Trial Staff DPD No. 1
Witness: D.P. Dougherty
Date: January 14, 1986

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Phila
R-850152
RQS

PENNSYLVANIA PUBLIC UTILITY COMMISSION

v.

PHILADELPHIA ELECTRIC COMPANY
DOCKET NO. R-850152

Direct Testimony

of

Dennis P. Dougherty

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

Testimony of Dennis P. Dougherty
on Direct Examination
Before The Pennsylvania Public Utility Commission
in Docket No. M-850010

Q. Please state your name and business address.

A. My name is Dennis P. Dougherty. My business address is P.O. Box 3265, Harrisburg, PA, 17120.

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

A. I am employed by the Pennsylvania Public Utility Commission as an Audit Supervisor.

Q. What are your duties and responsibilities as an Audit Supervisor with the Public Utility Commission?

A. As an Audit Supervisor, I am responsible for the audits of selected utilities filing rate increase requests with the Commission. I am responsible for the supervision of work conducted applicable to special projects and investigations relating to the electric adjustment clause.

Q. Describe your educational background and work experience.

A. The attached Appendix A describes my educational background and work experience.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to present a reasonable approximation of the costs associated with Limerick Unit 1 and Common not meeting an in-service date of April 1981.

Q. Does the methodology utilized for this quantification require knowledge specific to construction of nuclear power plants?

A. Not at all. The method we selected to quantify the costs of the construction delays required no prior experience or knowledge with regard to the construction of a nuclear power plant. This is due to two reasons. First, the Commission at I-8010034 had already determined that the Company did not act prudently when it delayed construction in 1976 and 1978 and that without these delays, Limerick Unit 1 would have been completed in April 1981. Second, our quantification methodology assumed that all labor hours and all quantities of materials were reasonable and essential to the construction of the plant. Therefore, our quantification of the delays did not require us to make any judgments regarding the reasons and responsibilities for the delays nor were any judgments necessary regarding the quantities of materials and labor used in the plant's construction.

What was required of us was to familiarize ourselves with and gain an understanding of the system utilized to record the expenditures applicable to construction of the Limerick plant. We gained this understanding by holding numerous interviews with those employees who worked with the Limerick cost ledgers on a daily basis, by reading applicable policy and procedures documents and whenever the need arose, by asking questions concerning the cost ledgers and related policies and procedures. This work was no different, in fact, because the scope did not include the verification of the amounts recorded in the various ledgers, somewhat less comprehensive than prior work we all performed as Commission auditors. Since the Commission auditors working on this project had combined experience of approximately 25 years, I believe that we were extremely qualified to reasonably approximate the costs associated with not meeting the April 1981 in-service date.

Q. What was your basic goal when quantifying the costs associated with not meeting the April 1981 in-service date?

A. Our goal was to replicate as closely as possible the as built cost of Limerick Unit 1 and the common facilities assuming an in-service date of April 1981. It is important to note that our quantification methodology made no attempt to isolate and assign costs to such things as new or additional regulatory requirements or the use of faulty materials or labor. Because we assumed that all quantities of materials and labor utilized in the actual construction were necessary and reasonable, the cost of such items as faulty material or labor, if any, is reflected in our quantification methodology only to the extent that prices for such material or labor would have been lower had the plant's in-service date been April 1981.

Q. Have you any other comments with respect to your analysis?

A. Three other items are also important to note at this time. First, we are not qualified to say one way or another whether or not the plant could have reasonably been expected to have been in service by April 1981. As stated previously, the Commission's Order at I-8010034 and its attendant April 1981 in-service date was the foundation for our quantification of the delayed construction. Based on this order, we believed it was our duty to present to the Commission a reasonable approximation of the costs associated with not meeting the April 1981 in-service date. Second, the April 1981 date was utilized for both the completed construction date and the in-service date. While the I-8010034 Order specifically mentions an in-service date of April 1981, the Order

is silent as to the date of completed construction. We recognized that it would be very subjective to determine a completed construction date based on the I-8010034 order. Further recognized that AFUDC would be the largest component of any quantification amount and that the AFUDC accrual ceases with the in-service date, we decided it was appropriate to use the April 1981 date for both the completed construction and in-service dates.

Third, and most important, is the fact that we utilized all actual data when we determined the costs associated with not meeting the April 1981 in-service date. The basis for our costs quantification was the records maintained by the Company and its contractor to record the actual costs of labor and materials used in the construction of Limerick Unit 1 and the common facilities. At the time of performing our work the most currently available data included project to date expenditures made through October 30, 1984. These expenditures excluding AFUDC, overheads and taxes totaled approximately $2.155 billion or 91.4% of the $2.358 billion Limerick Unit 1 and common direct costs contained in the instant proceeding.

Quantification Methodology - General

Q. Please, now continue with the general explanation of how you determined the direct costs associated with not meeting the April 1981 in-service date?

A. The quantification process began with the comparison of the project to date expenditures for labor and materials as of the end of April 1981 and October 1984. These amounts were obtained from the Limerick project's books maintained by Bechtel at the job site. Labor costs were taken from the Labor Ledger LD-160 while material costs were derived from

the Material and Subcontract Cost and Commitment Ledger (330-R). Once the total labor and material costs as of April 1981 and October 1984 were obtained, the April 1981 balance was subtracted from the October 1984 balance to arrive at the amount of the labor and material expenditures made after April 1981. These post-April 1981 amounts were then adjusted or restated to approximate what they would have been had such costs been incurred up through April 1981. Labor costs were adjusted based on actual changes experienced in the per unit cost of labor while material costs were adjusted based on changes in appropriate producer price indices. Staff Ex. DPD-1 reflects a sample calculation for the quantification of labor and material costs associated with not meeting the 1981 in-service date. This method of cost quantification was used for all Bechtel items recorded in the LD-160 and 330-R ledgers, i.e., manual and non-manual labor, materials, subcontracts and San Francisco Home Office. PECO expenditures applicable to the Limerick project were obtained from the Company's Engineering and Research report (E&R). It should be noted that all ledgers and reports used as the foundation for our cost quantification analysis were also used by the Company as the source for its Limerick Unit 1 and common costs as claimed in the instant proceeding (Staff Ex. DPD-2).

Once the PECO project to date expenditures as of April 1981 and October 1984 were obtained, the differences between these balances were determined. As in the case of the post-April 1981 Bechtel items, the post-April 1981 PECO expenditures were then adjusted to approximate what such amounts would have been had they been incurred up through April 1981. This adjustment was based on ratios reflecting the costs associated with the delays as developed during the Bechtel portion of our

analysis. For example, the total post-April 1981 PECO non-manual labor expenditures were adjusted by the ratio of Bechtel's non-manual labor costs associated with the construction delays to Bechtel's total post-April 1981 non-manual labor expenditures. Staff Ex. DPD-3 presents a sample calculation of the costs associated with the delayed construction for PECO non-manual engineering expenditures.

Q. How did your analysis incorporate the indirect costs of AFUDC, overheads and taxes?

A. Quantification of the costs associated with overheads and taxes was not performed. This was due to the relatively small dollar amount of these two items. The project to date costs at October 1984 for these items, represented only 1.1% of the total project's costs ($35.8 million vs. $3.170 billion).

Q. How did you quantify the AFUDC costs associated with not meeting the April 1981 in-service date?

A. The quantification of the AFUDC costs can be broken down into three steps. First, we recognized that in order to meet an in-service date of April 1981, the Company would have had to incur more direct costs than those costs actually experienced as of that date. To give the Company credit for these additional costs, our direct costs associated with not meeting the 1981 in-service date were subtracted from the actual direct costs incurred from April 1981 through October 1984. We viewed this remainder as being representative of those additional costs necessary to complete Limerick Unit 1 and common plant as of April 1981. Our second step consisted of distributing these additional costs to points in time and then

calculating an appropriate amount of AFUDC. For distributing the costs, we assumed that they would have been spent over the same number of months as actually occurred. That is, the additional direct costs determined in step 1 were spread evenly over the 42 month period of November 1977 through April 1981 (end of April 1981 through end of October 1984 = 42 months). After the distribution of the post-April 1981 reasonable direct costs, it was simply a matter of multiplying these amounts by the actual AFUDC rates in effect during the 42 months ending April 1981. The results of this extension approximates the additional amount of AFUDC that would have been accrued had Limerick Unit 1 and common been in service in April 1981. Our third and final step in calculating the amount of AFUDC associated with the construction delays consisted of combining the additional AFUDC determined in step 2 with the amount of AFUDC actually recorded up through April 1981. This combined amount represents the total amount of AFUDC that would have been accrued had the in-service date been April 1981. This total amount of AFUDC was then subtracted from the amount of AFUDC claimed in the instant proceeding to arrive at the amount of AFUDC associated with not meeting the April 1981 in-service date. A detailed example of our AFUDC calculation is contained in the Quantification Methodology-Specific Section. Staff Ex. DPD-4 summarizes the results of our quantifying the direct costs and the AFUDC associated with not meeting the April 1981 in-service date.

Quantification Methodology-Specific

Q. Please explain in detail your analysis?

A. Quantification of the costs associated with not meeting the April 1981 in-service date was broken down into the following categories:

I. Bechtel Costs

1) Manual Labor

a) Direct Charges

b) TO-Suspense

1) Accts. 1-8

2) Acct. 9

c) General Construction and Preventative Maintenance

2) Non Manual Labor

a) Unitized Charges

b) Non Unitized Charges

3) Materials and Sub-contracts

a) Direct Charges

b) TO-Suspense

1) Accts. 10-80

2) Acct. 90

4) Home Office

II. PECO Direct Costs

III. PECO AFUDC

Q. Please explain the method used to quantify Bechtel's Manual Labor charges.

A. The first phase of this section consisted of accumulating the project-to-date labor hours and costs as of the end of April 1981 and October 1984. Labor hours and costs were accumulated from the LD-160 ledger for the following major accounts:

XX1 - Concrete

XX2 - Civil and Architectural Work

XX3 - Reactor Pressure Vessel

XX4 - Mechanical Equipment

XX5 - Piping

XX6 - Instrumentation

XX7 - Electrical Equipment

XX8 - Electrical Bulk Materials

XX9 - Distributables

These accounts were further broken down into the following basic categories:

1) Direct Charges

2) TO Suspense Charges

3) General Construction and Preventative Maintenance Charges

Q. Please continue with a discussion of how you accumulated the project to date manual labor direct charges and associated hours as of April 1981 and October 1984.

A. First of all, direct charges are those items specifically identified in the LD-160 ledger as being related to the construction of either Units 1, 2 or the common facilities. These charges are recorded in LD-160 by Unit location and by account code. For example, the labor hours and dollars applicable to concrete work performed in Unit 1's containment area would be recorded in the ledger under 1A1, concrete work performed in Unit 2's containment area would be recorded under 2A1, and concrete work performed in Common Facilities radwaste area would be recorded under

9C1 (See Ex. DPD-5). The accumulation process merely consisted then of identifying and scheduling all direct manual labor hours and costs by location and account code. Exhibit DPD-6 reflects the accumulation of all LD-160 concrete labor hours and costs directly charged to Unit 1 as of the end of April 1981 and October 1984. The manual labor costs directly charged to Units 1, 2 and Common as of April 1981 and October 1984 were as follows:

	October 30, 1984	April 29, 1981
Unit 1	$232,250,910	$ 81,087,904
Unit 2	42,955,809	23,407,541
Common	98,450,718	42,649,544
TOTAL	$373,657,437	$147,144,989

The $373,657,437 represents 57.9% of the total Bechtel manual labor charges applicable to Units 1, 2 and Common as of October 30, 1984.

Q. How did you accumulate the Unit 1, Unit 2 and Common TO Suspense manual labor hours and dollars?

A. There were two categories of TO Suspense items, those identified or already assigned in the LD-160 as being applicable to either Unit 1, 2 or Common and those not assigned to a particular facility. The Company procedure for unitizing the TO Suspense items not assigned to a particular facility in the LD-160 was as follows:

The TO Suspense dollars for each major account XX1 through XX8, unitized by cost code in the LD-160, were added to the direct manual dollars for that account. Once the unitized TO items were added to the direct manual hours, the non-unitized TO items were allocated to the various facilities based on the ratio of each facility's unitized costs to the total unitized costs. Because of the tremendous number of ledger pages and individual charges to the TO accounts, we followed the Company's procedure for the

two accounts which contained the bulk of the total TO charges. These accounts TO, 5 and 8, represented 74.3% of the total charges to TO accounts 1 through8 as of October 1984. For TO accounts 1, 2, 3, 4 and 6, we distributed the total (unitized and non-unitized) amounts recorded in the ledger based on the ratio of each facility's direct manual labor charges to the total direct manual labor charges. Staff Ex. DPD-7 illustrates both methods of unitizing TO charges recorded in accounts 1 through 8.

The remaining TO account applicable to manual labor, TO-9 Distributables differs from TO's 1 through 8 insofar as there are no direct charges in this account. Because of this, TO-9 costs were unitized based on the ratio of each facility's unitized distributable charges plus the total manual labor charges. The Company also used this ratio as the basis for its allocation of the TO-9 distributable charges. An example of the allocation methods used for the TO-9 charges is reflected on DPD-8.

Q. Please explain how you accumulated and allocated the General Construction and Preventative Maintenance Charges as of the end of April 1981 and October 1984.

A. General Construction and Preventative Maintenance charges are designated in the LD-160 ledger by the cost code prefix of "GC" or "GP". As indicated by the Company's unitization procedures (Exh. DPD-9), these costs are all allocated to Unit 1 and Common. To accumulate these charges, it was simply a matter of scheduling the applicable summary totals from the LD-160. We then unitized these costs based on direct labor hours. These GC and GP costs represented 4.4% of the total manual labor costs as of October 1984.

Q. Please explain how you accumulated and allocated the non-manual labor costs as of October 1984 and April 1981.

A. Non-manual labor is generally designated in the LD-160 ledger by the cost code prefix N. Other prefixes used to designate non-manual labor are MO, M2, X1N and X3. Accumulation of these costs were performed by scheduling the charges in the LD-160 ledger recorded to these cost codes. These charges were accumulated by Unit 1/Common total, Unit 2 total and an unallocated total. Unit 1/Common charges were designated by cost codes ending with .1. Unit 2 charges were identified by codes ending with .2. The remaining charges were considered unallocated.

Q. How did you unitize the unallocated non-manual labor charges?

A. Unallocated non-manual labor charges were unitized to Unit 1/Common and Unit 2 based on the ratio of each of Unit 1/Common and Unit 2's portion of the total manual labor charges.

Q. How did you then allocate the total Unit 1/Common charges to each of these facilities?

A. This allocation was based on Unit 1 and Common's ratio of manual labor manhours to the combined total manhours applicable to Unit 1/Common.

Q. Please summarize how you accumulated and unitized the April 1981 and October 1984 Bechtel labor costs.

A. All Bechtel labor costs were obtained from the LD-160 ledger. The LD-160 recorded these costs as being either directly applicable to Units 1, 2 or the Common plant or else costs were placed in "suspense" to be unitized at a later time. In unitizing these "suspended" costs, we attempted to track the Company's method as closely as possible. However, due to the immense volume of data to be scheduled and analyzed, we were unable to exactly follow the Company's unitization procedures in all instances. In these instances, however, we used procedures which approximated those employed by the Company. Staff Ex. DPD-10 compares the percentage of

labor costs applicable to each facility under the Company's unitization procedures and our attempt to track such procedures. This exhibit, which reflects very little difference between the percentages, indicates that we were able to closely follow the Company's methods.

Q. Up to this point, you have discussed how you accumulated the April 1981 and October 1984 labor costs applicable to each facility. Once you had accumulated these costs, how did you go about determining the amount of labor costs associated with not meeting the 1981 in-service date?

A. Accumulation and allocation of the labor hours and costs was by far the most difficult and time consuming portion of our work. To quantify the labor costs associated with not meeting the 1981 in-service date, we developed hourly wage rates for each of the nine manual labor accounts and also for non-manual labor. These hourly wage rates were calculated based on the project-to-date labor hours and costs as of April 1981 and October 1984. The April 1981 average labor rates were then subtracted from the October 1984 rates to arrive at the experienced per hourly increase. This increase was then multiplied by the actual hours worked between April 1981 and October 1984 to arrive at the costs of labor associated with not meeting the 1981 in-service date. Exhibit DPD-11 is an example of this quantification method. Exh. DPD-12 summarizes all labor costs associated with not meeting the April 1981 in-service date.

Q. Please continue with an explanation of how you accumulated the Bechtel project to date material and subcontract costs as of April 1981 and October 1984.

A. These costs were obtained from Bechtel's Material and Subcontract Costs and Commitment Ledger, the 330R Report. The costs recorded in the 330R

report are charged to ten major accounts. Within these ten major accounts are 53 subaccounts. Staff Exh. DPD-13 lists the ten major and 53 subaccounts used in the 330R report. We accumulated the costs charged to these accounts and subaccounts under the categories of direct, TO Suspense 10-80, and TO 90 - distributable charges. As in the case of labor costs, direct charges were specifically identified in the 330R as being applicable to either Unit 1, 2 or Common (Staff Exh. DPD-5). The remaining charges were not so identified and had to be allocated to the various facilities. Because the 330R did not contain separate totals for the various categories of charges contained therein (Staff Exh. DPD-13) we were required to review approximately 2,000 ledger pages to accumulate these costs. Once these project to date material and subcontract costs as of April 1981 and October 1984 were accumulated, the non-direct charges were then allocated to the various facilities. The material and subcontract costs directly charged to Units 1, 2 and Common as of April 1981 and October 1984 were as follows:

	October 1984	April 1981
Unit 1	$120,406,734	$ 55,759,904
Unit 2	58,782,276	32,307,934
Common	109,726,308	49,163,059
TOTAL	$288,915,318	$137,230,897

The $288,915,318 represents 37.3% of the total Bechtel material and subcontract charges applicable to Units 1, 2 and Common as of October 1984.

Q. Please continue with an explanation of how you allocated TO 10-80 charges as of April 1981 and October 1984.

A. Our first step was to determine the difference between the project to date balances of TO accounts 10 through 80 as of April 1981 and October 1984. Once this difference was determined, costs were allocated as described below:

1) TO accounts 10, 20, 50, 60 and 80 were allocated based on the unitized installed quantities per the Focus Report as of October 1984.

2) TO 30 (Nuclear Steam Supply System) was assigned completely to Unit 1 because the difference between the April 1981 and October 1984 amounts in this account was only $728,050.

3) TO accounts 40 and 70 were unitized based on the ratio of each facility's direct material and subcontract charges to the total material and subcontract charges recorded in TO accounts 40 and 70, respectively. Staff Exh. DPD-14 reflects examples of the two allocation methods. As indicated by Staff Exh. DPD-9, the Company's procedure for unitizing material and subcontract costs were much more complex and involved than the three methods described above. However, in most instances, installed quantities per the "FOCUS" report were used by the Company as the basis for unitizing TO costs. The FOCUS report's installed quantities were used by us for the majority of our TO 10-80 cost unitization. TO costs 10 through 80 represented 32.3% of the total Bechtel materials and subcontract charges applicable to Units 1, 2 and Common as of October 1984.

Q. Please explain how you allocated the TO-90 costs to Units 1, 2 and Common?

A. The TO-90 account includes such items as Temporary Construction Facilities, Miscellaneous Construction Services, Construction Equipment and Office Equipment and Supplies. Staff Exh. DPD-13 lists all the subaccounts included in TO-90. The Company's method of unitizing the TO-90 costs is reflected on Exh. DPD-9, Section F.9. As indicated by Section F.9, certain costs are excluded from the unitization of charges to the TO-90 account. The Company, of course, does not merely forget about these

charges but includes them in the unitization of distributable costs included in such items as manual and non-manual labor. These costs excluded by the Company when allocating the TO-90 charges totaled approximately $23.7 million at October 1984.

We included the $23.7 million when unitizing the TO-90 costs. Our unitization method for all TO-90 charges was based on the ratio of direct manual labor dollars determined as of October 1984. We selected this method because it closely tracked the Company's method used to unitize the majority of TO-90 costs. An example of our TO-90 cost unitization method is reflected on Exh. DPD-15.

Q. Once you had accumulated and unitized the material and subcontract costs, how did you then determine the costs of these items associated with not meeting the April 1981 in-service date.

A. As in the case of our quantification of the labor costs, our determination of material and subcontract costs resulting from not meeting the 1981 in-service date was based on the assumption that all actual quantities of material used were reasonable.

Quantifying these costs was simply a matter of adjusting the post-April 1981 expenditures for applicable inflation factors. These inflation factors were obtained by using Table 6 of the "Producer Prices and Price Indexes" published by the U.S. Department of Labor. Staff Exh. DPD-16, 17 reflects examples of how the producer price indices were used to assign that portion of the post April 1981 costs as being applicable to not meeting the 1981 in-service date.

Q. How were you able to determine what producer price index to apply to the post April 1981 cost for all the various types of materials required to construct the Limerick project?

A. We inquired of the of the Company what producer price commodity codes most closely corresponded to the cost codes reflected on the Limerick Material and Subcontract Summary Code of Accounts (Exh. DPD-18). In most instances, we used the applicable commodity code supplied by the Company. For some items of material, we used codes other than those supplied to us. For example, the Company-supplied commodity code for Permanent Forms (Metal Decking) was 1079-"Prefabricated Metal Buildings." Because there was no 1079 code for April 1981, we utilized the more general code 10 - "Metal and Metal Products." Exhibit DPD-18 also reflects the producer price commodity codes used in our analysis.

Two items concerning our quantification of the material and subcontract costs are important to note. First, the use of the producer price indices only approximates the increased material and subcontract costs associated with not meeting the 1981 in-service date. This is due to the fact that approximately 50,000 codes were utilized to record Limerick costs. We did not attempt to assign producer price commodity codes to all of the Limerick cost codes but rather to only the 53 major cost codes. The second item of note regards the method used in applying the indices to the post April 1981 costs. This method consisted of comparing the applicable commodity code indices for April 1981 and October 1984. Once the difference between these two indices was determined, the calculated percentage change was then applied to the post April 1981 costs. The resulting amount, summarized by the 53 cost codes, equals the costs associated with not meeting the April 1981 in-service date.

Q. Doesn't your method assume that all post April 1981 material and subcontract costs were incurred in October 1984?

A. The use of the October 1984 indices does assume that all post April 1981 costs were incurred in October 1984. Since costs were incurred throughout the 42 month period ending October 1984, this would tend to overstate our costs quantification. On the other hand, this overstatement is offset by the assumption that all of these costs should have been spent in April 1981. In other words, the use of only the October 1984 indices, as opposed to using indices applicable to all 42 months from April 1981 through October 1984, overstates the costs quantification. Use of only the April 1981 indices versus indices applicable to each of the 42 months prior to April 1981 understates our costs quantification. Exhibit DPD-19 summarizes our costs of materials and subcontracts associated with not meeting the April 1981 in-service date.

Q. How did you accumulate and unitize the Bechtel Home Office costs?

A. These costs were obtained from Bechtel's 330R report. The 330R report records this cost in approximately 200 subaccounts. Although the Company's unitization procedures (Section D, Exhibit DPD-9) indicated that some of the charges contained in the various subaccounts were specifically identified as being applicable to either Unit 1/Common and Unit 2 the 330R ledger did not specifically identify such charges. Consequently, we were required to unitize all Home Office costs.

Q. How did you unitize the Home Office costs?

A. These costs were allocated to Unit 1/Common based on their ratio of the total Home Office costs. The total Home Office costs as of October 1984 were obtained from the Company (Exh. DPD-20), while Unit 1/Common costs were obtained from the Company's Bi-monthly Report No. 4 as submitted to the Commission. Once this allocation was made, Unit 1/Common

Home Office costs were unitized to these individual facilities based on the percentages utilized by the Company in its June 30, 1984 Unitized Cost Study.

Q. Once these costs were accumulated and unitized, how did you determine the amount of Home Office costs associated with not meeting the April 1981 in-service date?

A. The quantification of the Home Office costs was based on the ratio of the total non-manual labor costs incurred after April 1981 to that portion of these costs calculated by us as being attributable to the delays. We elected to use this ratio because we assumed that the Home Office costs consisted primarily of non-manual labor charges. Exhibit DPD-21 reflects both the unitization and cost quantification of the Home Office costs.

Q. So far you have addressed all the direct costs with the exception of the PECO directs. Please explain how you quantified the PECO direct costs associated with not meeting the 1981 in-service date?

A. The quantification of the PECO direct costs was determined in a manner similar to that used to quantify the Bechtel direct costs. Project to date PECO expenditures as of April 1981 and October 1984 were obtained from the Company's Engineering and Research Department Report (E&R Report). We accumulated these direct costs by the 56 subdivisions reflected in the E&R report, Exhibit DPD-22.

Q. Once you had accumulated the applicable PECO direct costs, how were such costs unitized?

A. The first step in the unitization process was to obtain from the Company the amount of the PECO direct costs at October 1984 applicable to Unit 1/ Common and Unit 2. Based on this information, we developed percentages

reflecting Unit 1/Common and Unit 2's portion of the total. We then applied these percentages to the April 1981 balance. To determine Unit 1/Common's portion of the total applicable to each one of these facilities, we applied percentages obtained from the Company. These percentages reflected Unit 1 and Common's portion of the October 1984 PECO direct cost balance. These same percentages were then used to determine the portion of the April 1981 balance applicable to Unit 1 and Common. Once this allocation was performed, the difference or the post April 1981 expenditures were determined by subtracting the April 1981 balance from the October 1984 balance. Exhibit DPD-23 is an example of this unitization method.

Q. Once you had unitized the PECO direct costs and obtained the post April 1981 expenditures, how did you determine what portion of the post April 1981 costs were associated with not meeting the 1981 in-service date?

A. The first step was to relate the post April 1981 costs per the E&R report's 56 subdivisions to each of the 14 PECO direct cost categories reflected on the Company's Bi-Monthly Reports on the status of the Limerick project as submitted to the Commission. We performed this step based on the Company's method of condensing the E&R report's work order subdivisions into the Bi-monthly Report's 14 direct cost categories (Exh. DPD-24). Quantification of these 14 cost categories was then determined based on appropriate percentages obtained as a result of our prior cost quantification. For example, the total increased cost between April 1981 and October 1984 for Unit 1 Construction Supervision was $3,970,069. We assumed this item consisted primarily of non-manual labor charges. Based on this assumption, we determined that $783,294 of the $3,970,069 was the result of not meeting the April 1981 in-service date. This determination was made as follows:

÷	Bechtel Non-manual Labor Costs Associated with not meeting 1981 in-service date	$ 30,704,382
	Total Bechtel Non-manual Labor Costs Incurred between 4-81 and 10-84	$155,631,924
=	Per Cent of Total	19.73%
X	Total PECO Construction Supervision Costs Incurred between 4-81 and 10-84	$ 3,970,069
=	PECO Construction Supervision Costs Associated with not meeting 1981 in-service date	$ 783,294

Exhibit DPD-25 summarizes the cost quantification for the 14 PECO direct cost categories.

Q. You have indicated that your quantification of the costs associated with not meeting the April 1981 in-service date required you to review a tremendous number of ledger pages and in some instances, unitize costs in a manner not identical to that employed by the Company. Did you perform any verification regarding the accuracy of your numbers transcribed from the ledger pages or the reasonableness of your unitization methods?

A. We determined both the accuracy and reasonableness of our work in a number of ways. Our primary verification of the project to date totals at October 1984 was to compare our Bechtel and PECO direct cost amounts with these amounts reported to the Commission on Table C-2 of the Company's Bi-Monthly Report No. 4. Table C-2 (Exh. DPD-26) indicates that the October 1984 project to date direct cost totals for Unit 1 and Common was $2.155 billion. After compiling the project to date costs from the various ledgers, and performing the necessary unitization, our October 1984 direct cost totals for Unit 1 and Common was $2.170 billion. Our method of accumulating and unitizing the project to date costs up through October 1984 results in a difference of only $15 million or 0.07% more than that reported by the Company. In my opinion, this indicates that our cost accumulation and unitization methods were very accurate and reasonable.

Q. You stated that you verified the accuracy and reasonableness of your direct cost balances at October 1984. Did you also perform such verification for the direct costs at April 1981?

A. We were able to verify the accuracy of our accumulated costs as of April 1981. This verification was done by comparing our accumulated total costs per the LD-160 and 330R ledgers to the Bechtel labor and material costs summarized in the April 1981 E&R report. Because there was no Company performed unitization as of April 1981, we were unable to compare our Unit 1 and Common direct cost balances with any Company generated balances. Even though this data was unavailable to us (Exh. DPD-27), I believe our methods used to unitize applicable costs as of April 1981 were reasonable. This is because the methods used for the 1981 costs were consistent with the methods employed to unitize applicable costs as of October 1984.

Q. You have explained how you quantified all the direct costs associated with not meeting the April 1981 in-service date. How was this cost quantification determined for the indirect costs of AFUDC, Overheads and Taxes?

A. As indicated in the Quantification Method-General Section, overheads and taxes were not included in our cost quantification analysis. Also, included in this section, is a fairly comprehensive description of how we determined the amount of AFUDC associated with not meeting the 1981 in-service date. Rather than reiterate this description, Exhibit DPD-28 presents the actual calculations used to quantify the AFUDC costs. In regard to this Exhibit, two items should be noted. First, because we worked with actual data up through October 1984, we were able to give the Company credit for AFUDC on post April 1981 reasonable costs only up through October 1984. Assuming that a portion of the costs incurred

after October 1984 were also reasonable, then our AFUDC quantification is slightly overstated. Second, when calculating the additional amount of AFUDC that would have accrued had Unit 1 and Common been completed by April 1981, we assumed that the post April 1981 reasonable costs were all spent on the first day of each applicable six month period. This assumption results in an overstatement to our post April 1981 AFUDC credit (Exh. DPD-29). The overstatement of AFUDC applicable to the post April 1981 reasonable costs results in an understatement to our quantification of the AFUDC costs associated with not meeting the 1981 in-service date.

Q. Have you completed your explanation of the methodology used to arrive at a completion cost differential of $1,119,687,820?

A. Yes.

Q. Have you any further comments with respect to the analysis performed under your supervision?

A. Yes, I do. I believe for a number of reasons, that our method used to quantify the costs associated with not meeting the April 1981 in-service date results in a very reasonable approximation of such costs. First, we did not rely on any "crystal ball" and implied data, but rather on actual data obtained directly from the project's ledgers. Second, extreme care was taken to ensure that we accurately compiled the data contained in these ledgers. The fact that we were able to so closely tie into the ledger totals and the Bi-monthly Report No. 4 reflects this accuracy. Third, although our method was conceptually simple, there were some areas, such as the allocation of costs between facilities, which required complex mechanical calculations. In these areas, extreme

care again was taken to utilize an allocation method which resulted in unitized costs closely matching these costs developed by the Company. This care and accuracy again is demonstrated by the fact that our project to date unitized costs so closely relate to these costs reported by the Company on Bi-Monthly Report No. 4.

Q. Does this conclude your testimony?

A. Yes, it does.

APPENDIX A

I. General Educational Background:

1976 - Bachelor of Science in Accounting from York College of Pennsylvania, York, Pennsylvania

II. Seminars pertaining to public utility regulations:

A. Physical Functioning of Public Utility Equipment sponsored by the Pennsylvania State University Continuing Education Program.

B. Cost of Service and Accounting in the Regulated Industry by Gordon F. Heim of Coopers & Lybrand.

C. Operational Auditing sponsored by the Graduate School, United States Department of Agriculture.

D. Developing and Presenting Audit Findings sponsored by the Graduate School, United States Department of Agriculture.

E. Interviewing Techniques for Auditors sponsored by the Graduate School, United States Department of Agriculture.

III. Proceedings before the Pennsylvania Public Utility Commission in which testimony was presented:

1. Pa. PUC v. Citizens' Electric Company of Lewisburg, Pa. D-78060372

2. Pa. PUC v. West Penn Power Company, R-811836

3. Public Hearing under Section 1307(e) of the Public Utility Law, M-FCAG0001

4. Public Hearing under Section 1307(e) of the Public Utility Law, M-FCAS0001

5. Public Hearing under Section 1307(e) of the Public Utility Law, M-FCAG8004

6. Investigation of the Reasonableness of the Cost of Quarto Mine Coal, I-80120343

7. Pa. PUC v. Duquesne Light Company, R-842583

8. Pa. PUC v. Pennsylvania Power Company, R-842740

9. Pa. PUC v. Pennsylvania Power Company, M-850011

10. Pa. PUC v. Philadelphia Electric Company, M-850010, et al.

LABOR AND MATERIAL

SAMPLE CALCULATION OF COSTS ASSOCIATED WITH NOT MEETING AN IN-SERVICE DATE OF APRIL 1981

LABOR

Account 50-Piping-Unit 1

Project to Date

	HRS.	$	$/HR.
October 1984	6,578,153	$135,431,396	$20.5881
April 1981	2,763,950	44,628,360	16.1466
Increase in Labor Hours	3,814,203		$ 4.4415
Increase in Labor Rate	X $4.4415		
Cost Associated With Not Meeting April 1981 In-Service Date	$16,940,783		

Materials

Account 23 - Architectural Features And Finish

Project to Date

		$
October 1984		22,385,958
April 1981		7,520,428
Total Increased Cost		$14,865,530
Producer Price Index At: 10/84	306.2	
4/81	293.4	
Net Change	12.8	
Percentage Change (Net Change ÷ 4/81 Index)	4.36	
Increase Cost in 1981 Dollars $14,865,530 Divided by 1.0436		-14,244,471
Cost Associated With Not Meeting April 1981 In-Service Date		$ 621,059

Rec'd 3-20-85

DR-Staff-Construction-36

Q.DR-Staff-Construction-36. RE: "Bimonthly Report #4 to PAPUC" Status of the Limerick Project

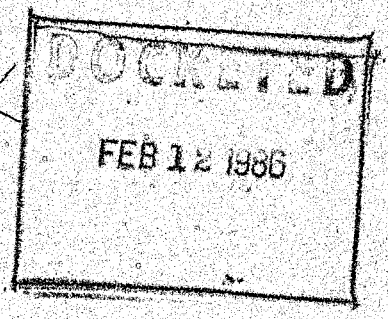
A) What are the sources of the numbers reflected on Table C-2 under the column headed: To-Date-Total-Acct.? Were the Bechtel manual and non-manual labor expense taken from the Labor Ledger 60? If not, from what document were these numbers taken? Were the subcontracts and material expenses taken from the Material and Subcontract Ledger 330-R? If not, from what document were these numbers obtained? What are the titles of the source documents from the remaining numbers reflected under the To-Date-Total-Acct. column on Table C-2?

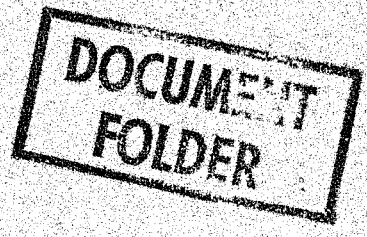
B) Will the various source documents listed in response to A) alone, be the primary source for developing the dollar amount of later additions for the Limerick Station for rate making purposes?

A.DR-Staff-Construction-36A) The LD 160 and 330 R were the sources for all Bechtel costs. PECo costs are from the E&R Monthly Expenditure Report.

B) Yes, these documents will be used for the final cost of Limerick 1 after segregating the Unit 1 & C portion.

OK





PECO EXPENDITURES

SAMPLE CALCULATON OF COST ASSOCIATED WITH NOT MEETING AN IN-SERVICE DATE OF APRIL 1981

	PECO ENGINEERING COSTS-UNIT 1 PROJECT TO DATE
Balance at October 1984	$50,239,387
Balance at April 1981	21,642,708
Total Increased PECO Engineering Costs	$28,596,679
Ratio of Bechtel Non Manual Costs of Delay to Total Post 1981 Bechtel Non Manual Costs	X 19.73%
Cost Associated With Not Meeting April 1981 In-Service Date	$ 5,642,125

LIMERICK UNIT 1 AND COMMON

TOTAL COSTS ASSOCIATED WITH NOT MEETING AN IN-SERVICE DATE OF APRIL 1981

DESCRIPTION	UNIT 1	COMMON	TOTAL
Bechtel:			
Manual and Non Manual Labor	$63,028,082	$27,661,004	$90,689,086
Material, Subcontract and Home Office	41,984,345	22,291,982	64,276,327
SUBTOTAL Bechtel	$105,012,427	$49,952,986	$154,965,413
PECO:			
Direct Costs	$26,701,285	$ 11,068,492	$ 37;769,777
AFUDC	625,716,343	301,236,287	926,952,630
SUBTOTAL PECO	$652,417,628	$312,304,779	$964,722,407
TOTAL	$757,430,055	$362,257,765	$1,119,687,820

Rc'd 2-28-85

Q.DR-Staff-Construction-39. Please provide written confirmation that charges made to cost codes (with a 1 in the first digit) in reports LD-160 (Labor Ledger) and (330-R Material and Subcontract Ledger) are for Unit 1 and charges made to cost codes (with a 9 in first digit) are for Common Facilities?

A.DR-Staff-Construction-39. The above statement is correct.

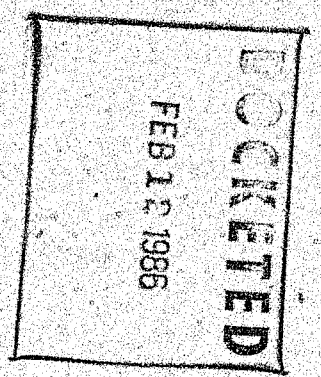
OK

MANUAL LABOR

DIRECT CONCRETE LABOR HOURS AND COSTS - UNIT 1

AT APRIL 1981 AND OCTOBER 1984

	DESCRIPTION	TOTAL AT 10/84 HRS.	TOTAL AT 10/84 $	TOTAL AT 4/81 HRS.	TOTAL AT 4/81 $	INCREASE HRS.	INCREASE $
T 1							
1000	Containment	194,583	$ 2,467,337	194,252	$ 2,453,263	331	$ 14,074
1000	Reactor	792,096	10,721,964	759,132	10,067,368	32,964	654,596
1000	Turbine	324,767	4,013,777	312,884	3,777,204	11,883	236,573
1000	Turbine Aux. Enclosure	221,156	2,790,403	218,078	2,727,591	3,078	62,812
1000	Diesel Generator Enclosure	77,486	1,189,286	69,989	1,051,127	7,497	138,159
1000	Cooling Tower	1,692	19,359	1,692	19,359	-0-	-0-
1000		5,209	84,412	2,565	41,183	2,644	43,229
1000	Transformers	7,855	111,098	7,855	111,098	-0-	-0-
TOTAL DIRECT CHARGES UNIT I-CONCRETE (XX1)		1,624,844	$21,397,636	1,566,447	$20,248,193	58,397	$1,149,443



E.6

UNITIZATION OF TO-1 THROUGH 8 MANUAL LABOR CHARGES
EXAMPLE BASED ON TO 5 ACCOUNT
AT OCTOBER 1984

METHOD USED FOR TO ACCOUNTS 5 AND 8

		UNIT 1	UNIT 2	COMMON	TOTAL
TO 5 Direct Manual Labor		$129,762,973	$14,046,552	$23,915,099	$167,724,624
TO 5 Account Charged Direct	(A)	18,941,337	1,759,383	4,894,445	25,595,165
Total Amount Charged Direct		$148,704,310	$15,805,935	$28,809,544	$193,319,789
Percent of Each Facility's Contribution to Total		76.9%	8.2%	14.9%	100.0%
TO 5 Account Not Charged Direct to Any Facility		$ 10,835,380	$10,835,380	$10,835,380	$ 10,835,380
TO 5 Account Unitized	(B)	$ 8,332,407	$ 888,501	$ 1,614,472	$ 10,835,380
Total Unitized TO 5 Account	(A)+(B)	$ 27,273,744	$ 2,647,884	$ 6,508,917	$ 36,430,545

METHOD USED FOR TO ACCOUNTS 1,2,3,4,6 AND 7

	UNIT 1	UNIT 2	COMMON	TOTAL
Direct Manual Labor	$129,762,973	$14,046,552	$23,915,099	$167,724,624
Percent of Each Facility's Contribution to Total	77.4%	8.4%	14.2%	100.0%
Total (Direct And Non-Unitized) TO 5 Account	$ 36,430,545	$36,430,545	$36,430,545	$ 36,430,545
Total Unitized TO 5 Account	$ 28,197,242	$ 3,060,166	$ 5,173,137	$ 36,430,545

UNITIZATION OF TO-9 DISTRIBUTABLE LABOR CHARGES
EXAMPLE BASED ON SUB ACCOUNT TO-9.2 "MISCELLANEOUS CONSTRUCTION FACILITIES"
AT OCTOBER 1984

	UNIT 1	UNIT 2	COMMON	TOTAL
Total Unitized Manual Labor Costs Excluding TO-9 Distributables	$323,917,110	$61,273,278	$135,637,434	$520,827,822
Total Unitized TO-9.2 Distributable Costs	20,916,704	4,683,367	16,977,596	42,577,667
Total Unitized Manual Labor	$344,833,814	$65,956,645	$152,615,030	$563,405,489
Each Facility's Contribution to Total	61.2%	11.7%	27.1%	100.0%
Non Unitized TO-9.2 Costs	$ 46,297,286	$46,297,286	$ 46,297,286	$ 46,297,286
Each Facility's Allocation of Non Unitized TO-9.2 Costs	$ 28,333,939	$ 5,416,782	$ 12,546,565	$ 46,297,286
Each Facility's Unitized TO-9.2 Costs	7,496,910	2,353,417	7,179,749	17,030,076
Each Facility's Total TO-9.2 Costs	$ 35,830,849	$ 7,770,199	$ 19,726,314	$ 63,327,362

Philadelphia Electric Company
Limerick Generating Station
Units I & II - Job 08031
Unitization of To Date Costs
At end of September, 1983

Procedure

General

Bechtel costs to date reconcile to the inception (end of September 1983) provided by Bechtel accounting.

PECo costs to date reconcile to the PECo C. A. #0911 01 C&C Report with adjustments made for "Advance payments B-Corp." and "Construction B-Corp." (i.e. Bechtel Fee) and with minor noted corrections to the PECo information, corrections to PECo cost information were discussed with R. A. Mulford.

A. Manual Labor

A.1 Direct Manual Labor (Payroll & Additives)

Direct Manual Labor dollars were procured from the month end labor ledger (LD-160) and unitized by cost code.

A.2 Distributable Manual Labor (Payroll & Additives)

Distributable Manual Labor dollars were procured from the month end labor ledger (LD-160) and unitized in the following manner:

1) 49% was unitized by cost code
2) 51% was unitized by prorating against the sum of direct manual labor dollars and unitized distributable manual labor dollars.

A.3 GPMA Manual Labor (Payroll & Additives)

GPMA Manual Labor dollars were procured from the month end labor ledger (LD-160) allocated 100% to Unit I and Common, and prorated between Units I and Common against direct labor.

A.4 Liability Insurance

Total Liability Insurance dollars were procured from the month and 330 report and prorated between manual and non-manual labor and by unit against labor dollars. (Labor related insurances only - balance with material)

A.5 Payroll Tax Adjustment

Total Payroll Tax Credits were procured from Bechtel Accounting and prorated against manual labor dollars.

B. Field Non-Manual

B.1 Field Non-Manual Labor (Salaries & Additives)

Non-Manual labor dollars were procured from the month end labor ledger (LD-160) (burden, fee and other direct costs associated with field non-manual are included) Dollars were frozen at 5/31/83 and thereafter Unit II totals obtained from FOCUS. Unit I & Common were obtained from FOCUS and prorated against manual labor dollars.

Philadelphia Electric Company
Limerick Generating Station
Units I & II - Job 08031
Unitization of To Date Costs
At end of September 1983

Procedures

B.2 Field Burden
Field Burden dollars were frozen at 5/31/83 and prorated against non-manual dollars. Thereafter distribution was recorded monthly by Bechtel Accounting and matches the month end cash flow.

B.3 Liability Insurance
See Section A.4

B.4 Job Shoppers
Total Job Shopper dollars were procured from the month end cash flow worksheet from Bechtel Accounting and prorated against non-manual dollars.

C Field Start-Up Engineers (unit price)
Total Field Start-Up engineering dollars were procured from the month end cash flow worksheet from Bechtel Accounting, allocated 100% to Unit I and Common and prorated between Units I and Common against manual labor dollars.

D Engineering and Other Home Office
Total Engineering and Other Home Office dollars were procured from the month end cash flow worksheet from Bechtel Accounting. Dollars through December 31, 1982 were allocated per the unitized cost study as of the same date. As of January 1, 1983 manhours were coded to Unit I and common or Unit II. Allocation to Unit I and Common was made based on a proration against manual labor dollars. (Costs include salaries additives, burden, and other direct costs)

E Subcontracts
Total Costs to date for individual subcontracts were procured from the month end 330 report (special subcontract sort) and were allocated as follows:
1) unitized costs were directly allocated
2) "TO" or suspense costs were allocated based on quantities where applicable or prorated based on unitized costs above
3) project distributable subcontract costs were prorated based on manual labor dollars
4) ADWIN costs were prorated based on 30, 40, and 70 account unitized material dollars

F Materials

Total to-date costs for individual commodities were procured from the month end 330 report and allocated to units as described below:

F.1 Concrete

F.1.1 Formwork

To date costs for formwork were unitized based on installed quantities per "FOCUS".

F.1.2 Metal Deck/Steel Liner

To date costs for metal deck and steel liner were unitized based on installed quantities per "FOCUS".

F.1.3 Rebar

To date costs for rebar, cadwelds, wire mesh and misc. rebar materials were unitized based on installed rebar quantities per "FOCUS".

F.1.4 Embeds

To date costs for embeds were unitized based on installed quantities per "FOCUS".

F.1.5 Concrete & Misc. Concrete Materials

To date costs for concrete and misc. concrete materials were unitized based on installed concrete quantities per "FOCUS". The cost of fillcrete was isolated by examining the total installed quantity from "FOCUS" and the known quantity purchased off site from a vendor. The jobsite batched quantity was isolated and multiplied by $20 per cubic yard (Fcst No. 6 unit cost), deducted from dollars to be allocated per "FOCUS" and allocated uniquely to common.

General Note(Applies to all commodities)

Any Unit 2 commodity costs tending to decrease because of the method of unitization were "frozen" at the appropriate value calculated at December 31, 1982. Cost transfers required to accomplish the "freezing" were made proportionately from Units 1 & Common.

F.2 Civil

F.2.1 Earthwork and General Civil

To date costs were all coded to Common.

F.2.2 Structural Steel and Miscellaneous Iron

To date costs were broken down as follows and unitized per installed quantities from "FOCUS":

1) Structural Steel
2) Miscellaneous Iron
3) Pipe Restraints

To date costs for Reactor shield doors were unitized per cost codes.

F.2.3 Architectural Finishes

To date costs were broken down as follows:

1) Precast Wall Panels
   To date costs were too low for quantities in "FOCUS" - it was therefore assumed that the dollars represent replacement panels only and were prorated against installed quantities per "FOCUS".

2) Paint - Structural Steel
To date costs were prorated against installed quantities of structural steel, miscellaneous iron, and pipe restraints per "FOCUS".

3) Epoxy Paint - Concrete
To date costs were prorated against installed quantities of structural concrete (excl. fillcrete).

4) Balance
The balance of the to-date costs were allocated by cost code - common receiving $1.2 million; the balance split 50/50 between Units 1 and 2.

F.3 N.S.S.S.

To date costs were unitized based on cost codes.

F.4 Mechanical Equipment

4800 - Unitized Costs To Date
Since last unitized cost to date study (as of 6/1/83), Home Office P.O.'s and most major P.O.'s by field have been individually reviewed and allocated by unit and facility. 330 report is being revised.

4100-4700, 4900 -
All Home Office P.O.'s and most major field P.O.'s have been reviewed and posted in proper unit. 330 report is being revised to pick up these changes.

F.5 Piping

F.5.1/2 Large Pipe

To date costs would normally be prorated against "received status" in the "QTS File". Very little quantity activity was evident since the unitized cost study at December 31, 1982 indicating that cost activity represents materials such as fittings and possibly escalation. Therefore, judgement was used to unitize the costs since December 31, 1982 which were then added to the unitized totals at December 31, 1982.

F.5.3 Small Pipe

To date costs were prorated against "purchased quantities" which were unitized on the following basis:

1) Installed quantities were allocated to units per "FOCUS".
2) Historical waste was estimated and added to installed quantities
3) To go quantities and estimated waste to go were then added from known inventory Unit 1 first, Common second, Unit 2 last.
4) If inventory information indicated a total project surplus, that surplus was allocated to units based on a proration against Forecast 6-2.

Each small pipe material was examined individually (ie. carbon steel, stainless steel, copper & brass, alloy). Mechanical and instrumentation small pipe were examined together for the purpose of quantity and material cost allocation. The resulting allocation was then prorated back into the respective accounts based on total small pipe dollars in each account.

F.5.4 Valves

F.5.4.1 Large & Auto Actuated (Large & Small)

To date costs were prorated based "received status" in the "QTS File" without regard to size or type. Instrumentation large valves also included in the "QTS File" were isolated through use of the "engineering status report" available from the field large pipe engineering group, and excluded for use with the instrumentation account allocation.

F.5.4.2 Small Manual Valves

To date costs were prorated against "purchased quantities" which were unitized on the following basis:

1) Frequencies were determined for valves from material review backup
2) These frequencies were used to estimate the unitization of valves based on small pipe installation footage.

2a) Installed quantities were allocated to untis per "FOCUS" small pipe footage
2b) Historical waste was estimated and added to installed quantities
2c) To go quantities and estimated waste to go were then added from known inventory
2d) Inventory information indicated a total project surplus that was allocated to units based on a proration against Forecast 6-2 small pipe quantities.

F.5.5 Hangers (Large & Small Pipe)

To date costs for large and small pipe hangers are not segregated. The following procedure was used to unitize these costs:

1) Large pipe hanger installed quantities were allocated to units per "FOCUS"
2) Small pipe hanger installed quantities were estimated and allocated to units per "FOCUS" hangered small pipe quantities
3) Assuming a 5 to 1 cost-ratio between large and small pipe hangers, total account dollars were unitized
4) Inventory was ignored in the detailed analysis - a summary level adjustment was made to recognize inventory available for Unit 2

F.5.6 Pipe Insulation and Misc. Piping Materials

To date costs were prorated against material dollars of the large and small pipe accounts.

F.5.7 Misc. Common Piping

To date costs were coded to common facilities.

F.6 Instrumentation

F.6.1 Instrument Tubing

To date costs were prorated against "purchased commodities" which were unitized on the following basis:

1) Installed quantities were allocated to units per "FOCUS"
2) Historical waste was estimated and added to installed quantities

3) To go quantities and estimated waste to go were then added from known inventory
4) Inventory information indicated a total project surplus that was allocated to units based on a proration against Forecast 6-2 quantities

Backup for this commodity is a short form of the above procedure.

F.6.2 Instrument Piping

See F.5.3

F.6.3 Instrument Large Valves (Control Valves)

Home office P.O. costs were allocated by unit based on received status of valves by P.O. Field costs were allocated based on Home Office P.O.'s.

F.6.4 Field Mounted Instruments

Home Office P.O.'s were reviewed individually for to date costs by unit. Field P.O.'s were prorated against "FOCUS" installed quantities as previously done.

F.6.5 Local Panel Boards

Home Office P.O.'s were reviewed individually and field P.O.'s were unitized by cost code. Unit identified in 330 report.

F.6.6 Racks, Tray and Supports

F.6.6.1 Tray

To date costs were unitized based on "purchased quantities" which were unitized on the following basis:

1) Installed quantities were allocated to units per "FOCUS"
2) Historical waste was estimated and added to installed quantities
3) To go quantities and estimated waste to go were then added from known inventory Unit 1 first, Common second, Unit 2 last.
4) If inventory information indicated a total project surplus, that surplus was allocated to units based on a proration against Forecast 6-2.

F.6.6.2 Racks and Supports

To date costs were prorated against installed quantities for "FOCUS" without regard for inventory.

F.6.7 Miscellaneous Instrumentation

Home Office P.O.'s were individually reviewed and field P.O.'s were spread based on Home Office P.O.'s and actual unitized costs.

Other

Accounts for instrument tubing, piping, tray and supports have had Home Office P.O. $'s separately treated by individual review. Remaining field P.O. $'s were allocated based on previous methods.

F.7 Electrical Equipment

Costs since December 31, 1983 were unitized essentially by cost code and added to the unitized cost at December 31, 1982.

F.8 Electrical Bulks

F.8.1 Cable Tray

To date costs were unitized on the same basis as F.6.6.1 tubing tray. Cable tray was examined by individual size.

F.8.2 Conduit

To date costs were unitized on the same basis as F.6.6.1 tubing tray. Conduit was examined by size range and type.

F.8.3 Gutter

To date costs were unitized on the same basis as F.6.6.1 tubing tray. Material dollars for pull boxes (20% of total) were prorated evenly with gutter.

F.8.4 Wire & Cable

To date costs were unitized on the same basis as F.6.6.1 tubing tray. The Bechtel portion of total wire and cable material dollars represented approximately 19% of total project wire and cable cost to date. The balance was PECo costs (purchased on PECo purchase orders). Details on PECo costs were acquired in backup to PECo cost and commitment documents. Source documents used as are follows:

1) 330 report
2) PECo CA #091101 cost and commitment report
3) Inventory status report (field procurement)
4) Weekly cable on hand report (field engineering)

F.8.5 Terminations

To date costs were prorated against wire and cable material dollars.

F.8.6 Lighting Fixtures and Accessories

To date costs were prorated against installed quantities per "FOCUS".

F.8.7 Miscellaneous Electrical Materials

To date costs were prorated against wire and cable material dollars.

F.9 Distributable Materials

To date distributable costs excluding inapplicable items like:

1) Non-manual burden
2) Labor related liability insurance
3) Start-up non-manual unit price & support material
4) Job shoppers
5) FSC 82 costs erroneously coded as a P.O. were prorated against to-date manual labor dollars

Direct By Manual Labor (excluding 95

LIMERICK GENERATING STATION
COST UNITIZATION
AT JUNE 30 AND OCTOBER 30, 1984

COMPANY UNITIZATION AT JUNE 30, 1984

ITEM	UNIT 1 DOLLARS	UNIT 1 PERCENT OF TOTAL	UNIT 2 DOLLARS	UNIT 2 PERCENT OF TOTAL	COMMON DOLLARS	COMMON PERCENT OF TOTAL	TOTAL DOLLARS	TOTAL PERCENT OF TOTAL
Labor:								
Manual	$368,367,000	59.4%	$72,064,000	11.6%	$179,941,000	29.0%	$620,372,000	100.0%
Non-Manual	145,190,000	61.3%	21,235,000	9.0%	70,360,000	29.7%	236,785,000	100.0%

STAFF UNITIZATION AT OCTOBER 30, 1984

Manual	$394,763,630	61.2%	$75,502,050	11.7%	$174,724,475	27.1%	$644,990,155	100.0%
Non-Manual	145,272,292	62 %	20,133,989	8.6%	68,993,625	29.4%	234,399,906	100.0%

EX. DPD-11

PECO - Limerick Unit 1 Rate Case

Calculation of Incurred Labor Hours & Cost Charged to Piping Accounts

10/31/84 vs. 4/30/81 Unit 1

Description		WP Ref	Total @ 10/31/84 Hours	Total @ 10/31/84 $ Amount	$/Hr	Total @ 4/30/81 Hours	Total @ 4/30/81 $ Amount	$/Hr	Increase Hours	Increase $ Amount	$/Hr (Col 7 - Col 10)	Incremental Cost Due to Hourly Rate (Col 11 x 12)
Unit 1												
1A600000	Unit 1 - Containment	LS-3/4	990,11.975	22335,204.82		270,135.00	4612,564.97		719,984.75	17722,639.85		
1B500000	Unit 1 - Reactor		2343,414.50	49814,096.49		966,166.75	16167,517.06		1377,248.75	33,646,579.43		
1F500000	Unit 1 - Turbine	LS-3/5	898,077.50	17,146,165.82		562,790.50	9061,374.68		335,287.00	8084,791.14		
1G500000	Unit 1 - Turbine Aux Enclosure		502,950.00	9310,580.03		347,759.25	5519,478.40		155,190.75	3791,101.63		
1H500000	Unit 1 - Diesel Generator Enclosure		186,002.56	4,105,149.56		47,162.75	853,628.31		138,839.81	3251,521.25		
1M500000	Unit 1 - Natural Draft Cooling Tower 1		3,100.25	71,708.73		44.00	788.12		3,056.25	70,920.61		
1N50000	Unit 1 -	LSD/2	916.50	20,549.37		130.00	2468.25		786.50	18,081.12		
Sub-Total / Direct Charges Total Unit 1		MLI-A1	4924,581.06	102,803,455.82	20.8756	2,194,187.75	36,217,819.79	16.5063	2730,393.31	66,585,635.03	4.3693	11,929,907.49
To 5000 "Piping Systems" Unitized by Cost Code		MLTO-3	1027,186.00	18941,336.41		338,086.75	4888,222.52		689,099.25	14,053,114.39		
To 5000 "Piping Systems" Not Unitized by Cost Code		MLTO-3	434,309.50	8332,407.19		231,675.75	3522,317.29		202,633.75	4810,089.90		
Sub Total Unit 1 Direct Charges plus Allocated to 5000			6386,076.56	130,077,198.92	20.3689%	2763,950.25	44,628,359.60	16.1466%	3622,126.31	85,448,839.32	4.2223 %	15,293,203.92%
Allocation of GC5000 & GP5000 Charges		GC/GP-2	192,076.50	5354,197.12					192,076.50	5354,197.12		
			6578,153.06	135,431,396.04	20.5881%	2763,950.25	44,628,359.60	16.1466%	3814,202.81	90,803,036.44	4.4415	16,940,732% (L-1)

Purpose: To accumulate the total labor hrs & costs for piping associated with Unit 1. From these totals an average labor cost per hour can be calculated as of 10/31/84 & 4/30/81. The difference between the average costs can be applied to hours charged subsequent to 4/30/81 (See Column 11) to reflect the

DPD-11

LIMERICK UNIT 1 AND COMMON-MANUAL AND NON-MANUAL LABOR CALCULATION OF COSTS ASSOCIATED WITH NOT MEETING AN IN-SERVICE DATE OF APRIL 1981

ACCOUNT	DESCRIPTION	UNIT 1	COMMON	TOTAL
XX-1	Concrete	$ 17,112	$ 161,804	$ 178,916
XX-2	Civil And Architectural Work	4,801,167	2,189,291	6,990,458
XX-3	Reactor Pressure Vessel	222,244	-	222,244
XX-4	Mechanical Equipment	2,290,021	959,520	3,249,541
XX-5	Piping	16,940,782	4,493,502	21,434,284
XX-6	Instrumentation	4,728,575	1,351,012	6,079,587
XX-7	Electrical Equipment	621,636	669,766	1,291,402
XX-8	Electrical Bulk Materials	7,666,226	3,380,629	11,046,855
XX-9	Distributables	6,117,853	3,373,564	9,491,417
NXX	Non Manual Labor	19,622,466	11,081,916	30,704,382
	Total Manual And Non Manual Costs Due to Delays	$63,028,082	$ 27,661,004	$ 90,689,086

LIMERICK GENERATING STATION
MATERIAL & SUBCONTRACT
SUPPLY CODE OF ACCOUNTS

CONCRETE - 10 ACCT.

xx11.	FORMS
xx12.	PERMANENT FORMS (METAL DECKING)
xx13.	REINFORCING STEEL
xx14.	EMBEDDED METAL
xx15.	CONCRETE
xx16.	WATER STOP & WATERPROOFING
xx17.	TENDONS

CIVIL & ARCHITECTURAL - 20 ACCT.

xx21.	EARTHWORK, DREDGING AND DEWATERING
xx22.	STRUCTURAL AND MISCELLANEOUS STEEL
xx23.	ARCHITECTURAL FEATURES AND FINISH

NUCLEAR STEAM SUPPLY SYSTEM - 30 ACCT.

xx31.	REACTOR PRESSURE VESSEL CATEGORY

MECHANICAL EQUIPMENT - 40 ACCT.

xx41.	TURBINE GENERATOR
xx42.	CONDENSER & AUXILIARIES
xx43.	ROTATING EQUIPMENT
xx44.	HEATERS & EXCHANGERS
xx45.	TANKS, DRUMS & VESSELS
xx46.	WATER TREATMENT & CHEMICAL FEED EQUIPMENT
xx47.	RADWASTE EQUIPMENT
xx48.	MISCELLANEOUS MECHANICAL EQUIPMENT (INCLUDING HEATING, VENTILATION AND ATMOSPHERIC CONTROL EQUIPMENT)

xx51.	LARGE PIPE 2 1/1" & OVER
xx53.	SMALL PIPE 2" & UNDER
xx54.	VALVES (LARGE AND SMALL)
xx55.	HANGERS
xx56.	INSULATION
xx57.	MISCELLANEOUS ENCLOSURES PIPING
xx58.	CIRCULATING WATER PIPE
xx59.	MISCELLANEOUS YARD PIPING

INSTRUMENTATION - 60 ACCT.

xx61.	MECHANICAL INSTRUMENTATION
xx62.	INSTRUMENT PIPING & TUBING
xx63.	ELECTRICAL INSTRUMENTATION
xx68.	MISCELLANEOUS INSTRUMENTATION MATERIALS

ELECTRICAL EQUIPMENT - 70 ACCT.

xx71.	SWITCHGEAR & LOAD CENTERS
xx72.	TRANSFORMERS
xx73.	BUS DUCT
xx74.	MOTOR CONTROL PANELS
xx75.	CONTAINMENT PENETRATIONS
xx77.	OTHER ELECTRICAL EQUIPMENT

ELECTRICAL BULK MATERIAL - 80 ACCT.

xx81.	CABLE TRAY
xx82.	CONDUIT
xx83.	~~GUTTER~~ Gutter
xx84.	WIRE & CABLE
xx85.	~~TERMINATIONS~~
xx86.	~~LIGHTING FIXTURES, RECEPTACLES & SWITCHES~~
xx87.	MISCELLANEOUS ELECTRICAL BULK

DISTRIBUTABLES - 90 ACCT.

xx91.	TEMPORARY CONSTRUCTION FACILITIES
xx92.	MISCELLANEOUS CONSTRUCTION SERVICES
xx93.	CONSTRUCTION EQUIPMENT
xx94.	OFFICE EQUIPMENT & SUPPLIES
xx95.	START-UP
xx96.	PAYROLL EXPENSES
xx97.	BACKCHARGES
xx98.	INSURANCE & TAXES
xx99.	EXTRA CONTRACTUAL FIELD COSTS

UNITIZATION OF TO 10-80 MATERIALS AND SUBCONTRACTS
EXAMPLE BASED ON SUBACCOUNT TO-61 - MECHANICAL INSTRUMENTATION
AT OCTOBER 1984

	UNIT 1	UNIT 2	COMMON	TOTAL
METHOD USED FOR TO ACCOUNTS 10,20,50,60,80				
Installed Quantities Sub Account 61 Per Focus Report	(each) 1,329	32	537	1,898
Each Facility's Contribution To Total	70%	1.7%	28.3%	100.0%
Dollar Amount of Cost Incurred After April 1981 - TO-61	$438,672	$438,672	$438,672	$438,672
Dollar Amount of TO-61 Allocated To Each Facility	$307,070	$ 7,458	$124,144	$438,672
METHOD USED FOR TO ACCOUNTS 40 AND 70				
Total Direct Charges Account TO-61	$2,293,865	$286,251	$860,043	$3,440,159
Each Facility's Contribution To The Total	66.7%	8.3%	25%	100.0%
Dollar Amount of Cost Incurred After April 1981 - TO-61	$ 438,672	$438,672	$438,672	$ 438,672
Dollar Amount of TO-61 Allocated To Each Facility	$ 292,594	$ 36,410	$109,668	$ 438,672

UNITIZATION OF TO-90 ACCOUNT - DISTRIBUTABLE MATERIALS
INCREMENTAL COSTS SUBSEQUENT TO APRIL 1981
EXAMPLE BASED ON SUB-ACCOUNT TO-93 - CONSTRUCTION EQUIPMENT

	UNIT 1	UNIT 2	COMMON	TOTAL
Direct Manual Labor Costs Allocated Each Facility At April 30, 1984	$394,763,630	$75,502,050	$174,724,475	$644,990,155
Each Facility's Contribution To Total	61.2%	11.7%	27.1%	100.0%
TO-93 Costs Incurred After April 1981	$ 24,359,776	$24,359,776	$ 24,359,776	$ 24,359,776
Unitization of Costs Incurred After April 1981	$ 14,908,183	$ 2,850,094	$ 6,601,499	$ 24,359,776

CALCULATION OF COMMON PLANT INFLATIONARY INCREASES OF MATERIAL AND SUB-CONTRACT COSTS SUBSEQUENT TO APRIL 1981
EXAMPLE BASED ON CODE 21-EARTHWORK

Total Common Plant Increase		$9,162,305
Producer Price Index:		
October 1984	374.9	
April 1981	321.4	
Change In Producer Index	53.5	
Percent Increase In Index	16.65%	
$9,162,305 Divided by 1.1665		7,854,526
Increased Cost Due To Not Meeting April 1981 In-Service Date - Common Plant - Code 21 - Earthwork		$1,307,779

CALCULATION OF UNIT 1 INFLATIONARY INCREASES OF MATERIAL AND SUB-CONTRACT COSTS SUBSEQUENT TO APRIL 1981 EXAMPLE BASED ON COST CODE 48 - MISCELLANEOUS MECHANICAL EQUIPMENT

Total Unit 1 Increase			$29,483,238
Producer Price Index:			
October 1984		125.4	
April 1981	(A)	103.0	
Change In Producer Index	(B)	22.4	
Percent Increase In Index (B)/(A)		21.75%	
$29,483,238 Divided by 1.2175			$24,216,212
Increased Cost Due To Not Meeting April 1981 In-Service Date - Unit 1 - Code 48 - Miscellaneous Mechanical Equipment			$ 5,267,026

Rec'd 3/2F/85

Q.DR-Staff-Construction-54. From Table 6 of the Producer Prices and Price Indices, please describe the commodity name and code which most closely corresponds to all of the accounts and subaccounts reflected in the Limerick Generating Station Material and Subcontract Summary Code of Accounts.

A.DR-Staff-Construction-54. The referenced Summary Code of Accounts consists of fifty-three(53) items. These items are a summary of the approximately fifty thousand (50,000) labor and material codes which are actually utilized on the Limerick Project. The referenced Table 6 consists of numerous general code categories which are further segregated into specific related items. Consequently, a one for one matching of actual individual Limerick codes and Table 6 codes has not been done. For purposes of this response, the Company, on Attachment DR-Staff-Construction-54, has taken each of the Summary Code of Accounts and associated it with the General Code from Table 6 that contains those specific items most likely to be found in that actual Limerick detail. The results of this association are very approximate. In other words, the Table 6 General Indices are not necessarily accurate reflections of price movements for items in the Limerick Summary Code of Accounts.

Attachment DR-Staff-Construction-54

LIMERICK GENERATING STATION
MATERIAL & SUBCONTRACT
SUMMARY CODE OF ACCOUNTS

		Company Indicated Producer Price Index General Code #	PUC Utilized Producer Price Index General Code #
	CONCRETE - 10 ACCT.		
xx11.	FORMS	0831	0831
xx12.	PERMANENT FORMS (METAL DECKING)	1079	10
xx13.	REINFORCING STEEL	1017	1017 & 1013
xx14.	EMBEDDED METAL	1076	1076
xx15.	CONCRETE	132	132
xx16.	WATER STOP & WATERPROOFING	0713	0713
xx17.	TENDONS	1017	1017 & 1013
	CIVIL & ARCHITECTURAL - 20 ACCT.		
xx21.	EARTHWORK, DREDGING AND DEWATERING	Misc.	1125
xx22.	STRUCTURAL AND MISCELLANEOUS STEEL	1017	1017 & 1013
xx23.	ARCHITECTURAL FEATURES AND FINISH	1074	1074
	NUCLEAR STEAM SUPPLY SYSTEM - 30 ACCT.		
xx31.	REACTOR PRESSURE VESSEL CATEGORY	1072	1072
	MECHANICAL EQUIPMENT - 40 ACCT.		
xx41.	TURBINE GENERATOR	1196	11
xx42.	CONDENSER & AUXILIARIES	1075	1075
xx43.	ROTATING EQUIPMENT	1141	1141
xx44.	HEATERS & EXCHANGERS	1075	1075
xx45.	TANKS, DRUMS & VESSELS	1072	1072
xx46.	WATER TREATMENT & CHEMICAL FEED EQUIPMENT	1166	1166
xx47.	RADWASTE EQUIPMENT	1168	11
xx48.	MISCELLANEOUS MECHANICAL EQUIPMENT (INCLUDING HEATING, VENTILATION AND ATMOSPHERIC CONTROL EQUIPMENT)	1181	1181

Page: 2
Subject: Material & Subcontract Summary Code of Accounts

		Company Indicated Producer Price Index General Code #	DOC Utilized Producer Price Index General Code #
	PIPING - 50 ACCT.		
xx51.	LARGE PIPE 2 1/2" & OVER	1017	1017 & 1013
xx53.	SMALL PIPE 2" & UNDER	1017	1017 & 1013
xx54.	VALVES (LARGE AND SMALL)	1149	1149
xx55.	HANGERS		1074
xx56.	INSULATION	1392	13
xx57.	MISCELLANEOUS ENCLOSURES PIPING	1017	1017 & 1013
xx58.	CIRCULATING WATER PIPE	1017	1017 & 1013
xx59.	MISCELLANEOUS YARD PIPING	1017	1017 & 1013
	INSTRUMENTATION - 60 ACCT.		
xx61.	MECHANICAL INSTRUMENTATION	1182	1172
xx62.	INSTRUMENT PIPING & TUBING	1017	1017 & 1013
xx63.	ELECTRICAL INSTRUMENTATION	1172	1172
xx68.	MISCELLANEOUS INSTRUMENTATION MATERIALS	1172	1172
	ELECTRICAL EQUIPMENT - 70 ACCT.		
xx71.	SWITCHGEAR & LOAD CENTERS	1175	1175
xx72.	TRANSFORMERS	1174	1174
xx73.	BUS DUCT	1017	1017 & 1013
xx74.	MOTOR CONTROL PANELS	1175	1175
xx75.	CONTAINMENT PENETRATIONS	1017	1017 & 1013
xx77.	OTHER ELECTRICAL EQUIPMENT	117	117
	ELECTRICAL BULK MATERIAL - 80 ACCT.		
xx81.	CABLE TRAY	1025	1025
xx82.	CONDUIT	1017	1017 & 1013
xx83.	GUTTER	1025	1025
xx84.	WIRE & CABLE	1026	1026
xx85.	TERMINATIONS	1025	1025
xx86.	LIGHTING FIXTURES, RECEPTACLES & SWITCHES	1083	1083
xx87.	MISCELLANEOUS ELECTRICAL BULK	1017	1017 & 1013

	DISTRIBUTABLES - 90 ACCT.	Company Indicated Producer Price Index General Code #	POC Utilized Producer Price Index General Code #
xx91.	TEMPORARY CONSTRUCTION FACILITIES	1079	1074
xx92.	MISCELLANEOUS CONSTRUCTION SERVICES	NA	*
xx93.	CONSTRUCTION EQUIPMENT	1121	1121
xx94.	OFFICE EQUIPMENT & SUPPLIES	122	122
xx95.	START-UP	NA	*
xx96.	PAYROLL EXPENSES	NA	*
xx97.	BACKCHARGES	NA	*
xx98.	INSURANCE & TAXES	NA	*
xx99.	EXTRA CONTRACTUAL FIELD COSTS	NA	*

* Index used reflects General Index - "Industrial Commodities"

LIMERICK UNIT 1 AND COMMON

MATERIAL AND SUBCONTRACT COSTS ASSOCIATES WITH NOT MEETING APRIL 1981 IN-SERVICE DATE

ACCOUNT	DESCRIPTION	UNIT 1	COMMON	TOTAL
10	Concrete	$ 149,780	$ 186,377	$ 336,157
20	Civil and Architectural	1,427,111	2,496,667	3,923,778
30	Nuclear Steam Supply System	164,245	-0-	164,245
40	Mechanical Equipment	7,020,855	3,339,404	10,360,259
50	Piping	2,745,479	1,163,112	3,908,591
60	Instrumentation	492,477	1,039,751	1,532,228
70	Electrical Equipment	280,008	244,761	524,769
80	Electrical Bulk Material	309,227	220,054	529,281
90	Distributables	6,285,665	2,755,366	9,041,031
TOTAL MATERIAL AND SUBCONTRACT COSTS DUE TO DELAY		$18,874,847	$11,445,492	$30,320,339
HOME OFFICE COSTS (EX. DPD-21)		23,109,499	10,846,490	33,955,989
TOTAL MATERIAL SUBCONTRACT AND HOME OFFICE COSTS		$41,984,346	$22,291,982	$64,276,328

DR-Staff-Construction-49

Rec'd 4/9/85

Q.DR-Staff-Construction-49. Please provide total project cost data as of 10/31/84 similar to pages 6 and 48 of Forecast 7.

A.DR-Staff-Construction-49. Attachments DR-Staff-Construction-49a provides the requested total plant direct cost summary as of 10/31/84. Attachment DR-Staff-Construction-49b provides the requested total plant material summary as of 10/31/84.

Rcd 4/9/85

Attachment DR-Staff-Construction-49a

Limerick Generating Station
Total Project
Direct Cost Summary
Cumulative Thru 10/31/84
Million $

Total - Unit 1 & C

ITEM	Million $
Manual	$ 645.5
Non-Manual	255.5
Engineering & OHO	406.6
Material	381.5 A
Subcontracts	340.5
Fee	2.0
Field S/U	26.7
Total Bechtel	$2,058.3
PECo	$ 576.0
Total Direct Cost	$2,634.3

Rec'd 4/7/85

Attachment DR-Staff-Construction-49b

EX. DPD-20C

Limerick Generating Station
Total Project
Materials
Cumulative Thru 10/31/84

Account	Item	Dollars
10	Concrete	$46,100,295
20	Civil	38,881,485
30	NSSS	684,244
40	Mech Equip.	39,376,963
50	Piping	89,623,652
60	Instrumentation	19,836,101
70	Elect. Equip.	8,193,804
80	Elect. Bulks	15,758,070
90	Distrib's	122,049,725
GP	Maint. Matl's.	246,226
	Adjustment	700,112
	Total Materials	$381,450,677

UNITIZATION OF HOME OFFICE COSTS INCURRED AFTER APRIL 1981 - AND CALCULATION OF THE COSTS OF THE DELAYS APPLICABLE TO THE INCREMENTAL COST AT OCTOBER 1984

	UNIT 1	COMMON	TOTAL UNIT 1 AND COMMON
Total Home Office Costs Incurred After April 1981	$216,891,623	$216,891,623	$216,891,623
Each Facility's Percentage Contribution to Total (see EX. DPD-21B)	57.1%	26.8%	83.9%
Each Facility's Dollar Contribution to the Total (lines 1 X 2)	$123,845,117	$ 58,126,955	$181,972,072
Calculated Ratio of Non Manual Costs of Delays to Total Non Manual Costs Incurred Subsequent to April 1981	18.66%	18.66%	18.66%
Each Facility's Cost of Delay Applicable to Home Office Costs	$ 23,109,499	$ 10,846,490	$ 33,955,989

DEVELOPMENT OF PERCENTAGES USED TO UNITIZE HOME OFFICE COSTS INCURRED SUBSEQUENT TO APRIL 1981 TO UNIT 1 AND COMMON PLANT

CALCULATION OF PERCENT APPLICABLE TO UNIT 1 AND COMMON

Total Home Office Costs for Unit 1 and Common at October 1984		$341,000,000
Total Project Home Office Costs at October 1984 per DR Construction 49	÷	406,600,000
Unit 1 and Common Facility's Contribution to Total		83.9%

CALCULATION OF UNIT 1 PERCENTAGE AND COMMON PERCENTAGE

	UNIT 1	COMMON	TOTAL UNIT 1 AND COMMON
Percent of Home Office Cost Allocated to Each Facility per June 1984 Unitized Cost Study	(A) 57%	(B) 26.7%	(C) 83.7%
Percent of Each Facility to the Total of the Two	(A)/(C) 68.1%	(B)/(C) 31.9%	100.0%
Percent of Home Office Costs for Unit 1 and Common at October 1984	83.9%	83.9%	83.9%
Implied Percent for Each Facility Based on Percent Shown in June 1984 Unitized Cost Study	57.1%	26.8%	83.9%

CATEGORIES USED TO ACCUMULATE PECO DIRECT COSTS FROM THE E&R REPORT

Sub-Division	Description
301	NSSS - G.E. Co (NSSS)
302	Turbine Generator - G.E. Co (NSSS)
303	Other Const. & Equip. Costs
304	Bechtel Construction & Fee (B-6)
305	Cancelled
306	Technical Support Center
307	Bradshaw Reservoir
308	Bradshaw To Perkiomen Pipeline
	Total
	PECO Construction Costs
316	Permanent Record Storage
317	Disposition & Salvage of Const. Mat'l & Equip.
318	230KV & 500 KV Main Transf. Buses
319	33KV Auxiliary Start-up Feeds
320	Construction Supervision
321	Construction Plant Expense
322	Construction Permit Mat
323	Construction Power Costs Station
324	Environmental Equip - Incl. Water Stdn.
328	Internal Auditing Costs
329	Quality Control - Const. Div.
330	Operational Support to Bechtel Corp
324	Elec. Field Inspection - PE Co

CATEGORIES USED TO ACCUMULATE PECO DIRECT COSTS FROM THE E&R REPORT

Sub-Division	Description
335	Laboratory Relay Testing
336	Systems Operations Office
338	66KV Xmo L&R Substation
339	Insurance
341	Office Furniture & Stores Equip
351	T.V. Complaints
352	Emerg Public Notification System
353	Plant Maint Labor Pre Comm
354	Maint Tools Supplies Pre Comm
356	Elect Product. Supv. & O&M
357	Security Service
389	Research & Testing Seed Purchases
	Total P.E. Construction
	Engineering Salaries & Expenses P.E. Co. Engineering
8131	Mechanical Engineering
8132	Electrical Eng (Inside Plant)
8133	Engineering Design
8134	System Planning
8135	Research
8136	Legal Services
8139	Mech Eng - Env Environmental

CATEGORIES USED TO ACCUMULATE PECO DIRECT COSTS FROM THE E&R REPORT

COLUMN WIDTH	Sub-Division	Description
1		
2		
3	8232	Cancelled
4		
5	8239	Engineering Soc Technical Support Costs
6		
7		Total PECO - Engineering
8		
9		
10		Training & Start-up
11		
12	8231	On-Site Training - Testing
13		
14	8232	Off-Site Training - Testing
15		
16	8233	On-Site Training, Readiness
17		
18	8234	Off-Site Training, Readiness
19		
20	8235	Start-up - Readiness
21		
22	8236	Cancelled
23		
24	8237	Limerick Computer Test Facility
25		
26		Total Training & Start-up
27		
28		
29		Consulting
30		
31	8235	Consulting Electrical
32		
33	8238	Consulting - General
34		
35	8236	Consulting Engineering, Planning
36		
37	8234	Consulting - Resident
38		
39	8237	Bechtel Test Program, Dynamic Testing
40		
41	8238	G.E. Technical Support
42		
43	8239	U.E. & C. Services
44		

UNITIZATION OF PECO DIRECT COSTS INCURRED
SUBSEQUENT TO APRIL 1981 APPLICABLE TO UNIT 1 AND COMMON PLANT
EXAMPLE BASED ON SUB-DIVISION 323 - CONSTRUCTION POWER COSTS

		Unit 1 Total	Common Total	Total Unit 1 & Common
Total Balance for Unit 1 and Common for Sub-Division 323 at Oct. 1984 (per Company)	(A)	$7,866,133	$3,710,665	$11,576,798
Each Facility's Contribution to the Combined Total		67.9%	32.1%	100%
Unit 1 and Common Balance at April 1981 (see Page 2)		$4,918,681	$4,918,681	$ 4,918,681
Each Facility's Contribution to the Total	(B)	$3,339,784	$1,578,897	$ 4,918,681
Cost Incurred by Facility Subsequent to April 1984	(A)-(B)	$4,526,349	$2,131,768	$ 6,658,117

CALCULATION OF PECO DIRECT INCURRED
SUBSEQUENT TO APRIL 1981 APPLICABLE TO UNIT 1/COMMON AND UNIT 2
EXAMPLE BASED ON SUB-DIVISION 323 - CONSTRUCTION POWER COSTS

		Unit 1 And Common Total	Unit 2 Total	Total Project
Unitization of Balance of Sub-Division 323 at Oct. 1984 (Per PECO)	(A)	$11,576,798	$ 1,917,989	$13,494,787
Each Facility's Contribution to Total		85.8%	14.2%	100%
Total Balance Sub-Division 323 of April 1981 - Per PECO E&R Report		$ 5,732,729	$ 5,732,729	$ 5,732,729
Each Facility's Contribution to Total Basedon 1984 Ratios	(B)	$ 4,918,681	$ 814,048	$ 7,762,058
Increased Costs by Facility	(A)-(B)	$ 6,658,117	$ 1,103,941	

Q.DR-Staff-Construction-57. With regard to the PECo expenditure categories shown on Table C-2 of Bimonthly Report #4, please indicate which subdivisions (shown on response DR-Staff-Construction-53) are associated with each category.

A.DR-Staff-Construction-57. The requested data is provided below.

PECo
Limerick Generating Station
Categorization of Workorder Subdivision
for Bi-Monthly Report

Item	Subdivisions
NSSS/TG	301, 302
Purchase Order	303, 357, 359, 8338, 8339
Bradshaw	306, 307, 308,
Insurance	339
Construction Supv.	305, 316, 317, 318, 319, 320, 321, 322, 328, 329, 330, 336, 338, 340, 341, 351
Power	323
Electrical Checkout	334
Instrument Checkout	325, 335
Public Notification	352
Engineering	8131, 8132, 8133, 8134, 8135, 8137, 8138, 8139, 8236, 8237, 8238, 8239, 8332, 8334, 8335, 8336, 8337
Legal	8136
Training	8231, 8232, 8233, 8234
Plant/Startup Staff	356, 8235
Maintenance	353, 354

O/C

PECO DIRECT COSTS
SUMMARY OF AMOUNTS ASSOCIATED WITH NOT MEETING IN-SERVICE DATE OF APRIL 1981

ITEM	COSTS ASSOCIATED WITH CONSTRUCTION DELAYS UNIT 1	COMMON	TOTAL
NSSS/TG	$ 5,356,295	$ -0-	$ 5,356,295
Purchase Orders	4,428,323	1,244,992	5,673,315
Bradshaw	-0-	387,080	387,080
Insurance	717,067	337,886	1,054,953
Construction Supervisor	783,294	348,689	1,131,983
Power	711,995	335,327	1,047,322
Electrical Checkout	1,004,822	477,588	1,482,410
Instrument Checkout	2,873,469	1,739,495	4,612,964
Public Notification	-0-	951,627	951,627
Engineering	5,642,124	3,142,853	8,784,977
Legal	257,048	141,602	398,650
Training	1,910,165	902,385	2,812,550
Plant/Startup Staff	2,802,595	1,334,542	4,137,137
Maintenance	214,088	111,506	325,594
Sub-Total	$26,701,285	$ 11,455,572	$ 38,156,857
Delete Bradshaw Per Supplemental Testimony of Thomas P. Hill	-0-	(387,080)	(387,080)
Total PECO Direct Costs Associated With Delays	$26,701,285	$ 11,068,492	$ 37,769,777

PHILADELPHIA ELECTRIC COMPANY

Bimonthly Report #4

To Pennsylvania Public Utility Commission

On Status of The Limerick Project

November 30, 1984

PHILADELPHIA ELECTRIC COMPANY
2301 MARKET STREET
P.O. BOX 8699
PHILADELPHIA, PA. 19101
(215) 841-5800

JOSEPH F. PAQUETTE, JR., VICE PRESIDENT
FINANCE AND ACCOUNTING DEPARTMENT

November 30, 1984

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

RE: Philadelphia Electric Company
Limerick Nuclear Generating Station
Investigation Docket I-80100341

Dear Mr. Rich:

In accordance with the Commission's Order of February 22, 1984 enclosed herewith is the Company's Fourth Bimonthly Report which includes actual expenditures on Limerick #1 and Common Plant through October 31, 1984.

As previously reported to the Commission by letter of October 30, 1984, the Company now estimates that the earliest possible date for commercial operation of Limerick Unit #1 is the third quarter of 1985 assuming an interim source of supplemental water is available by May 1985.

Assuming that commercial operation begins on August 1, 1985, the completed cost estimate for Limerick #1 and Common Plant would be $3,848 million which is an increase of $143 million from the estimate in the last Bimonthly Report. This increase is due primarily to a change in the estimated commercial operation date from April 1985 to the third quarter of 1985 which will result in additional financing costs and start-up expenses being capitalized. The details of the revised cost estimate are shown in Section IV Table C-2.

A copy of this report has been provided to the Office of Consumer Advocate.

Sincerely,

J. F. Paquette

11/30/84

LIMERICK UNIT 1 & COMMON
COST MILESTONES
FORECAST VS ACTUAL EXPENDITURES
(MILLIONS)

	TO-DATE 9/1/84	TO-DATE 9/1/84	SEPT - OCT ****		NOV - DEC ****		JAN - FEB ****		MAR - APR ****		MAY - JULY ****		AUG '85 - ON ****		TOTAL	TO-DATE TOTAL
	FORECAST	ACTUAL	FCST	ACT	FCST	ACT	FCST	ACT	FCST	ACT	FCST	ACT	FCST	ACT	FCST ***	ACT
BECHTEL EXP																
Manual	$554.9	$563.6	$2.5	$8.4	$2.9		$1.4		$1.6		$2.7				$580.6	$572.0
Non Manual Labor	$226.3	$225.1	$3.6	$6.5	$6.1		$5.0		$4.4		$3.0				$250.1	$231.6
Subcontracts	$283.9	$266.4	$3.5	$7.5	$4.0		$4.4		$3.3		$0.2				$285.8	$273.9
Material	$292.4	$295.7	$1.2	$5.0	$1.9		$0.5		$0.6		$0.5				$304.2	$300.7
SFHO	$332.3	$333.7	$5.7	$7.3	$3.9		$1.4		$0.7		$0.4				$347.4	$341.0
Startup	$25.1	$24.2	$2.4	$2.6	$2.0		$1.3		$0.9		$0.7				$31.7	$26.8
SUBTOTAL	$1,714.9	$1,708.7	$18.9	$37.3	$20.8		$14.0		$11.5		$7.5				$1,799.8	$1,746.0
PECO EXP																
NSSS/TG	$128.0	$124.8	$1.9	$1.6	$1.6		($0.6)		($1.3)		$0.9				$127.0	$126.4
Purchase Orders	$61.6	$64.3	$2.0	$4.9	$1.6		$1.2		$1.1		$1.5				$74.6	$69.2
Bradshaw	$5.1	$4.0	$2.2	-	$2.4		$2.1		$0.5		$1.1				$10.1	$4.0
Insurance	$21.5	$21.9	$0.7	$0.4	$0.6		$0.7		$0.7		$1.0				$25.3	$22.3
Const. Supv.	$15.1	$14.9	$0.5	$0.2	$0.7		$0.7		$0.6		$0.8				$17.9	$15.1
Power	$12.2	$11.8	$0.5	$0.2	$0.6		$0.6		$0.4		$0.6				$14.2	$12.0
Electrical Checkout	$8.8	$8.5	$0.8	$0.5	$0.3		$0.3		$0.3		$0.9				$10.8	$9.0
Instrument Checkout	$22.8	$21.7	$2.8	$3.8	$2.3		$2.0		$1.7		$2.1				$33.6	$25.5
Public Notification	$3.4	$4.5	-	$0.3	-		-		-		-				$4.8	$4.8
Engineering	$72.4	$74.1	$1.8	$3.0	$2.0		$1.8		$1.6		$2.4				$84.9	$77.1
Legal	$2.4	$2.2	$0.1	$0.3	$0.1		$0.2		$0.1		$0.1				$3.0	$2.3
Training	$14.1	$15.2	$0.2	$0.6	$0.4		$0.3		$0.3		$0.3				$17.1	$15.8
Plant/Startup Staff	$19.4	$19.8	$2.3	$2.9	$2.8		$2.8		$2.6		$3.6				$34.5	$22.7
Maintenance	$1.1	$1.3	$1.1	$1.1	$1.1		$1.2		$1.2		$1.8				$7.7	$2.4
Pre-Commercial Credit	-	$0.0	-	-	-		($5.0)		($13.0)		($22.0)				($40.0)	$0.0
SUBTOTAL	$387.9	$389.0	$16.9	$19.8	$16.5		$8.3		($3.2)		($4.9)		$0.0		$425.5	$408.8
TOTAL DIRECTS	$2,102.8	$2,097.7	$35.8	$57.1	$37.3		$22.3		$8.3		$2.6		$0.0		$2,225.3	$2,154.8
Contingency	$10.0		$10.0	-	$0.4		-		-		-				$0.4	$0.0
AFUDC	$933.4	$932.5	$47.9	$47.2	$48.2		$51.6		$51.9		$107.5 *		$347.4 **		$1,586.3	$979.7
Overheads	$5.0	$5.1	$0.1	$0.2	$0.1		-		-		-		-		$5.4	$5.3
Taxes	$30.5	$30.5	-	-	-		-		-		-		-		$30.5	$30.5
TOTAL	$3,081.7	$3,065.8	$93.8	$104.5	$86.0		$73.9		$60.2		$110.1		$347.4		$3,847.9	$3,170.3

* Includes AFUDC on Unit 1 & C thru Unit 1 C.O. in August 1985

** AFUDC on 50% of Common Plant Expenditures thru Unit II C.O. in July 1990

*** Total forecasted cost equals actual cost thru October, 1984 plus forecasted cost after November 1, 1984

**** Revised to reflect new schedule

TABLE C-2

Q.DR-Staff-Construction-58. Please provide the actual expenditures for Unit #1 and Common, separately, as of April 30, 1981. If this monthly breakdown is not available, please provide the year end balances as of December 31, 1980 and December 31, 1981.

A.DR-Staff-Construction-58. As stated in response DR-Staff-Construction -55, historically, actual charges to the Limerick Project have only been maintained on a total project basis. Recently these actual costs were separated into two categories: 1) Limerick Unit #1 and Common and 2) Limerick Unit #2. Consequently, the requested actual balances as of April 30, 1981 are not available. Provided below is an estimate of the costs associated with Unit #1 and Common as of December 31, 1980 and December 31, 1981.

Million ($)

	Unit #1		Common	
	12/30/80	12/31/81	12/30/80	12/31/81
Direct Costs	$615.2	$ 748.3	$232.0	$318.6
Taxes & Ovhds.	16.9	21.4	6.4	9.3
AFUDC	205.0	279.7	89.3	124.3
Total	$837.1	$1049.4	$327.7	$452.2
% Direct Costs	72.6%	70.1%	27.4%	29.9%

1+Common 12/80 $547.2
projected → 4/81 920.4
12/81 1,066.9

DETERMINATION OF THE COST ASSOCIATED WITH NOT MEETING AN APRIL 1981 IN-SERVICE DATE FOR AFUDC

	UNIT 1 TOTAL	COMMON TOTAL	TOTAL UNIT 1 AND COMMON
Actual AFUDC Claimed in PECO Rate Filing (EX. DPD-30)	$971,200,000	$454,000,000	$1,425,200,000
Amount of AFUDC That Would Have Been Accrued if Plant was Completed in April, 1981 (see EX. DPD-28B)	345,483,657	152,763,712	498,247,36
Cost of Delay Applicable to AFUDC	$625,716,343	$301,236,288	$ 926,952,63

DETERMINATION OF AMOUNT OF AFUDC THAT WOULD HAVE BEEN ACCRUED IF UNIT 1 AND COMMON PLANT WERE COMPLETED IN APRIL, 1981

	UNIT 1 TOTAL	COMMON TOTAL	TOTAL UNIT 1 AND COMMON
Actual AFUDC Accrued by PECO Through April 1981	$228,800,000	$ 98,700,000	$327,500,000
Incremental AFUDC on Reasonable Post April 1981 Costs (see EX. DPD-28C)	116,683,657	54,063,712	170,747,369
Amount of AFUDC That Would Have Been Accrued if Plant was Completed in April, 1981	$345,483,657	$152,763,712	$498,247,369

CALCULATION OF INCREMENTAL AFUDC ON POST APRIL 1981 COSTS - UNIT 1

TIME PERIOD	ASSUMED MONTHLY EXPENSE	NO. OF MONTHS	TOTAL CONSTRUCT. COSTS	PRIOR PER. CONST. COSTS	COMPOUND INTEREST	TOTAL INTEREST BASE	APPLICABLE INTEREST RATE	TIME FACTOR	INCREMENT AFUDC CALC.
11/1/77 THRU 12/30/77	16716687	2	33433374	$0	$0	$33,433,374	0.087	0.166666666667	$484,784
1/1/78 THRU 6/30/78	16716687	6	100300122	$33,433,374	$484,784	$134,218,280	0.071	0.5	$4,764,749
7/1/78 THRU 12/30/78	16716687	6	100300122	$134,218,280	$4,764,749	$239,283,151	0.073	0.5	$8,733,835
1/1/79 THRU 6/30/79	16716687	6	100300122	$239,283,151	$8,733,835	$348,317,108	0.074	0.5	$12,887,733
7/1/79 THRU 12/30/79	16716687	6	100300122	$348,317,108	$12,887,733	$461,504,963	0.075	0.5	$17,306,436
1/1/80 THRU 6/30/80	16716687	6	100300122	$461,504,963	$17,306,436	$579,111,521	0.075	0.5	$21,716,682
7/1/80 THRU 12/30/80	16716687	6	100300122	$579,111,521	$21,716,682	$701,128,325	0.082	0.5	$28,746,261
1/1/81 THRU 4/30/81	16716687	4	66866748	$701,128,325	$28,746,261	$796,741,334	0.083	0.333333333333	$22,043,177
		42	702100854	$2,496,996,721	$94,640,480	$3,293,738,056			$116,683,657

CALCULATION OF INCREMENTAL AFUDC ON POST-APRIL 1981 COSTS - COMMON PLANT

TIME PERIOD	ASSUMED MONTHLY EXPENSE	NO. OF MONTHS	TOTAL CONSTRUCT. COSTS	PRIOR PER. CONST. COSTS	COMPOUND INTEREST	TOTAL INTEREST BASE	APPLICABLE INTEREST RATE	TIME FACTOR	INCREMENT AFUDC CALC.
11/1/77 THRU 12/30/77	7745439	2	15490878	$0	$0	$15,490,878	0.087	0.166666666667	$224,618
1/1/78 THRU 6/30/78	7745439	6	46472634	$15,490,878	$224,618	$62,188,130	0.071	0.5	$2,207,679
7/1/78 THRU 12/30/78	7745439	6	46472634	$62,188,130	$2,207,679	$110,868,442	0.073	0.5	$4,046,698
1/1/79 THRU 6/30/79	7745439	6	46472634	$110,868,442	$4,046,698	$161,387,774	0.074	0.5	$5,971,348
7/1/79 THRU 12/30/79	7745439	6	46472634	$161,387,774	$5,971,348	$213,831,756	0.075	0.5	$8,018,691
1/1/80 THRU 6/30/80	7745439	6	46472634	$213,831,756	$8,018,691	$268,323,081	0.075	0.5	$10,062,116
7/1/80 THRU 12/30/80	7745439	6	46472634	$268,323,081	$10,062,116	$324,857,831	0.082	0.5	$13,319,171
1/1/81 THRU 4/30/81	7745439	4	30981756	$324,857,831	$13,319,171	$369,158,758	0.083	0.333333333333	$10,213,392
		42	325308438	$1,156,947,892	$43,850,320	$1,526,106,650			$54,063,712

DETERMINATION OF POST APRIL 1981 REASONABLE COST APPLICABLE TO UNIT 1 AND COMMON PLANT

	UNIT 1 TOTAL	COMMON TOTAL	TOTAL UNIT 1 AND COMMON
Actual Cost Incurred Subsequent to April 1981	$833,814,561	$386,329,911	$1,220,144,472
Less Calculated Cost of Delays	131,713,712	61,021,478	192,735,190
Reasonable Post-April 1981 Costs	$702,100,849	$325,308,433	$1,027,409,282
Number of Months (May, 1981 Through October, 1984)	42	42	42
Assumed Monthly Expenditures Needed to Complete Unit 1 and Common Plant by April 1981	$ 16,716,687	$ 7,745,439	$ 24,462,126

Q.DR-Staff-Construction-60. Attached is a calculation of AFUDC on hypothetical construction project. The basic assumptions are:

1. Project construction period was 48 mos. 4/1/81 thru 12/31/84
2. Total Net Cost of Construction (excluding AFUDC) was $4,800,000.
3. The $4,800,000 of Total Cost was expended evenly over the 48 month period (100,000/mo)

Question: Would the $1,117,799 of AFUDC calculated on the attached worksheet be approximately the same as the actual amount that would have been calculated by PECo during construction?

A.DR-Staff-Construction-60. Based upon the assumptions presented, the indicated AFUDC would not represent the amount of AFUDC that PECo would calculate. The assumptions indicate that the construction expenditures were made uniformly over the construction period (48 months). However, the AFUDC calculation presented indicates that the semi-annual construction expenditures were all made the first day of the period. This approach maximizes the amount of AFUDC calculated in a given period and, consequently, overstates the amount of AFUDC applicable to the project.

OK

Q.DR-Staff-LIM-14. Refer to page 27 of PECo Statement 1. Provide a comprehensive breakdown of direct and AFDC dollars for common plant. The plant shall be classified into the four categories described on pages 27 and 28 and further broken down into the subcategories listed therein.

A.DR-Staff-LIM-14. A comprehensive breakdown of direct and AFUDC dollars for the four categories and subcategories of Common plant listed on pages 27 and 28 of PECo Statement 1 is not available. However, the direct costs and AFUDC, overheads and taxes in total for the second and fourth categories of common plant are shown on page 29 of PECo Statement 1.

A comprehensive breakdown of direct costs, overheads and taxes and AFUDC for all of common plant is contained in Attachment DR-Staff-LIM-14.

Responsible Witness: V.S. Boyer, Sr.Vice President-Nuclear Power

Limerick 1 and Common Annual Expenditures 1971-1986
Service Date February 15, 1986
Millions of Dollars

	#1 Unit				Common Plant			
	Direct Costs	Taxes & O.H.	AFUDC	Total	Direct Costs	Taxes & O.H.	AFUDC	Total
1971	$21.8	-	$1.1	$22.9	$9.4	-	$0.4	$9.8
1972	23.2	-	2.8	26.0	10.7	-	1.1	11.8
1973	43.8	$0.2	5.0	49.0	12.2	-	1.8	14.0
1974	50.3	0.4	8.0	58.7	21.0	$0.2	3.3	24.5
1975	57.1	1.0	13.5	71.6	23.6	0.5	5.5	29.6
1976	75.6	1.8	18.1	95.5	29.1	0.7	8.2	38.0
1977	78.8	2.4	24.1	105.3	34.8	0.9	11.2	46.9
1978	58.9	3.1	32.9	94.9	30.8	1.2	14.5	46.5
1979	81.1	3.8	42.4	127.3	23.8	1.3	18.8	43.9
1980	124.6	4.2	57.1	185.9	36.6	1.6	24.5	62.7
1981	133.1	4.5	74.7	212.3	86.6	2.9	35.0	124.5
1982	196.5	2.1	106.1	304.7	125.8	1.3	47.3	174.4
1983	264.2	0.4	138.7	403.3	134.9	0.2	64.9	200.0
1984	250.3	0.7	180.0	431.0	157.3	0.4	86.9	244.6
1985(est)	82.0	0.2	216.9	299.1	67.4	0.1	106.8	174.3
1986(est)	3.3	-	49.8	53.1	9.4	-	24.9	34.3
Total	$1544.6	$24.8	$971.2	$2540.6	$813.4	$11.3	$455.0	$1279.8

SM 2-6-86
Phila
R-850152

PECO EXHIBIT NO. 4

IR-PECO-III-1

Q. Reference p. 1, l. 17-19. Provide the basis for the use of the April 1981 in-service date. Provide workpapers, reports, studies and other documents relied upon by Mr. Dougherty in reaching the conclusions that Limerick Unit No. 1 should have and could have entered service on April 4, 1981.

A. As stated in Mr. Dougherty's pre-filed statement, it is not his conclusion that Limerick Unit 1 should have and could have entered service in April 1981.

The basis for use of the April 1981 in-service date is the fact, stated in the Commission's order at I-80100341, that the anticipated in-service date for Limerick Unit 1 at the time the company announced the 1976 delay was April 1981. That delay, as well as the subsequent 1978 delay, was found by the Commission to have been imprudent. As no specific day was referenced in the Commission's order, Mr. Dougherty assumed an in-service date of April 30, 1981.

Witness: D. P. Dougherty

IR-PECO-III-2

Q. Provide specific page references to the Commission decision which are the basis for the statement at p. 2, l. 4-7.

A. 56 PaPUC at p. 56 for the in-service date; 56 PaPUC at p. 61 for the determination that the 1976 and 1978 construction delays had been imprudent.

Witness: D. P. Dougherty

Q. Reference p. 3, l. 20-23. If the Commission determines in this proceeding that an in-service date other than April 4, 1981 should be used for Limerick Unit No. 1, will the Staff "present to the Commission a reasonable approximation of the costs associated with not meeting" that new in-service date determined by the Commission? If so, describe the methodology staff will use to prepare that cost approximation. Will that methodology be a replication of the calculations described by Mr. Dougherty or will it involve proportioning, rationing, or some other adjustment to the cost calculations presented by Mr. Dougherty in Statement DPD-1?

A. There will be no opportunity to present additional testimony after the Commission's determination in this proceeding is issued.

Witness: D. P. Dougherty

IR-PECO-III-4.

Q. Reference p. 3, l. 24-25. Provide specific page and line references describing where "the I-8010024 Order specifically mentions an in-service date of April 1981."

A. It should be noted docket number is I-80100341, not the I-8010024 referenced in the interrogatory or the I-8010034 erroneously contained in Mr. Dougherty's testimony. See the response to IR-PECO-III-2.

Witness: D. P. Dougherty

IR-PECO-III-5

Q. Reference p. 4, l. 13-15. What are the date(s) of the "most currently available data" used in Staff's calculation of delay costs presented in Staff Statement DPD-1? If more recent data becomes available, does Staff propose to revise or update its delay cost calculations presented in this Statement?

A. The data used in Mr. Dougherty's analysis were the project-to-date expenditures as of the end of October 1984.

Staff does not intend to revise or update the calculations presented in Staff Stmt. DPD-1.

Witness: D. P. Dougherty

Q. Were all costs shown on Exhibit DPD-25 calculated in the same manner as construction supervision (i.e. use of the 19.73% non-manual factor); if not, what method was used for each individual line item?

A. No. Attachment IR-PECO-V-4 is a copy of Ex. DPD-25 with the factors used by Staff to calculate the amount of PECO direct costs associated with not meeting the April 1981 in-service date. Lines 1 through 10 on page 21 of Staff Statement DPD No. 1, show the derivation of the 19.73%. The 15.73% was developed in a manner identical to the 19.73% except that in addition to non-manual labor costs, the costs of manual labor, materials, subcontracts and home office costs were considered:

Staff calculated cost of delays	$154,965,413
Post April 1981 Cost of Bechtel Labor, Material, Subcontract and Home Office	$1,006,968,333
=Per Cent of Total	15.39%

It should be noted that when applying the factor, Staff made a minor error which resulted in the application of 15.73 rather than the 15.39%. The remaining factor of 9.5% was developed as follows:

Material and Subcontract Costs

Staff calculated cost of delays	$ 30,320,339
Post April 1981 Cost of Bechtel Material and Subcontract	$320,654,085
=Per Cent of Total	9.5%

Witness: D. P. Dougherty

PECO DIRECT COSTS
SUMMARY OF AMOUNTS ASSOCIATED WITH NOT MEETING IN-SERVICE DATE OF APRIL 1981

ITEM		COSTS ASSOCIATED WITH CONSTRUCTION DELAYS UNIT 1	COMMON	TOTAL
NSSS/TG	15,73	$ 5,356,295	$ -0-	$ 5,356,295
Purchase Orders	15,73	4,428,323	1,244,992	5,673,315
Bradshaw	9,5	-0-	387,080	387,080
Insurance	9,5	717,067	337,886	1,054,953
Construction Supervisor	19,73	783,294	348,689	1,131,983
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