,000 households, containing over 400,000 people, live in the City of Philadelphia. Id. at 12. Mr. Grier testified that most of these low-income residentials "already have serious and unavoidable budgetary burdens other than their electricity bills - such as housing, food, and other energy bills." Id. at 4. "To impose PECO's requested rate increase on them," he stated, "would impose severe hardship." Id. at 4-5.

Mr. Grier's conclusions are supported by Dr. Schinnar's study which shows that low-income residentials are less able to decrease their demand for electricity and therefore they will suffer a larger rise in expenditures for electricity than other income groups. City Statement No. 1 at 30-31. Dr. Schinnar therefore concluded that low income residentials will be more severely effected by PECO's Rate Proposal than other income groups.

F. Dr. Schinnar's Findings of Severe Economic Consequences Associated With PECO's Rate Proposal Were Supported By The Testimony Of Dr. Feldman

Dr. Feldman's testimony in these proceedings further supports the findings and the conclusions of Dr. Schinnar. In general terms, Dr. Feldman testified that if PECO's Rate Proposal is granted then "jobs would be lost, city wage tax revenues would decline, disposable income would be reduced, the Philadelphia economy would become less competitive, [and] this would mean a lower growth rate for the Philadelphia economy." Id. at 7.

In discussion of the effect of PECO's proposal on the University of Pennsylvania Dr. Feldman testified that 175-200 current jobs at the University could be lost in order to offset the electric rate hike. Id.

Dr. Feldman also presented testimony with respect to the impact PECO's Rate Proposal on commercial business. He testified that PECO's rate hike would drive-up the cost of renting commercial office space in the region. Id. at 5. Utility costs are approximately 40% of total office space operating costs according to Feldman. Id. Feldman stated that the cost of renting office space in Philadelphia is presently the third highest in the nation. Id. at 5, 8. If PECO's proposed rate hike is granted, firms may be prone to locate in areas outside of PECO's service territory, such as Camden, Cherry Hill, and Wilmington where office space rental is less expensive. Id. at 5. Feldman testified that this would result in a slowdown in growth in the service sector and that PECO would not receive its revenue requirement due to the loss of commercial business growth. Id. at 5-6. Consequently, according to Dr. Feldman, PECO would further increase its electric rates to offset the revenue shortfall, there would then be a further decline in consumer expenditure for goods and services, which would all result in "further decreased output and employment in the local economy." Id. at 6.

Dr. Feldman has thus provided further technical evidence of the harmfulness of PECO's Rate Proposal.

G. Numerous Public Witnesses Testified That PECO's Rate Proposal Would Have A Severe Negative Impact On The Regional Economy

Four public input hearings were held during the course of these proceedings. These hearings allowed the general public an opportunity to express itself with regard to PECO's Rate Proposal. Title 52 Section 3.163(e) of the Pennsylvania Code, 52 Pa. Code §3.163(e) provides that all relevant, material and competent evidence provided at these hearings are to be considered in the PUC's decision-making process. At these hearings, a significant number of very competent people presented very relevant and material testimony regarding how PECO's rate proposal would impact upon them, their institutions, their businesses, their organizations and associations, specially defined groups of persons, and upon the regional economy as a whole.[12]

For example, several representatives of colleges in the area, such as Temple University, Bryn Mawr College, Gwyneed College, Philadelphia College of Pharmacy & Science, Swarthmore College, Thomas Jefferson University and St. Joseph's University, testified that PECO's Rate Proposal would directly lead to significant increases in tuition and decreases in available financial aid for their students. Tr. 14-23. The money taken from the increases in tuition and decreases in financial aid would be used to pay the significant increase if PECO's Rate Proposal is implemented.

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[12]My discussion of public input hearing testimony focuses on the afternoon session of February 4, 1986, held in Philadelphia.

There was also testimony by or on behalf of the poor, many of whom are having difficulty paying present PECO rates for electricity. Tr. 57, 103, 106. This testimony established that the poor cannot afford to pay the proposed increase in rates and still buy food, clothing, pay rent, pay for gas and water or for any of the other necessities of life. Tr. 57, 103, 106.

Testimony also established that manufacturers, businesses, and local governments would also have difficulty coping with PECO's Rate Proposal. Businesses may shut down or leave the area as a result of PECO's Rate Proposal. Tr. 30. The price of public transportation and water services may increase. Tr. 27. There may also be increases in taxes in order to offset the increase in local governments' electric bills. Tr. 27.

In summary, overwhelming evidence of record from the public input hearings establishes strong opposition to PECO's Rate Proposal due to the economic hardship which would follow its implementation. Further and more detailed discussion of public input testimony may be found in Appendix A of this brief.

IV. FINANCIAL ANALYSIS

A. The Goal Of The PUC In Setting Rates Is To Appropriately Balance The Conflicting Interests Of The Utility And The Consumer So That Rates Are Just And Reasonable

The principal goal in utility ratemaking is to set rates which appropriately balance the conflicting interests of the utility and its consumers. The utility's interest is in acheiving significant profits. The consumer's interests are met by affordable rates. Only when there is an appropriate balance struck between these two conflicting interests can rates be considered just and reasonable. Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591, 603, 64 S.Ct. 281, 288, 88 L.Ed. 333, 345 (1944); Pennsylvania Public Utility Commission v. Pennsylvania Gas and Water Co., 492 Pa. 326, 337, 424 A.2d 1213, 1219 (1980), cert. den. 454 U.S. 824, 102 S.Ct. 112, 70 L.Ed. 2d 97 (1981).

It is not required that rates be set in order to allow a utility to achieve a certain level of profits if those rates would otherwise be unjust and unreasonable on balance. The Pennsylvania Supreme Court has gone as far as to state that it is not required that rates ensure a utility's financial viability. In Pennsylvania Electric Company v. Pennsylvania Public Utility Commission, 502 A.2d 130 (Pa. 1985), it stated as follows:

> In cases where the balancing of consumer interests against the interests of investors causes rates to be set at a "just and reasonable" level which is insufficient to ensure the continued financial integrity of the utility, it may simply be said that the utility has encountered one of the risks that imperil any business enterprise, namely the risk of financial failure.

Id. at 134.

Evidence referenced above in regard to the present case establishes that PECO's Rate Proposal would be unjust and unreasonable due to the extreme economic hardship which that rate plan would cause in the Philadelphia Metropolitan Area. An alternative rate plan is therefore required in order to set just and reasonable rates. The City submits that its recommended rate plan[13] appropriately balances the interests of consumers against the interests of the utility. Under the City's recommended rate plan, consumers are not severely and adversely impacted by increased rates and PECO receives its requested revenues albeit on a more extended timetable. The City's recommended rate plan is just and reasonable because it ameliorates the impact of increased rates without adversely affecting PECO's financial viability.[14]

B. The Commission Should Not Allow Merely Proposed Changes To Accounting Rules For Financial Reporting Purposes Dictate Its Treatment Of PECO's Requested Rate Increase To The Detriment Of The Philadelphia Metropolitan Area Economy

The accounting treatment of assets, liabilities, income and expenses for ratemaking purposes is within the sole discretion of the PUC. 66 P.S. §1701; Scranton-Spring Brook Water Service Co. v. PUC, 67 A.2d 735, 165 Pa.

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[13]As previously stated above the City recommends a seventeen (17) year rate plan in lieu of PECO's proposed six (6) year plan.

[14]As stated above, it is not required that a utility's financial integrity be ensured if rates would otherwise be unjust and unreasonable. Electric Company v. Pennsylvania Public Utility Commission, supra. However, the City believes that its recommended rate plan strikes an appropriate balance between utility and ratepayer interests which would allow the utility continued financial viability.

Super. 286 (1949). City St. No. 2 at 36. Therefore, the PUC is not bound by accounting principles developed by private organizations for financial reporting purposes. Id.

PECO has contended in these proceedings that the City's recommended seventeen (17) year rate plan runs afoul of proposed changes to accounting rules for financial reporting purposes and therefore should be rejected. City St. No. 2A at 1-7. The City submits that it would be unjust and unreasonable to phase-in rates over too short a period of time and damage the regional economy based on a mere proposed rule change which even if adopted would not be binding upon the PUC. Id. at 2. Further there is no evidence of record that PECO would fail to attract needed capital under a longer than ten (10) year rate plan.

The exposure draft circulated by the Financial Accounting Standards Board ("FASB") proposes to limit rate plans to ten (10) years in order for a utility to report as income to its shareholders the total allowed revenues in the first year. Id. at 6. If a rate plan exceeds (10) years, a utility must report to shareholders as income only the amount it actually earns in each year. Id. at 6-7. Accounting Statement 71 ("FASB-71") presently has no restrictions on the length of a rate plan for financial reporting purposes. City St. No.2 at 39.

The FASB-71 exposure draft is presently open to public and industry comments. A public meeting on the Draft is scheduled for June 4-6 of this year. TR. 2641. Mr. Palast testified that a final ruling on any changes to FASB-71 may not come until 1987. Tr. 2641. It is therefore, highly unlikely that a final decision with regard to the exposure draft will be reached prior to a Commission Order in this case.

The FASB 71 exposure draft represents the second proposed amendment to generally accepted financial reporting rules. City St. No. 24 at 2.

The first proposed amendment--the American Institute for Certified Public Accountants (AICPA) Issues Paper--did not establish a time period for rate plans but stated that phased-in rates would be discounted according to the length of the rate plan. City St. No. 2 at 40-41, Exh. GP-4. Therefore, as under the present rules, more income than actually earned in any year would be reported to stockholders. Id. However, those amounts discounted under a rate plan would be less than the total Commission allowed revenues. Id. The longer the rate plan, the less the amount the utility is able to report as income in any year. Id. The FASB exposure draft which proposes a different revision to Accounting Statement 71, as previously described, succeeded the AICPA Issues Paper. City St. No. 2A at 2. Based on the following record evidence, it is unlikely that the FASB-71 exposure draft will be the final word on this matter either. Id.

There is strong doubt that the FASB-71 exposure draft will be adopted. The FASB circulated the exposure draft only after a 4-3 vote of its members. Tr. 2636. This extremely close vote hardly represents a strong endorsement of the exposure draft by the FASB. City St. No. 2A at 3. Also, it is anticipated that strong opposition to the exposure draft will come from numerous utilities who presently or will likely in the near future collect rates over a longer than ten (10) year rate plan. Tr. 2636. Specifically, opposition is likely to come from utilities in Ohio, New Mexico, California, Arkansas, Louisana, New York, Maine, as well as others whose rate plans do or will exceed ten (10) years. Tr. 2636, 2639. It would therefore be inappropriate, unjust, and unreasonable to impose economic hardship on the Philadelphia area by phasing-in rates over too-short a period of time based on a mere proposal which evidence suggests will not be adopted. Tr. 2635.

It is alternatively recommended that if the Commission is so inclined, it may state in its Order in this case that it may reconsider an

extended rate plan if and when changes to FASB-71 are adopted. Tr. 2637. The Arkansas Public Service Commission in a recent decison adopted such a stance. City St. No. 2A at 3. In this way the PUC need not make a prediction with regard to the exposure draft which might lead to the Commission's adoption of a rate plan detrimental to the Philadelphia area economy.

The City, however, strongly recommends that the Commission adopt its proposed rate plan even if FASB-71 is adopted because there is no evidence of record that PECO would fail to attract needed capital under a longer than ten (10) year rate plan. City St. No. 2A at 5, 8-9, City St. No. 2 at 56. There is an abundance of evidence however that the Philadelphia area economy would be severely harmed if PECO's full increase is granted and a ten (10) year or less rate plan is implemented.

C. PECO's FINANCIAL CONDITION WILL IMPROVE SIGNIFICANTLY AS A RESULT OF LIMERICK I"S INCLUSION IN RATE BASE

With the inclusion of Limerick I in rate base PECO will experience a significant improvement in its financial condition even under a more extended rate plan such as the one recommended by the City if PECO's proposed rate increase is granted. City St. No. 2 at 44. Once Limerick I is in rate base PECO's cash flow will greatly increase. Id. at 44-45. PECO will stop accruing interest on the capital costs associated with the construction of Limerick I. Id. Rather, PECO will begin receiving a return of its investment in the plant in the form of depreciation expense. City St. No.2 at 45,48. PECO will also be given an opportunity to achieve a specified rate of return to pay investors. Id. Thus, PECO will also receive a return on its investment. Id. PECO will receive deferred tax expense and operation and maintenance expense as well. Id.

Completion of the Limerick I project results in a dramatic reduction in PECO's borrowing needs. Id. Coupled with PECO's increased earnings

from higher rates, PECO's earnings-to-debt ratios will increase sharply. Thus, there will be a marked improvement in PECO's financial indicators such as interest coverages and the percentage of internal cash generation to construction spending. Id. at 46-49. For example, PECO's mortgage interest coverage ratio will rise from 2.3x in 1980 to 4.6x in 1986. Id. at 46-47. The Company's SEC coverages with and without AFUDC will stand in 1986 at 3.2x and 2.9x respectively, as compared with 2.1x and 1.5x in 1980. Id. at 46. Mr. Palast testified that the City's recommended rate plan would not seriously erode these improved financial indicators. City St. No. 2A at 9-10.

PECO witness Joseph Brennan admitted in testimony that there will be a significant drop in the percentage of Construction Work in Progress (CWIP) to book common equity. Tr.52 Specifically CWIP, as a percentage of book common equity, will decrease from 147% to approximately 37% irrespective of the length of time in which rates are recovered. City St. No.2 at 47.

The inclusion of Limerick I in rate base will also relieve investor uncertainity with regard to the rate treatment of the plant. Id. at 45. Thus, investor risk is lessened with the inclusion of Limerick I in rate base and this may lead to an upgrading of PECO's bond rating. Central Maine Power's ("CMP") bond rating was upgraded despite major write-offs of the Seabrook Nuclear Plants and a phase-in of approved rates. City St. No.2 at 58. In addition, CMP's stock has soared, having risen 46.2% in 1985. Id. Kansas Gas & Electric, Pacific Corp, and Dayton Power and Light also experienced an upgrading of their bond ratings despite large write-offs for nuclear plants and implementation of phase-in plans. Id. at 61. Mr. Palast testified that utilities often experience an increase in their bond ratings despite large write-offs and phase-in plans because there is an improvement in the utility's financial outlook with the end of nuclear construction and rate treatment of the plant.

Id. In summary Mr. Palast stated:

> The end of a nuclear plant's construction marks the end of uncertainty, a rise in cash flow and an improvement in the cash quality of earnings. Such improvements are more important to the financial health of a utility than the number of years in a phase-in plan.

Id. at 61-62. Thus, PECO may also experience an upgrading of its bond rating as did the above-mentioned utilities. For all of the foregoing reasons the City submits that PECO's financial viability would not be jeopardized by the City's recommended rate plan.

D. PECO Can Afford To Implement The City's Recommended Rate Plan

PECO witness Joseph Paquette testified that the Company would lose $1.5 billion in cash flow and carrying charges if the City's recommended plan is implemented in lieu of its own rate proposal. City St. No. 2A at 11. Under the City's rate plan cash flow is lost because PECO would not achieve its full $671 million increase until the seventh year. Carrying charges would also be lost because the City has recommended no interest on the deferred revenues. PECO under its own three (3) year phase-in plan, also loses cash flow and potential interest on deferred revenues. However, the Company has appropriately recognized that it must take steps to dampen the impact of its rate request on the regional economy. PECO also realized that it would benefit in the long-term from any steps which will keep customer demand for electricity from decreasing significantly. However, PECO did not go far enough in order to ameliorate the adverse economic impact of its request or to ensure the collection of its full revenue request. Thus, it is necessary to go beyond the steps taken by PECO. It is necessary to implement the City's recommended rate plan which a Wharton School study has established would minimize the adverse impact of increased

electric rates. Rates established under the City's recommended plan would therefore be just and reasonable. PECO's Rate Proposal conversely is not based on an economic impact study and is therefore arbitrary and inadequate. The Wharton study has shown that PECO's Rate Proposal would severely harm the Philadelphia area economy. PECO's Rate Proposal would therefore result in unjust and unreasonable rates.

Under the City's rate plan PECO would receive less money in the early years and more money in the later years. City St. No. 2 at 75; City St. No. 2A at 9. It would therefore be incumbent upon PECO to manage its funds accordingly if the City's rate plan were implemented. Id. at 11-12. PECO has not presented evidence in these proceedings that it would be unable to manage its funds so as to accomodate the City's seventeen (17) year rate plan to the benefit of the regional economy. The City further submits that its recommended rate plan appropriately balances the interests of PECO and its consumers so that rates are just and reasonable.

V. Other Revenue Issues

A. PECO Should Not Be Allowed To Recover Interest On Deferred Revenues As This Would Undue The Benefits Of Phasing-In Rates.

PECO has not requested interest on the revenues deferred under its rate proposal. PECO Exh. No. 3 at 3. PECO's stated reason for not making this request is its attempt to ameliorate the economic impact of its proposed rate increase. Id. The City agrees that interest should not be added to the deferred revenues. It would not serve the regional economy well to postpone rate shock from the phase-in period to the deferred revenue recovery period by allowing interest to be recovered on the deferred revenues.[15] City St. No. 2 at 75. Thus, to allow interest on the deferred balance would negate the benefits of phasing-in rates. Id. The City, therefore, similarly recommends that no interest on the deferred revenues be collected under its recommended phase-in plan. City St. No. 2 at 74-79.

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[15]Under PECO's Rate Proposal if interest were allowed on the deferred revenues, consumers would pay nearly one billion dollars as opposed to $670.7 million during the deferred revenue recovery period. City St. No. 2 at 74-75. Therefore, the additional rates paid annually by consumers during the deferred revenue recovery period would be $349 million as opposed to $223 million. Id. at 75. Rates would thus increase by 43% over current rates by 1988 or the first year of the deferred revenue recovery period. Id. Such a significant increase in rates would prove damaging to the regional economy. Id.

Similarly, the allowance of interest on the deferred balance under the City's recommended rate plan would damage the economy. City St. No. 2A at 11. Interest on the deferred balance would significantly increase the $2 billion deferral over 10 years which consumers would pay under the City's recommended rate plan as presently structured. Id.

B. PECO Should Not Be Allowed To Go Beyond The Deferred Revenue Recovery Period To Collect Deferred Revenues As This Would Penalize Consumers For Their Conservation Efforts.

PECO has proposed that collection of all of its deferred revenues be guaranteed. City St. No. 2 at 66-67. To do this, PECO has requested that it be allowed to go beyond the deferred revenue recovery period if necessary in order to collect rates. PECO St. No. 17 at 7. See also, PECO's Unrecovered Revenue Collection Rider filed in this case. PECO's request for "guaranteed" rates is unprecedented. City St. No. 2 at 72. This request penalizes those customers who would choose to conserve and therefore decrease their demand and electric bills. The City submits that those customers should be allowed the benefit of those savings from its conservation efforts and not have to pay-out those savings to PECO at a later date.

Also, PECO's proposed guarantee of rates runs afoul of Commission policy and practice which allows a utility an opportunity and not a guarantee of collecting its allowed revenues. PUC v. Philadelphia Electric Company, R-822291 (November 23, 1983) mimeo at 20. PECO's proposal is also repugnant to the concept of prospective as opposed to retroactive ratemaking. Green v. PUC, 473 A.2d 209, 217-18 (Pa. Commw. 1984); Pennsylvania Gas & Water Co. v. PUC, 470 A.2d 1066, 79 Pa. Commw. 416 (1984); City St. No. 2 at 68. Under this concept rates are set based on a revenue requirement projection. City St. No. 2 at 68. Utilities are not allowed to "reach-back" and collect additional revenues if the revenues they achieve prove to be insufficient. Id. For the foregoing reasons, the City recommends that PECO be precluded from going beyond a set deferred revenue recovery period in collecting its deferred balance.

C. PECO Should Guarantee Its $207 Million Estimated Fuel Savings In Each Of The Next Two Years

PECO's base rate request in these proceedings actually exceeds $870 million. PECO's Exh. No. 3 at 4, Appendix A. PECO, however, has reduced

this request to reflect estimated fuel savings in the amount of $207 million in each of the next two years (July 1, 1986-June 30, 1988) to be reflected in the Energy Cost Rate (ECR) proceedings. PECO St. No. 22 at 26-27; Peco St. No. 18 at 6-7. See also "Sample of Bill Insert", Sheet 1 of 2 filed by PECO in this case. Therefore, in order that this rate increase not exceed the requested amount of $671 million, PECO's estimated fuel savings should be guaranteed. Under such a guarantee ratepayers would realize the fuel savings irrespective of whether they are actually achieved by PECO.

In addition, PECO guaranteed the fuel savings associated with the Salem plant in its last rate proceeding at PUC Docket No. R-842590. City St. No.2 at 64. Said guarantee came as a result, of the concern regarding the used and usefulness of the Salem Nuclear Generating Unit No. 2. Pa. PUC v. PECO, R-842590 (January 25, 1985), mimeo at 35, 44, 51; PECO St. No. 18D at 14. Therefore, the fuel savings were guaranteed in order to satisfy those who reasonably questioned whether the plant would be used and useful to the benefit of ratepayers and should be included in base rates. Id.

In the present case there are similar concerns surrounding Limerick I. PECO continues to have trouble accessing an adequate supply of cooling water to operate the plant. City St. No. 2 at 66. There are thus concerns regarding whether Limerick I will be used and useful and should be included in base rates. "The burden is on the utility to establish that the property sought to be included in rate base is used and useful in the public service." PUC v. Green, 473 A.2d 209, 214 (Pa. Commw. 1984). It would therefore, be similarly appropriate for PECO to guarantee the estimated fuel savings in this case as it did in the last one in order to show that Limerick I will be used and useful to the benefit of ratepayers. The City thus recommends that the estimated fuel savings be guaranteed to the benefit of ratepayers regardless of

whether they are actually achieved.

D. Ratepayers Should Realize The Savings Associated With Limerick I's Operation At 65% Capacity Irrespective Of Whether It Actually Operates At That Level

In the Limerick II Investigation at PUC Docket No. I-84038 the Commission in its Order stated that PECO's consumers were to realize the fuel savings associated with Limerick II's operation at 65% capacity irrespective of whether it actually operates at that level. Limerick Unit No.2 Nuclear Generating Station Investigation, I-840381 (December 5, 1985), mimeo at 87-89. In that way the PUC was ensuring ratepayers substantial benefits from an otherwise costly, burdensome plant.

PECO in this case has stated that its estimated $207 million fuel savings in each of the next two years (July 1, 1896-June 30, 1988) results from Limerick I's operation at 65% capacity. PECO St. No. 22 at 26-27. The capital costs ($3.8 billion) charged to ratepayers for Limerick I are high. PECO St. No. 18 at Table 1. The benefit to ratepayers of Limerick I are its fuel savings. City St. No. 2 at 78. Therefore, in each year thereafter, ratepayers should continue to benefit from the fuel savings associated with Limerick I's operation at 65% capacity. The City therefore recommends that the fuel savings associated with Limerick I's operation at 65% capacity be passed-on to ratepayers regardless of whether the plant actually achieves that level of operation. City St. No. 2 at 64.

VI. Rate Structure

A. The City Is Deserving Of No Increase To Its Street Lighting Rates As Proposed By PECO.

PECO has proposed no increase in rates for Philadelphia Street Lighting (SLP). PECO St. No. 17 at 9. The City, for the reasons stated below, recommends adoption of this proposal by PECO.

Dr. Ileo has testified that the City's recommendation of a 0% increase for rate SLP is more than reasonable. City St. No. 3 at 3-4. He has stated that a recommendation for decreased rates for SLP would have been appropriate in this case. Id. He cited two primary reasons which belie the reasonableness of the City's recommendation. One is that SLP's rate of return under present rates is 174% of the system average rate of return. PECO St. No. 17 at 9; City St. No. 3 at 4. This established that SLP has been subsidizing other customer classes whose rates of return are below the system average. City St. No. 3 at 4. PECO's proposed distribution of revenue increase moves all customer classes closer to the cost of providing service to them. Id. at 4-5. In other words, all customer classes are moved closer to the system average rate of return.

Another reason why the City's recommendation should be adopted is that if PECO had done an appropriate cost of service study with regard to distribution plant costs and energy costs it would reveal that SLP's rate of return is actually greater than 174%. Id. at 4. The city is therefore, deserving of a rate reduction for SLP according to Dr. Ileo. Id. The City, however, recommends that rates for SLP at least not be raised.

B. The Predominate Minimum System Method Employed By PECO Results In An Improper And Unfair Classification Of Distribution Plant Costs

PECO has classified distribution plant costs as being both customer and demand-related. City St. No. 3 at 30. PECO has utilized the pre-

dominant minimum system ("PMS") method in classifying distribution plant costs. City St. No. 3 at 30-31. Under the PMS method that portion of distribution plant costs classified as customer costs are determined by pricing each of the "predominant" or prevalent sized facilities within each of the distribution plant accounts.[16] Id. The average installed costs of these facilities are then classified as customer-related distribution plant costs. Id. at 31. All other distribution plant costs are classified as demand-related costs.

PECO witness William Sundermeir alleged that the PMS method is consistent with the method described in the NARUC manual on cost allocations. PECO St. No. 24A at 6-7. The NARUC manual in question, however, provides that the customer-related distribution plant costs are only those costs associated with distribution plant facilities necessary to serve a customer as if he only had a 25-watt light bulb. Id. at 32; Electric Utility Cost Allocation Manual, NARUC, 1973, Chapter VI, page 56. Thus, customer-related costs are those costs associated with the minimum-sized distribution plant facilities necessary to bring electricity into the home of someone with only a small electrical device. The customer cost component derived through use of the PMS method however, reflects the costs associated with the predominant distribution plant facilities--the facilities which are necessary to operate much larger electrical appliances. Id. at 31-32. This classification of costs is detrimental to SLP. SLP is comprised of thousands of customers because the Company counts as one (1)

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[16]The seven distribution plant accounts and their associated expense accounts may be found at page 30 of Dr. Ileo's Rebuttal Testimony in this case, City St. No. 3.

customer each individual street lamp or small cluster of street lamps as found in a shopping mall for example. Id. at 32. The costs associated with SLP's demand on the system relative to its customer costs are low. Id. Therefore, an overstatement of customer costs work's to SLP's disadvantage. By overstating the customer costs associated with distribution plant costs, PECO's class cost of service study understates SLP's rate of return which we have previously stated herein is 174% of the system average return. Id. at 32-33. Thus, if an appropriate method such as the minimum system method were utilized, SLP's rate of return would have been found to be greater than 174% of the system average return. This establishes that the rate for SLP should actually be decreased in this case. The City recommends that the Commission order PECO to employ the minimum system method in the next rate case.

C. Time-Of-Use Considerations Should Be Reflected In PECO's Allocation Of Energy-Related Costs So That These Costs Are Not Overstated For Off-Peak Customers

In this case, PECO allocated energy-related costs to customers on a simple KWH basis based on the volume of electricity that customers consume. City St. No.3 at 12. No time-of-use considerations were reflected in PECO's allocation of energy-related costs. Id. By not utilizing time-of-use considerations, PECO has not allocated energy costs to customers based on the cost of serving those customers. In other words, PECO's class cost of service study does not reflect the actual costs incurred by the Company in supplying energy to a particular customer Id. at 11-12.

The energy costs associated with a peak and off-peak customer are different. Id. It costs more to supply energy to a peak customer. Id. This is because the cost of energy from a peaking unit necessary to serve the peak demand is greater than the cost of energy from a baseload plant necessary to

serve off peak demand. Tr. 42227; City St. No. 3 at 18. Energy costs should be paid by customers in accordance with the costs which that customer imposes on the system. Rates could then be said to be cost-based. Therefore, under an appropriate class-cost of service study, the energy costs allocated to SLP--an off-peak customer--would be less than those allocated to a peak customer. City St. No. 3 at 12. SLP's present rate of return as provided under PECO's cost of service study is therefore, understated. The City recommends that the Commission order PECO to present a class cost of service study which reflects the allocation of energy costs on a time-of-use basis in the next rate proceeding.

D. Production and Transmission Plant Costs Should Be Allocated On A Coincident Peak Demand Basis Which Is Consistent With The Way In Which These Costs Are Incurred

PECO has classified production and transmission plant costs as related to each customer class contribution to peak demand. City No. 3 at 9. Dr. Ileo has accepted PECO's classification of production and transmission plant because it reflects the way in which these costs are incurred. City St. No. 1 at 12-13. The costs associated with this plant are related to the design and size of the system. Id. at 16-18. This plant is designed and sized to meet the combined (coincident) peak demand of all customer classes on the system. Id. It is thereby wholly appropriate to classify plant in this manner. Id.

Some parties to these proceedings have proposed to classify production and transmission plant on an energy-related basis so as to shift more of the burdensome costs of Limerick I onto off-peak customers such as SLP who impose the least costs on the utility and creates the greatest benefit for other customers. Id. at 15-16. Evidence of record as cited above provides that all customer classes would be harmed by PECO's Rate Proposal. Specifically, evidence of rate shock, imprudency, excess capacity, non-used and useful plant,

etc. has been provided in this case. As a result, Parties to these proceedings have provided compelling evidence that PECO's proposed revenue requirement should be modified so that PECO does not receive rates of the magnitude of its request.

However, the City believes that it is unreasonable for parties to offer various rate structure schemes which are not cost-based in their attempts to avoid the burdensome costs of the Limerick plant to the detriment of other customer classes. Tr. 4227-28. It is inappropriate to cost Limerick I differently than PECO's other generating units. City St. No. 3 at 19. The City therefore, submits that the classification of production and transmission plant should reflect cost-based methods as opposed to cost-benefit schemes.[17]

The City further submits that on an equitable basis it would be unfair to shift costs onto an off-peak customer such as SLP. This is because an off-peak customer imposes the least costs on the system and creates the greatest benefit for other customers. City St. No.3 at 15-16. One reason why off-peak customers impose the least cost on the system[18] is because increases in their sales can be met without adding capacity. Id. at 29. This in turn works to the benefit of other customers because the system load factor improves with increased off peak sales. Id. This results in lower system unit costs for all

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[17]Some parties to these proceedings have testified that since the benefit of having Limerick I in commercial operation is its fuel savings, that its costs should then be classified as energy-related. City St. No. 3 at 14.

[18]The low fuel costs associated with off-peak customer usage as compared to peak customer usage as previously stated above, is another reason why off-peak customers impose the least cost on the system.

benefit of other customers because the system load factor improves with increased off peak sales. Id. This results in lower system unit costs for all customers. Id. SLP and other off-peak customers should be rewarded and not penalized for this benefit which they provide. It should also be noted that to shift costs onto SLP and other off-peak customers may lead to depressed sales which would serve to worsen the system load factor to the detriment of all customers. Id. PECO witness Sundermeir also testified that such increases would "tend to discourage off-peak use." PECO St. No. 24A at 3.

For all the foregoing reasons, the City recommends that PECO's classification of distribution plant costs as coincident peak demand-related be adopted. The City further recommends adoption of PECO's allocation of no increase in rates to Philadelphia Street Lighting.

VII. DISCOVERY

A. PECO Was Able To Obtain Adequate And Sufficient Materials And Information Regarding Dr. Schinnar's Computer Model And Its Claims To The Contrary Constitutes A Sham And A Ruse

PECO has alleged during the course of these proceedings that it was denied adequate and sufficient information regarding the computer model ("STARLOC") upon which Dr. Schinnar has based his testimonies in these proceedings. The City submits that such allegations are untrue and constitutes a calculated tactic on the part of PECO, to avoid addressing the substance of the Wharton study. It is clear from evidence of record that PECO was ill-equipped to mount a substantive attack of Dr. Schinnar's STARLOC model. Not one of PECO's five experts sent to the Wharton School to analyze STARLOC could read a computer code. Tr. 4619.

With regard to the issue of economic impact PECO has relied exclusively in this case on a study conducted by sociologist Frank Clemente. No other PECO witness in these proceedings has presented an economic impact study. Dr. Clemente admitted that he was not an expert in the fields of economics, econometrics, statistics or computer modelling - all of which are prerequisites to an understanding of the STARLOC model. Tr. 4406. Dr. Clemente also admitted that he did not understand the equations in the Technical Report (PECO Exh. 22) which describe the STARLOC model. Tr. 4415. He further admitted that he did not visit the Wharton School on any of the four days which Dr. Schinnar set aside for discovery conferences with PECO's experts. Tr. 4437. It is clear that PECO's principal witness on economic impact did not understand nor did he care to understand the computer model which he stated he was hired to rebut. PECO St. No. 36 at 3.

PECO had access to adequate and sufficient discovery materials to analyze and test the validity and accuracy of the STARLOC model if it were so

inclined. As Dr. Schinnar stated in testimony, PECO has been provided all available data, documents, information and materials regarding the STARLOC model and his testimonies. Tr. 4664. PECO, however, tactically chose not to make the best use of this available information. City St. No. 1A at 14.

In conclusion, PECO's false claims of inadequate and insufficient discovery does not change the truth-of-the matter which is that overwhelming evidence of record establishes that PECO's Rate Proposal would severely harm the Philadelphia Metropolitan Area economy. The PUC must therefore reject PECO's Rate Proposal in favor of a rate plan which tracks the rate of inflation and would result in just and reasonable rates as recommended by the City.

VIII. CONCLUSION

For the reasons set forth above the City respectfully requests adoption of the following seven (7) recommendations:

1) That any increase in rates granted PECO should be comensurate with the rate of inflation which is approximately 4%. The 4% annual increase over seven (7) years (June 1986-June 1993) implies an increase in the first year of $95.8 million if PECO's entire requested increase is granted.

2) That deferred revenues under proposed rates, if granted, be collected at an annual rate of 3.4% or $200 million over a ten (10) year period (June 1993-June 2003).

3) That PECO not be allowed to collect interest on the deferred revenues.

4) That PECO not be allowed to go beyond the ten (10) year period in collecting its deferred revenues.

5) That estimated fuel savings in the amount of $207 million in each of the first two (2) years (July 1, 1986-June30, 1988) be guaranteed to the benefit of ratepayers.

6) That after the first two (2) years (July 1, 1986-June 30,1988) ratepayers realize the fuel saving associated with Limerick I's operation at 65% capacity.

7) That Philadelphia Street Lighting receive no increase in rates.

Respectfully submitted,

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DATED: April 7, 1986

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APPENDIX A

Testimony from the public input hearing held on the afternoon of February 4, 1986, in Philadelphia is summarized below.

(1) Educational Institutions Would Be Forced to Raise Tuition and Cut-Back On Financial Aid If PECO's Rate Proposal Is Granted

Representatives from numerous colleges and universities testified at the public imput hearings. Institutions represented included Temple, University, Bryn Mawr College, Gwyneed College, Philadelphia College of Pharmacy & Science, Swarthmore College, Thomas Jefferson University and St. Joseph's University. These institutions have served an important role in the Philadelphia Metropolitan Area in the areas of education and community service. Testimony was presented by each of the representatives of these institutions, that PECO's Rate Proposal would adversely attract, retain and educate students and serve the public. Temple University President, Peter J. Liacouras testified that if PECO's Rate Proposal is granted, tuition would be raised by $104 or 3.3% by 1989, just to cover the increased cost in electricity to the University. Tr. 14. Mr. Liacouras also testified that this would represent a significant increase to Temple's students - eight out of ten of whom work their way through college. Tr. 16. In addition, PECO Rate Proposal would hurt Temple University's ability to provide students needs with financial aid as money which would otherwise be spent in this area would be diverted to pay the increased electricity bill. Tr. 16.

Mr. David Christianson representing the Philadelphia College of Pharmacy and Science similarly testified that tuition at his institution by 1989 would be raised by $110 to offset the increased electricity bill. Tr. 20. Mr. Christianson further testified that PECO's Rate Proposal coupled with decreases in financial aid and student loan programs would result in many students being forced to leave school as costs became prohibitive. Tr. 21.

Similarly, Ms. Phyllis Lach representing Bryn Mawr College testified that her institution's electric bill would increase by $207,000 if PECO's Rate Proposal is granted. Tr. 18. This additional cost she stated would be passed on to students in the form of a burdensome tuition increase. Tr. 18. Sister Janet Baker representing Gwyneed College also testified that increased electricity costs would be passed on to students, many of whom depend on the college for financial aid. Tr. 18-19. Donald B. Kelly, a representative of Swarthmore College testified that if PECO is granted its Rate Proposal"... our students will be paying the same costs for electricity as a family of four in an average house of seven rooms." Tr. 21-22.

According to Thomas E. McDuffy, the Vice President for Administrative Services at St. Joseph's University, his institution's electric bill would increase by $175,000 or roughly the tuition and fees of 35 students. Tr. 25. He testified that this money could better be spent by the University on things such as laboratories, libraries and scholarships. Tr. 25.

Thomas Jefferson University is comprised of a hospital as well as an educational institution. Tr. 22. Testifying on behalf of the University, Gene E. Prouty stated that "[i]n order to offset the major increases caused by a 30 percent increase in PECO's rates, we would have to adjust our long-range budgeting in discretionary areas by raising tuition, limiting financial aid, and passing on some costs to the hospital patients." Tr. 23. Mr. Prouty further testified that he may have to lay-off employees in order to "cope" with PECO's proposed rate increase.

Testimony of record as synopsized above show that these important institutions would be severely impacted by PECO's Rate Proposal and that they stand in opposition to it.

(2) The Poor Could Not Afford PECO's Rate Proposal Without Foregoing Other Necessities of Life

Almost fifty percent of all Philadelphians live at or close to the poverty line. Tr. 27. One-half of all senior citizens have incomes at or near the poverty line. Tr. 103. PECO has proposed to raise the rates of residential consumers by 29.6% or from $58.35 to $75.86 per month for the typical customer. PECO Press Release dated September 26, 1985, at p.2. Testimony provided by or on behalf of the poor in the public input hearing was clear-the poor cannot afford to pay the proposed increase in rates and still buy food, clothing, pay rent, pay for gas and water or pay for any of the other necessities of life.

A case in point was provided through the testimony of Ms. Mildred Weinstein, Vice President of Action Alliance of Senior Citizens of Greater Philadelphia. She testified as follows:

> Last year, almost 21,000 Philadelphians had their electric shut off by PECO. We're sure that there are as many more untold stories of people doing without basic necessities, like food and medicine, in order to pay their utility bills.
>
> The figures of the number of people living in poverty in our city are terrible. One-half of all the senior citizens in our city have incomes at or near the poverty line.
>
> In total, nearly 600,000 persons live below 150 percent of the poverty line.
>
> These people now have an average of just $52 a month left out of their income after paying for housing, utilitites and food. That's just $52 for all their doctor bills, prescription bills, other medical expenses, clothing, and all other bills.
>
> PE's new increase will wipe out most, if not all, of that $52, forcing them to go without medical care, clothing and other necessities of life.

Tr. 103. A number of poor people testified that they were in arrears under PECO's present rates. They stated that they could not afford to continue to

make payment on the arrears as well as payment on an electricity bill increased by almost 30%. Ms. Sarah Juhas testified thusly:

> MS. JUHAS: I live with my husband and five children. My husband is unemployed and presently my family's income is $514 a month.
>
> I came today because I want the Commission to know about my circumstances, which are like those of many other low-income families.
>
> I cannot afford a 30 percent increase in my electric bill. Right now I have a payment agreement with PECO to pay off approximately $212 which I owe them. If my bills go up by 30 percent, I will not be able to keep that agreement, which I have kept until now.
>
> In short, this increase will cause me to be shut off. It is that simple.

Tr. 57. Senior citizens and handicapped persons living on fixed incomes would be forced to stretch their meager dollars beyond the limits and face reduced services which they sorely need if PECO's rate increase is granted. Reverend Dwight Campbell of the Mt. Olivet Tabernacle Baptist Church testified that his Church operates a housing complex for 212 elderly and physically disabled people all of whom are on fixed incomes. Tr. 106. He stated that if PECO's Rate Proposed is granted he would be forced to increase the rent charged these people and cut the size of his staff. Tr. 106.

In short PECO's Rate Proposal if approved would diminish the already low quality of life which the poor suffer.

(3) PECO's Rate Proposal Would Adversely Impact Upon The Financial Viability of Manufacturers, Commercial Businesses, And Government

Public input testimony was also provided with respect to the economic impact of PECO's Rate Proposal on area manufacturers, commercial businesses and government. These entities within the regional economy would be adversely affected by PECO's Rate Proposal according to testimony provided.

City Councilman David Cohen for example testified that "[o]ur businesses, many of which are already operating on low-operating on low-profit margins and are threatening to shut down or to leave the area, cannot sustain this rate increase". Tr. 30. Councilman Cohen specifically discussed the anticipated plight of the Crown Cork and Seal Company, Inc. a Philadelphia manufacturer of various kinds of beverage containers. He testified that:

> Already firms such as Crown Cork and Seal, which has 24 plants throughout the country, has said that the major problem they have with their operations here in Philadelphia is energy costs and that a 28 percent rate increase would force them to close their Philadelphia plant, and you know what that means in terms of unemployment hardship.

Tr. 30.

Councilman Cohen further testified that those firms which do not leave Philadelphia will avoid PECO's high electricity rates by producing their own electricity through co-generation. Tr. 30. He cited Scott Paper Company, the University of Pennsylvania and Amtrak as examples of institutions who are planning to produce their own electricity. Tr. 30. However, with the loss of these customers, the "inevitable result" will be a loss of demand for PECO electricity, and those remaining customers of PECO will bear an even greater proportion of PECO's high rates. Tr. 30.

PECO's Rate Proposal will mean that a greater proportion of customer income will be spent on electric bills. This will reduce customer purchasing power according to the testimony of State Representative Babette Josephs. Tr. 26. In order to offset the increase in electric rates, SEPTA may have to increase fares according to State Representative Josephs. Tr. 27. Local government will also have to offset the significant increase in its electric bill. This according to State Representative Josephs will mean an increase in taxes and an increase in water bills. Tr. 27.

In summary, evidence of record from the public input hearings establishes strong opposition to PECO's Rate Proposal due to the economic hardship which would follow its approval.

APPENDIX B

TABLE I

INCOME SUMMARY
($000)

	Pro Forma Proposed Rates $	Recommended Adjustments $	Adjusted Proposed Rates $	Revenue Adjustment $	Total Allowable Revenues $
erating Revenues					
luctions:					
O&M Expenses					
Depreciation					
Taxes:					
State					
Federal					
Other					
tal Deductions					
Income Available					
r Return					
e Base					
ommended Rate of Return					

Not applicable to City recommendations. See Table II.

TABLE II
SUMMARY OF ADJUSTMENTS
($000)

commended justment	Exhibit Reference	Rate Base Effect $	Revenue Effect $	Expense Effect $	Depreciation Effect $	Effect Upon Taxes-Other $	State Tax Effect $	Federal Tax Effect $
City Statement #2 recommends five adjustments to the phase-in plan for Limerick 1 proposed by PECO:								
1. Phase-in Limerick costs over 7 years.								
2. Recover deferred revenues over years 8 through 17.								
3. Permit no return on deferred revenue. (PECO did not seek a return.)								
4. Reject the proposed, "Unrecovered Revenue Collection Rider."								
5. Require PECO to guarantee $207 million per year in annual fuel savings over the first two years of the rate plan.								
None of these adjustments affects test year revenue or income. However, lengthening the phase-in from three years to seven affects the proportion of deferred revenues to current revenues and deferred taxes to current taxes and revenue taxes. See Table II, Summary of Adjustments.								
Lengthen phase-in from 3 years to 7.	Calc. from PECO Ex.3, Appendix A		Current Revenue (127,800)					
			Deferred Revenue 127,800					
	Calc. from Ex.TPH-2,A-4					Gross Receipts Tax (2,556)		
	Calc. from TPH, Table 1					Current Tax	State: (4,816)	Fed: (58,788)
						~~DeferredTax~~	~~State: 4,816~~	~~Fed: 58,788~~
tal Adjustments								
mpany Rate Base	Total Adjustments		-0-			-0-	-0-	-0-*
commended Rate Base								

APPENDIX C

SCHEDULE OF CITY EXHIBITS

EXHIBIT NO.	DATE IDENTIFIED ON RECORD
CITY EXHIBIT NO. 1	DECEMBER 13, 1985
CITY EXHIBIT NO. 2	FEBRUARY 13, 1986
CITY EXHIBIT NO. 1-1	MARCH 12, 1986
CITY EXHIBIT NO.1A-1	MARCH 12, 1986

STATEMENT NO.	DATE IDENTIFIED ON RECORD
CITY STATEMENT NO.1	FEBRUARY 13, 1986
CITY STATEMENT NO.2	FEBRUARY 6, 1986
CITY STATEMENT NO.3	MARCH 10, 1986
CITY STATEMENT NO.1A	MARCH 12, 1986
CITY STATEMENT NO.2A	MARCH 12, 1986