BEFORE

THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

- - - - -

In re: R-822169 - Pennsylvania Power & Light Company. Investigation into a requested $315 million dollar annual rate increase. Hearing.

- - - - -

Harrisburg, Pennsylvania

March 2, 1983

- - - - -

Pages 1307 to 1493, inclusive

- - - - -

HOLBERT ASSOCIATES
EUGENE W. HOLBERT
1001 North Second Street
Harrisburg, Pennsylvania 17102

BEFORE
THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

- - - - -

In re: R-822169 - Pennsylvania Power & Light Company.
Investigation into a requested $315 million dollar annual rate increase. Hearing.

- - - - -

Verbatim report of hearing held in Hearing Room 2, North Office Building, Harrisburg, Pennsylvania,

Wednesday,
March 2, 1983
at 9:30 a.m.

BEFORE

JOSEPH J. KLOVEKORN, ADMINISTRATIVE LAW JUDGE

- - - - -

APPEARANCES:

FRANK B. WILMARTH, ESQUIRE
JOHN M. QUAIN, ESQUIRE
P. O. Box 3265
Harrisburg, Pennsylvania 17120
Appearing on behalf of PUC Prosecutory Staff

ROBERT H. YOUNG, ESQUIRE
THOMAS P. GADSDEN, ESQUIRE
MORGAN, LEWIS & BOCKIUS
123 South Broad Street
Philadelphia, Pennsylvania 19109
AND
G. D. CALIENDO, ESQUIRE
PAUL E. RUSSELL, ESQUIRE
Two North Ninth Street
Allentown, Pennsylvania 18101
Appearing on behalf of Pennsylvania Power & Light Company, Respondent

APPEARANCES: (Continued)

PHILIP MCCLELLAND, ESQUIRE
DAVID BARASCH, ESQUIRE
IRWIN POPOWSKY, ESQUIRE
1425 Strawberry Square
Harrisburg, Pennsylvania 17120
Appearing on behalf of Office of Consumer Advocate

DAVID MANN
P. O. Box 249
Lewisburg, Pennsylvania 17837
Appearing on behalf of Susquehanna Alliance

NORMA J. ROSNER, ESQUIRE
Pillsbury, Madison & Sutro
1050 17th Street, N. W.
Washington, D. C. 20036
Appearing on behalf of Pennsylvania Industrial Coalition

INDEX TO WITNESSES

INDEX TO EXHIBITS

JUDGE KLOVEKORN: Let's begin. I call to order this hearing in the matter of R-822169, Pennsylvania Public Utility Commission versus Pennsylvania Power and Light Company. Do we have any preliminary matters before we begin with Mr. Hecht?

MR. YOUNG: Your Honor, I distributed, at the end of yesterday's hearing a supplemental direct testimony of George F. Vanderslice, and consistent with our previous procedures, I would certify that if Mr. Vanderslice were here, this is how he would testify and we would move that this be admitted in evidence at this time subject to the establishment of an appropriate date for cross examination of Mr. Vanderslice.

MR. WILMARTH: Your Honor, as I indicated at the close of hearing yesterday, we have a problem even permitting it in for purposes of identification at this point. I am sure you are aware of the underlying circumstances in the company's petition for Declaratory Order which was filed June 10?

MR. CALIENDO: It was filed May 13.

MR. WILMARTH: Of what year?

MR. CALIENDO: Of '82.

MR. WILMARTH: And the Commission's responsive opinion and order adopted July 2 of --

MR. BARASCH: 29.

MR. CALIENDO: It was adopted the 21st. It was entered the 29th.

MR. WILMARTH: That's relatively immaterial. It's staff's position that the Declaratory Order speaks for itself and notwithstanding requests that were made in the company's petition for Declaratory Order, that the Declaratory Order was expressly procedural only and only permits the company to, among other things, implement the deferral of system of accounting for handling operating maintenance expenses, depreciation and associated capital costs involving the Susquehanna Plant assuming the plant is to be commercialized sometime before the expiration or suspension date in this proceeding.

In other words, that window between the date of commercialization and August 22, when base rates would recognize the costs of operating Susquehanna. We feel that the Commission's order is, as I said, definitive that throughout the order, the references to deferral of costs and subsequent recognition, subsequent consideration of those costs necessarily implies that we can't be deferring any costs until they have actually been incurred.

Staff's position is that essentially, we oppose any premature attempt to dispose of the concepts involved or the questions as to what should be done with the energy savings or any deferred costs until they actually have been recorded

on the books of the company.

We are willing to, Your Honor, at this time, go through the order and point to those specific sections we feel are applicable.

Now, I might add as an aside before OCA addresses this action and we have discussed with the company the problem. At that time, there was at least some thinking that we might approach you together requesting certification of this issue directly to the Commission inasmuch as it does appear to be a matter of interpreting the Commission's Declaratory Order and I think regardless of your decision on it, either one party or the other would be attempting certification through you.

I believe Mr. Barasch would like to speak on this matter for the OCA also, Your Honor.

JUDGE KLOVEKORN: Mr. Barasch.

MR. BARASCH: Before I make any statements, I have a question about this filing that I would like to direct to the company and after getting that answer I would make whatever statement I have to make.

My question is leaving the question of Declaratory Order aside, under what provision or section of the Public Utility Code is this revised filing being made. Is it made under the General Rate Increase Section of the Code or under the Automatic Adjustments Section?

I looked through the Code last evening and I don't see where this revised filing fits within the parameters of the Public Utility Code. That's before I get into further discussion of the merits of this matter.

MR. YOUNG: It seems to me the answer to that is quite simple and that is it fits within the ambit of the Declaratory Order that the Commission issued.

Indeed the whole purpose for the company's petition for that Declaratory Order was to take care of the situation where the plant comes on line before this case ends. And under ordinary circumstances, the company would lose the AFUDC on that plant, at that moment, would begin to accrue all the expenses that the plant incurred and would, at the same time, have no revenue relief related to that plant.

And so one of the two purposes of the whole petition to the Commission was to set up a procedure to take care of those circumstances. The Commission's order very clearly provides that the company can establish a deferred process of accounting for these and that as soon as the service date of the plant is known, it specifically provides that the company shall let the ALJ and the Commission and parties to the proceeding know and that the deferred costs can then be collected in a proceeding that deals with that.

This particular -- and indeed, Mr. Vanderslice, in his opening testimony in this case, made very clear that this

was part of the company's contention in this proceeding that they have had a right to collect at some stage those deferred costs, and we thought that the provisions for their collection should be provided for in this proceeding.

As a matter of simply intelligent administrative operation, every issue that could possibly be involved in the analysis of those deferred costs is an issue in this case, with the possible exception of the period over which the deferred charges are collected.

The operating and maintenance expenses of the plant are at issue in this case and will be resolved. Presumably, the used and useful character of the plant and its cost will be resolved, applicable depreciation will be resolved.

Rate of return on the plant will be resolved and therefore, all of the numbers that one would use in order to fix the deferral are decided as a part of this necessary part of this proceeding. So that not deciding the case at the same time, over what period those deferrals should be collected would be certainly contrary to the whole intention of the parties in the filing for the Declaratory Order and contrary, it seems to us, to the Commission's intent when it issued that order.

MR. BARASCH: I believe Mr. Young's comment goes beyond the scope of cross but I would like to return to my initial comments. I would agree with Mr. Young that the

Declaratory Order did provide for the setting up of the deferred account.

But I think several points throughout the Declaratory Order make it clear that they were only setting up a procedure, a place where they could identify dollars but specifically, referring you to page 5, the propriety of recovery of the costs, the proper amortization and the reasonableness of any deferred costs that the company may collect -- I am paraphrasing -- were to be considered in the rate case in which the company sought recognition thereof. That's the middle paragraph, second paragraph on page 5.

It is Consumer Advocate's position, Your Honor, that this is not that rate case. If the company wished to make this claim in this rate case, there should have been notice in the claim in the initial filing material.

The company sought an increase of some $400 million in base rates in their initial filing, excuse me, $315 million in base rates to be offset by various -- excuse me. Let me start all over again.

There is an increase of non-energy based costs around $500 million reflected in the filing to be offset by some 186 of energy savings that they see associated with the coming on line of the Susquehanna unit. The public was on notice of the elements of that claim.

This, in effect, by simply not asking for the recovery

of those costs at the conclusion of this rate case, they are seeking to turn it in this case, if the numbers fall out, a $315 million base rate increase into a 335 base rate increase, assuming approximately $20 million annual amortization deferral.

The first question I have is that we didn't get notice of the matter and the company could have filed an estimated claim for this amount as they did through everything else in the future test year in this case and then the matter might properly have been before us.

I would point out that in a recent PECO rate filing where a similar attempt is being made, the company in PECO put the estimated filing into the claim. The company here, I believe in a desire to hold the magnitude of this rate increase as low as possible in terms of public relations, held the rate increase at 315.

Now, we find out it's not 315. It's 315 maximum exposure at the end of the rate case or when Susquehanna comes on line plus another pile of money that may be coming in as a result of an amortization, plus, if theory allows, any number of other claims, all of which could be added into this rate case as long as the effective date of those claims doesn't coincide with the end of the suspension period of this rate case.

The Commission had an opportunity to look at a similar

procedure in the GPU litigation that was concluded by settlement in January of last year and there, the company gave notice of the multi-stage nature of their filing, at least told us what our exposure was going to be at various points during the case.

There, while the Commission didn't address the matter in the rate case subject to settlement. Within a week after the settlement, the Commission issued a policy indicating their displeasure with the use of multi-stage rate filings.

It appears PP&L is attempting a multi-stage that becomes more apparent since we didn't give notice to the customer than the one in the GPU case where there was notice to the customer. I don't understand what the limits of such an approach would be.

It would seem to me there would be nothing stopping the company from turning this $315 million case into a four or five or $600 million case. So long as each further claim falls further outside the end of the test year.

As long as they are not collecting that much after the rate case. I don't think that's what the PUC had in mind in the reforms of 1976. If there had been notice given at the front end of the rate case and that the amount claimed was in no circumstance greater than the $315 million base rate increase that the company is seeking.

But in this situation it would appear to me the

deferral can continue and at some point in the future, in a subsequent rate case, the question of the propriety, correct amortization period and the correctness of the cost could be considered, either in a non-general rate filing made sometime after the rate case is over or in a subsequent rate case filed by the company.

But I don't think this is what was envisioned by the Declaratory Order. We have a lot of discussion about whether that Declaratory Order was purely an accounting recognition or whether it had some substantive significance and the Commission clearly indicated that that Declaratory Order was to have no substantive significance.

Now we are saying we can write in, these deferrals could have just as easily been 200 million as they could have been seventy-eight. That would suggest we could have $200 million more worth of issues to litigate in this rate case.

I am sure I probably have other things to say but I will hold my initial comments to that.

MR. YOUNG: It seems to me counsel is ignoring a number of obvious facts. In the first place on pages 31, 32 and 33 of Mr. Vanderslice's direct testimony he very clearly says we are seeking recognition of such deferrals in this proceeding.

He goes on to attach a schedule which gives the

parameters of those claims to the extent, on the basis of a May 15 operational date for the plant. Obviously unlike the PECO situation or any other at the time of filing, the company did not know precisely what day this plant would come on line, indeed doesn't know precisely at this moment, and therefore, the matter had to be expressed in terms of various alternatives, but we are trying, in this case, all of those issues.

Nobody else is making any claim for special costs. The issue in this case is what are the operating and maintenance costs of Susquehanna and those costs, for whatever period of time the thing is on line, will be a piece of what has to be amortized.

The same thing is true of the return. The same thing is true of the rate base. Of the depreciation. It's absolutely not so to say that some sort of open ended sesame has been created here where people can make all kinds of wild claims, only claims that are part and parcel of this case.

To defer all of this to a later time would cause us to have a wholly separate rate proceeding duplicating all of the issues of this case and adding only one additional issue, namely whether or not the costs that were created by the procedures settled in this case should be amortized over five years or some other period and there's absolutely no

sense to that.

MR. BARASCH: Your Honor, I think there is much more at stake here than the question of what the amortization period should be for these deferred costs. Nothing in the Declaratory Order indicates that the Commission is committing itself to any recovery of these costs.

MR. YOUNG: They are not committing themselves. They said the Declaratory Order is not a binding figure in this case.

MR. BARASCH: I am perfectly happy that Mr. Young responded. I would like to make my point and then he can respond at another time. For him to indicate the lack of decision, I fail to see the relevancy to this claim and all the estimated claims in the test year.

The company could have given to the public that there was more than $315 million at stake here and they didn't. The fact that it's buried in Mr. Vanderslice's testimony is not the same as giving notice to the public that the rate increase was, in fact not the $315 million.

Now we are finding out in fact the company is seeking more than $315 million in this rate proceeding and the only way they have gotten around the problem that they could not seek more than they asked for is by deferring the collection of it until this April 1 date of the energy clause.

There's no necessary connection between these deferred

costs and the energy clause and God knows what may be claimed in this rate proceeding and I don't see why there couldn't have been an estimate made so that we would have known from the beginning what the issues were in dispute and secondly, that it is not a mere question of the amortization rate involved here.

It's a question of how much of these costs should be collected. Whether the costs could be collected under the Public Utility Code. The Commission made very clear in their order, and the clarification to their order when we pressed the point about the late window aspect, that they were not disposing in any fashion of anything of substance.

MR. CALIENDO: The only thing they indicated in that late window clarification is with regard to used and useful argument. That's the only thing issued in the clarification order.

MR. YOUNG: All of those issues are issues in this case.

MR. BARASCH: They indicated they were not disposing of matters of substance.

MR. YOUNG: They weren't in that order, but they are in this order. The whole purpose of this case is to dispose of this.

MR. BARASCH: To seek recognition. The company has not sought recognition in their initial filing of this rate case

and they can't do it now.

MR. MANN: For what it's worth, I will put in my two cents. I was aware of the Declaratory Order at the time it came out. I read it. It was my impression that the company had asked for specific treatment of the deferred costs in addition to be allowed to defer those costs that the Commission specifically denied any treatment of those costs, as and when the rate case was filed.

As a member of the public, I saw no notice in any of the public notices given that this case was going to involve any more than $315 million.

JUDGE KLOVEKORN: Okay, as I understand it, we have a motion by Mr. Young to move into the record the supplemental direct testimony of Mr. Vanderslice. And objections have been raised by several of the parties. Right now the only issue before us is whether or not this should be received into evidence.

We are not discussing the merits raised by Mr. Vanderslice's testimony and I will overrule the objections and permit Statement Number 18 to be received into evidence. Proceed.

MR. BARASCH: Your Honor, would you note an exception for the record.

JUDGE KLOVEKORN: Exception is noted. Do we have any other preliminary matters?

MR. WILMARTH: Your Honor, I think it is important that we not just push this under the carpet for the moment. I think that if it's going to have to reach the Commission for them to decide what they meant by their order, or for them to decide that they'd like to revise what they meant by their order, it ought to happen as soon as possible.

MR. YOUNG: They can decide that when they decide the final decision in the case. That's what they propose to do.

MR. WILMARTH: I don't find that acceptable, Your Honor. I feel that inasmuch as there is pending here a significant issue, that we ought to have it certified to the Commission and I am -- I guess I need to make that motion to you or we need to make that jointly if the company is willing to do that.

JUDGE KLOVEKORN: The Code provides for certification of questions. I would suggest you follow the procedures set forth in the Code.

MR. WILMARTH: Thank you, Your Honor.

JUDGE KLOVEKORN: Do we have a date set for the cross examination of Mr. Vanderslice?

MR. YOUNG: We might as well fix one.

MR. YOUNG: I would be happy to work him in on the 16th or 15th. I guess that's a date set for us to cross examine some of the non-Susquehanna parties, but while he's not available the 17th or 18th, he could be here either the

15th or the 16th.

MR. POPOWSKY: Could we go off the record for a moment?

(Discussion off the record.)

JUDGE KLOVEKORN: Back on the record. Mr. Popowsky.

MR. POPOWSKY: Thank you, Your Honor. Perhaps we should state on the record especially for the benefit of the parties not here, the OCA's intention is to present Mr. Rothschild for cross on the 15th and Mr. Oliver for cross examination on the 17th.

MR. YOUNG: If it turns out we don't have anybody but Vanderslice on the 16th, I would like some flexibility to move him up to the 15th.

MR. POPOWSKY: Vanderslice?

MR. YOUNG: I can't tell how long we are going to need for the other people but assuming it's not all that extensive I would just as soon not troop all up here for Vanderslice.

MR. POPOWSKY: I assume there will be some accounting witnesses, too.

MR. YOUNG: Well, it depends on what they say.

MR. POPOWSKY: Good morning, Mr. Hecht.

WILLIAM F. HECHT, the witness on the stand at the time of recess, resumed the stand and testified further as follows:

CROSS EXAMINATION (Continued)

BY MR. POPOWSKY:

Q. We were discussing yesterday PP&L's response which has been identified as PP&L Exhibit 200.282060. Would you turn to attachment two of that document. Am I correct that that is a memo dated October 8, 1981 from you describing the current status of PP&L's effort to sell its interest or part of its interest in Susquehanna?

A. That's correct.

Q. And turning to the first page of that exhibit -- I am sorry, the first page of that memo, you state, am I correct, that in summary, although numerous contacts have been made with other utilities, no serious interest has developed, it is our intent to continue the agressive sales effort. I am sorry. That's in the cover letter, the first page.

A. That's correct, yes.

Q. Did that agressive sales effort consist of, with continued contacts with other utilities, an attempt to convince them to purchase portions of Susquehanna?

A. Is that a question?

Q. Yes.

A. Yes.

Q. Am I correct, though or did the effort include a reduction in the price of Susquehanna? Such as a possible reduction in the equity return?

A. As I think I answered yesterday, negotiations

didn't get to the point of that level of detail.

Q. Now, could you turn to attachment 3. And this is a memo or I am sorry, it is an outline and charts used at a presentation prepared by Mr. H. W. Wright, and your name is listed as one of the recipients of this memo and you provided it to us in response to the interrogatory and the attachment is dated October 23, 1978. Could you turn to the first page -- first of all, could you tell us who Mr. H. W. Wright is?

A. At the time, he was Manager, Interconnection Affairs. I believe he is now manager of Bulk Power Engineering.

Q. Turning to the first page of the outline which is attached to that cover letter, with reference to sales of capacity and energy, the first line there, this is in outline form, says decision based on judgment forecast of likelihood of disallowance. Do you know what the likelihood of disallowance there refers to?

A. I think generally, what it referred to was this. First of all, this outline was presented internal to PP&L and a great deal of narrative and discussion surrounded it. It's not entirely self explanatory.

The company was faced with a balance between two possibly conflicting interests. If we were to plan the power system for a minimum cost to customers over time, it

would be in the customer's best interest to retain the ownership of all of Susquehanna.

On the other hand, to retain interest in all of Susquehanna would result first of all in a burden, financing burden during the construction process and second of all, would result in a situation where the energy benefits resulting from Susquehanna, while they would more than offset the capital costs or capital related costs of the plant over the plant's life, they would not necessarily offset the capital costs of the plant in each year of the plant's life.

And so we had a judgment to make as to how much of a financing burden to undertake and how much of a shortfall in energy benefits offsetting capital related costs would be appropriate in the near term in order for the customers in the longer term to obtain the full benefits of retaining ownership to the entire plant.

It certainly was a matter of internal discussion that regulatory policy would play a role in determining how big a shortfall in energy benefits offsetting capital related costs of the plant in the very short term.

Regulatory policy would play a role in that decision and that's what's meant by disallowance. In other words, regulatory policy, policy of this Commission has an influence on whether or not the company can, in fact, plan

for minimum revenue requirements to customers over the life of the facility.

Q. And just to be clear, when you refer to likelihood of disallowance, you are referring to the likelihood of disallowance of some or all of the Susquehanna Plant or some plant from rate base as an excess capacity adjustment. Is that what the reference was to?

A. Any kind of a revenue shortfall, any kind of a revenue disallowance from the utility Commission, I point out that I am paraphrasing someone else's memo and interpreting it for you, but that's my understanding of it.

Q. Toward the bottom of that page, of that first page of that outline, with regard to sales of other units, that is other than Susquehanna, it states toward the bottom there, we would only consider Martin's Creek 3 and 4.

A. That's correct.

Q. Why did the company only consider or prefer to make its sales only from Susquehanna and Martin's Creek 3 and 4?

A. At that time, five years ago, 1978, an evaluation was made of the total revenue requirements from PP&L's customers under capacity sales of various types, selling Susquehanna ownership interest or selling Susquehanna by term contract as in the case with our arrangement with Atlantic City.

We also did that similar analysis for term contract

sale for a variety of PP&L's capacity. The oil-fired units at Martin's Creek 3 and 4 and various coal-fired power plants. It was determined that to sell Martin's Creek at fully allocated costs, for a term contract would result in, as of 1978, either modest benefits or break even to PP&L's customers.

But to sell other capacity, at fully allocated costs would result in a disadvantage to PP&L's customers that results from the idea that if we were to sell coal-fired capacity, while our customers would no longer pay the fixed costs, that is the fixed costs would be paid by the customer, the customer would no longer receive the energy benefits.

That is to say we would have reduced interchange sales which would tend to increase revenue requirements from retail customers and we would no longer have as much low cost coal-fired energy available to supply our own load and would require using higher cost fuel or even purchasing on the interchange more frequently to supply our own load.

The balance of those two resulted in the conclusion that selling any of our coal-fired capacity would result in an increase in cost to PP&L's customers in total revenue requirements.

Q. I take it the company was unable to sell portions of Martin's Creek and Susquehanna?

A. We were unable to sell under the particular terms

and conditions and the particular pricing method described in this memorandum of 1978. Subsequently, we were able to enter into economy energy transactions at considerable benefits to our customers, economy energy transactions outside the PJM Power Pool.

Q. Again, you are referring there to the Northeast Utilities and the Con-Ed?

A. That's correct. Our objective is to find, not merely to sell capacity because the capacity is, in fact, a benefit to customers over its life, but our objective was to find a sale which recognized for our customer's benefit, the total value of that capacity, that is to find a buyer and to develop terms and conditions and a contractual arrangement which would in fact provide an advantage to customers.

Q. By the way, I don't know if it's on the record, but what is the annual revenue from the Northeast Utilities sale? Do you know, approximately?

A. No, I don't have that. I believe Mr. Scheffley may have discussed that.

Q. I don't know if I got the dollar amounts from him. Perhaps that could be provided to us. I think he did give us the dollar amounts for the Con-Ed sale in an interrogatory response but I think we may have neglected to ask for the Northeast Utilities sale.

A. That could be provided.

Q. On the third page of this outline, where it says chart 15 recommendations, right above that recommendations, there's a statement, "If disallowed, something better than nothing." Do you know what was meant by that statement?

A. You are on what page?

Q. I am sorry. The third page of the outline. Right above the word recommendations?

A. Yes.

Q. It states, "If disallowed, something better than nothing." Do you know what that meant?

A. No. I am trying to put it in context. That's one statement as one part of chart 14 and I am trying to put it in context of approach number 3, the plus-minus in the remainder of that chart and I can't.

Q. Okay.

A. I think the chart also refers to, for example, has a statement GPU might not think enough protection. That chart might be referring to a description of a particular risk sharing discussion approach which we had with a potential purchaser at that time.

The concept was this. That if someone were to purchase a power plant, any power plant, in this case Susquehanna, by term contract, one approach is that the buyer pays the fixed costs whether or not the plant runs and the buyer gets the energy and pays the fuel cost, if and

when the plant does run. We call that full risk sharing.

From the purchaser's point of view, if there is a lengthy outage at a plant or the risk of a lengthy outage at a plant, it might induce the purchaser to negotiate for an agreement which says that if the plant operates at lower than a particular capacity factor, then there would be some reduction in the fixed charges.

So that chart, in general, goes back five years to a completely different time frame and different conditions, but I think at that time, we were suggesting that any contract should have full risk sharing and we were trying to recognize the possibility that some purchaser might not be willing to agree to full risk sharing and might want some reduction in the fixed costs in the event of a lengthy outage.

Q. Going to recommendations on that page, among the recommendations are disallowance likely, if not by ruling, then by delay. Another recommendation is sell Susquehanna at flow through and another recommendation is limit duration to 1989 which goes on to say get Susquehanna back when economical. Was it your opinion at that time that some form of disallowance was likely?

A. No. I don't think it was my opinion that some form of disallowance was likely. It was always our hope that the Commission would recognize that any project like Susquehanna

that has energy benefits over time has a time distribution of energy benefits which increase in the later years and are lower in the early years and that it's not possible to match the costs, the fixed costs of the plant with the energy benefits in each year.

It was our hope at that time that the Commission and other regulatory agencies, would recognize that in order to provide minimum cost of service over time that it is appropriate to build a plant like Susquehanna now in service in 1983 rather than to delay construction of that plant.

An attempt to place it in service when one might say it was needed only from a reliability standpoint, but incur, then, greatly inflated construction costs by delaying the construction, and it was our conclusion that studies that we've submitted in response to interrogatories have demonstrated that the earliest in-service date for Susquehanna resulted in the greatest benefits over time.

It was always our belief that the Commission would recognize the wisdom of that approach in minimizing customer costs over time.

Q. Was it your opinion at that time that Susquehanna would not be economical until 1989?

A. I can't reconstruct right now that arithmetic. There was always some period of time in the early years of the plant when the energy related costs do not cover the

capital related and O & M costs. Whether that crossover point was as late as 1989, when viewed from 1978, I couldn't say.

Q. What did it mean to "Sell Susquehanna at flow through?" Does that mean that the tax benefits would be of whatever portion were sold would be flowed through to the purchaser?

A. I don't know.

Q. Do you know whether Susquehanna was offered with flow through tax benefits to the buyers or was it offered with tax benefits normalized?

A. I don't know that either. Let's go back a little bit to 1978, which is when this report was written. This report, the time frame, the 1978 era was an era of great concern for oil consumption, and a great benefit was seen in the completion of Susquehanna as soon as possible and it was recognized that there were other utilities in the PJM pool such as GPU, which is mentioned in this memorandum, which needed installed capacity at that time.

So there was every reason to move ahead with construction, even though the costs of owning and operating the plant didn't match, weren't fully offset by energy benefits in the very earliest years.

Q. If I could go forward at this time to another attachment just for a moment, just to make a point, the last

attachment at page 12 -- and that's Attachment Number 5, which is a booklet dated March, 1981 -- an overview of alternative purchase arrangements for Susquehanna, which I believe you are familiar with?

A. Yes.

Q. And at page 12 -- I'll get to this later but just for this one point -- under the term taxes, there is a remark "fully normalized". Do you see that?

A. Yes.

Q. So was it, in your subsequent sales efforts for Susquehanna, was it your position that tax benefits would be fully normalized and not flowed through?

A. From the point of view of pricing to the purchaser, to the purchasing utility, it was our initial negotiating position that we would fully normalize tax benefits. But that was -- I would characterize that as a negotiating position rather than as a final offer.

Q. Can we go back, then, to the attachment we were just looking at. If we look at chart -- the recommendation there is sell Susquehanna at flow through. If we look at the chart 8 and chart 9, which are part of that attachment --

A. Of which attachment.

Q. Of Attachment 3.

A. Charts 8 and 9.

Q. Do you have those? Does that not compare the cost of Susquehanna with taxes normalized on chart 8 versus buyer's alternative and with taxes flowed through on chart nine versus buyer's alternatives?

A. That's correct.

Q. And if we look at Susquehanna with taxes normalized, the total costs, assuming the 70 percent capacity factor was 48.3 mills per KWH compared to buyer's alternatives to 23.1 to 43.7 mills per KWH. If we turn to Chart 9 for sales to Susquehanna with tax benefits flowed through, the cost for Susquehanna was 39.7 mills per KWH compared to buyer's alternatives of 42.1 and 43.7. Is that correct?

A. That's correct. However, I should point out that that comparison is only for the year 1983, and it was a proper projection made in 1978. And as you know, the comparison of normalization versus flow through for taxes may show one approach with a higher cost and the other with a lower cost in the first year, but over time, that relationship may reverse.

Q. Do you know when that crossover point would have occurred for Susquehanna?

A. No, I don't think that work was done. The material that you are referring to on Attachment 3 was an internal discussion to PP&L, attempting to develop various negotiating positions. As it turned out, our negotiations

with other utilities never got to this point.

Q. But it's correct that at that time, the company appeared to recognize that Susquehanna with normalization, at least in the short run, would be more expensive to buyers than their alternatives, whereas if Susquehanna was flowed through, according to those calculations, would have been less expensive.

A. In the initial year based on projections made in 1978, that's what the chart shows.

Q. Going back to the outline, itself, the recommendations, the last recommendation, which is page 3 of the outline, is investigate PPUC and FERC attitudes.

A. I am sorry. You are on which attachment?

Q. Still attachment 3, the third page of the outline.

A. Yes.

Q. The last recommendation was investigate PPUC and FERC attitudes.

A. Yes.

Q. Do you know attitudes towards what?

A. In particular here, I suspect that the attitudes they were interested in was the attitude of the Commission of various commissions toward making an investment, a large investment which would provide maximum benefits to customers over time, yet would require rate relief in the near term in order to receive those benefits later.

It was concluded fairly early that if we were to have delayed the plant, it would increase total cost to customers and in fact, even if we had not begun construction but instead had had perfect foresight and had planned a power plant for in-service only when needed for reliability, for example, that the effects of inflation and escalation on construction costs would have been such that benefits to customers over time would have been reduced. That is customer rates would have been over time, would have been higher, and we were quite interested in the Commission's attitude on a wide variety of subjects and among those, their attitude toward making a long-term investment decision in the customer's interest.

Q. Could you turn to attachment 4. Attachment 4, am I correct, is PP&L memo entitled PP&L Bulk Power Marketing Strategy for the 1980's. This was dated September, 1980.

A. Yes.

Q. If you turn to page 2 of the memo, itself.

A. Yes.

Q. It lists four reasons for entering into two party contracts outside of the PJM agreement. The reasons are more than adequate installed capacity in the 1980's, risk of an outage for Susquehanna SES, possibility of loss of split savings, pricing for interchange sales and lack of complete assurance of a market for interchange sales for the 1980's,

is that correct?

A. Yes.

Q. Would you agree that all four of those reasons for entering into two party contracts outside of the PJM still exist? That is, the company has more than adequate installed capacity in the 1980's. There is a risk of an outage at Susquehanna. Possible loss of split savings and the lack of interchange sales for the 1980's?

A. Those are all very brief statements and require clarification. To one extent or another, they have been true for every power plant that's ever built. They were true for Susquehanna then and will continue to be true to one extent or another for Susquehanna and every other power plant in the future.

For example, the statement more than adequate installed capacity in the 1980's refers to more than adequate from a reliability standpoint. The risk of an outage at Susquehanna is no different than the risk of an outage of any other piece of hardware on the power system, on any system and in fact, is one of the reasons why we install capacity in excess of peak load.

The possibility of loss of split savings, split savings is part of the PJM interconnection agreement which is a FERC tariff and is always, as with any tariff, subject to regulatory proceedings. The current outlook on split

savings is that split savings will remain in place for the foreseeable future.

There are strong pressures, or at the moment, I believe, stronger pressures to keep savings than to not keep them. Lack of assurance of a market for interchange sales works both ways. There was lack of assurance of a market for interchange sales at the time this was written, 1980, with the possibility of additional construction by other utilities.

Many of those construction plans have been canceled or delayed. There is also a risk of a greater market for interchange power than was foreseen in 1980 and our economy sales outside of the PJM pool are an illustration of that.

Delays in returning TMI 1 to service since 1980, there have been, I believe, delays in service of Limerick 1 and 2, delays in the in-service of Hope Creek 1 and cancellation of Hope Creek Unit 2 have all, in fact, indicated we might move in the direction of a risk of a greater market for interchange sales.

Q. Referring to those risks. Am I correct that the way the company has set up its rate structure, if the Commission were to include all of Susquehanna in base rates in this case, with energy savings going through the energy cost rate, who would bear the risk of an outage at Susquehanna? Who would bear the risk of replacing power

costs?

A. Customers would likely bear the risk of replacement power cost just as customers get the benefits of good operation of all of our power plants.

Q. Who would bear the risk that split savings pricing might be lost and interchange pricing may be reduced?

A. Customers would bear that risk just as customers have gotten the benefit of increased interchange sales outside the PJM pool and customers have received the benefits of interchange sales and split savings for many decades.

Q. Who would bear the risk of the lack of complete assurance for the lack of interchange sales for the 1980's?

A. I believe I have answered that question just a moment ago as well.

Q. It would be the customer?

A. They bear the risks in both directions. I might point out that the power plants that PP&L has built prior to Susquehanna, including Martin's Creek 3 and 4, even though they were oil-fired, for perhaps four or five of the seven or eight years of that facility's operation, interchange benefits have more than offset the fixed costs of that plant. And those benefits have been passed on to customers and in terms of our coal-fired plants, interchange benefits or more properly, the combination of lower cost fuel for our own

customers plus interchange benefits have all more than offset the capital related costs of those plants. So the exposures are two-way.

Q. When did the companies begin flowing through energy benefits from the interchange to ratepayers?

A. The company always recognized in base rate proceedings interchange benefits to customers. They flowed them through on a six month sliding average, I believe, beginning in, I may need some help on that, but when we went from a fuel adjustment clause to a net energy clause. We always recognized interchange benefits in customer bills. It was merely a question of timing. 1978, I believe is when we went to a net energy clause.

Q. And just finally, the note there more than adequate installed capacity in the 1980's, the company is asking PP&L ratepayers to pay for all its capacity at this time.

A. In order to obtain the benefits of Susquehanna in its later years, projected to amount to more than a billion dollars per year, they have got to pay, the fixed costs have got to be paid over the plant's life.

Q. If you could turn to page 5 of that attachment, with reference to a recommended sales proposal to GPU --

A. I am sorry. Which attachment?

Q. I think we are still on attachment 4, page 5. It states, "The recommended proposal to GPU is to offer to sell

capacity and energy from both Susquehanna SES and Martin's Creek 3 and 4 for the period 1981 through 1990 in amounts shown in Table 1. Contract times and conditions for both plants are to be similar to the Atlantic City Electric full cost of service and take or pay purchase from SES." Is that correct?

A. Yes.

Q. So that meant that GPU would, under your proposal, pay the full cost of service for those units, including a full cost return on investments and would have to pay for the units whether or not they were operating, is that correct?

A. That's correct.

Q. And GPU rejected that offer? Is that correct?

A. GPU, we've had a number of discussions with GPU. GPU rejected that offer. GPU has chosen thus far not to purchase capacity but to purchase economy energy, to meet their needs by purchasing economy energy either from the pool or outside the pool and current indications are that GPU may not meet their installed capacity obligation to the pool.

Q. At Table 1, page 6 of that attachment, does that indicate that PP&L was willing to sell 1,000 megawatts of Susquehanna and Martin's Creek combined for the period 1983 to 1987?

A. I would characterize all of these documents as negotiating positions. None of them were formal proposals to sell. They were negotiating positions.

Q. Was the company willing at that time to sell a thousand megawatts of Susquehanna and Martin's Creek between 1983 and 1987?

A. That's correct. We were willing to negotiate on that basis.

Q. Was it PP&L's position at that time that it could have sold a thousand megawatts of capacity between 1983 and 1987 and still be able to provide reliable service to its own customers and meet its PJM reserve obligations as well?

A. That's correct.

Q. Has PP&L's load growth since that time been such that the company could no longer sell 1,000 megawatts of capacity and meet, provide reliable service and meet its PJM obligations?

A. I am not -- I believe we could, yes.

Q. In calculating the impact of any sale to GPU on PP&L customers, what did you compare? Did you compare a sale to GPU versus potential sales on the interchange?

A. In part. We compared sales to GPU versus sales on the interchange and we also reflected in that the use of some higher cost fuel to supply PP&L's own customer load.

Q. In those cases, did you assume initially that the

costs of PP&L's generating plant would be included in PP&L's rates and then the proceeds from the sale would then be applied back as a credit against rates? Similar to the -- correct me if I am wrong -- similar to the way the Atlantic City Electric sale has been treated?

A. In this early analysis, in developing a negotiating position, it wasn't necessary to carry it that far. What we did was attempt to develop a negotiating position which would result in bulk power sale that would minimize total revenue requirements; regardless of who those revenues are derived from, we just made -- developed plans to minimize the costs of operating the system.

Q. Did you compare how ratepayers would fare if this plant were simply excluded from rates and then the company tried to sell the capacity to GPU versus the present situation in which ratepayers are asked to pay for all the costs of PP&L capacity with an opportunity to receive energy savings through the interchange?

A. No. As I've indicated, we looked at total revenue requirements and minimized total cost to customers.

Q. What I just described, is effectively what the relevant comparison would be for a sale such as the Salem 2 sale from PECO to Jersey Central? That is exclude the entire transaction from rates?

A. Well, the distinction between the Salem 2 sale and

Susquehanna is the capital cost of the two plants. Salem was a lower capital cost than Susquehanna; just as Susquehanna will be a lower capital cost than the power plants which succeed it in their in-service date.

To do that over time, if we were to do that in the very early years and consider doing that in the longer term it would result in a higher cost to customers, not lower cost to customers.

Q. But the term of the Salem sale is for a term of several years, is that correct? Not for the life of the plant? Are you --

A. The current agreement is for that term. There may be conceivably subsequent agreements which could conceivably pass on much greater benefits to the share owners of the owning utility at the dis-benefit of their customers.

Q. Could you turn to attachment 5 which you referred to briefly before. That is an overview of the alternative purchase arrangements for Susquehanna dated March, 1981.

A. Yes.

Q. And this document was provided to various utilities as part of the company's sales effort, is that correct?

A. That's correct.

Q. And at page 8, it lists the reasons for selling Susquehanna or selling an interest in Susquehanna. Is that correct?

A. Yes.

Q. And the second reason there is regulatory considerations.

A. Yes.

Q. The regulatory considerations there, would they be similar to the ones you discussed earlier?

A. Regulatory considerations here are similar to the ones I discussed earlier and, in fact, in our discussions with other utilities both inside and outside Pennsylvania, were along the very same lines and that was this.

One purchasing utility made very similar observations, that if, in fact, their state regulatory agency wanted them to plan for minimum cost of service over the long term, that it was appropriate that they purchase Susquehanna. But if their Commission were interested in minimizing costs in the very short term at the expense of longer term, then their Commission might suggest they not purchase Susquehanna.

At least one purchasing utility made that point to us very clearly that their feeling was on the management level in the company that they should, in fact, embark on a purchase of nuclear capacity of the Susquehanna vintage, relatively low cost nuclear capacity when compared with the alternative of the purchasing utility constructing their own.

But if their regulatory agency chose, instead, to minimize only short run costs, then they would, in effect,

have limitations on their ability to act in their customer's behalf in the long term.

Q. Would you turn to page 12 of that attachment. Am I correct that included in the terms of your sale there were 12 percent return on capital, which in turn, included a 15.8 percent return on common equity. Is that correct?

A. Those were negotiating numbers in 1980, I believe, yes.

Q. Was that all --

A. '81.

Q. Was that 15.8 percent return equal to the return that had been granted to PP&L by the PUC in its most recent rate order, if you know?

A. I don't know. It may have been related to that. It may have been related to realized return.

Q. And again, it says on that page taxes were to be fully normalized, is that correct?

A. Again, that was a negotiating position at that time.

Q. And starting at page 16, there, you present an analysis of potential benefits to the buyer of portions of Susquehanna.

A. That's correct.

Q. Would this analysis be similar to the benefit analysis that you provided in this case, in Exhibit WFH-3?

A. It's similar in principle.

Q. On page 24 you show benefits to the buyer of the purchase of 100 megawatts of Susquehanna between 1983 and 1991, assuming 75 percent of capacity factor, is that correct?

A. That's correct.

Q. The benefits are if two percent sulfur oil is displaced, $250 million for 100 megawatts and if distillate oil was displaced by Susquehanna, the benefit would be $1.1 billion, is that correct?

A. That's correct.

Q. If one of these fine utilities were to purchase 500 megawatts as opposed to the 100 as shown in this example would the benefits have been five times as great?

A. Yes. Within the -- these are very round numbers and you must recognize they were made in general to illustrate to a variety of potential purchasing utilities the range of benefits and it was certainly understood when we did this that this was just an illustration and we weren't trying to analyze someone else's power system for them, if you will. It was understood that a purchasing utility would do much more thorough analysis of their own system.

Q. How many utilities received this booklet? Do you recall?

A. No, I don't recall.

Q. Would it have been all the utilities in the PJM and many utilities in the area around --

A. I don't believe we sent the detail or rather the complete booklet to all those utilities. All the utilities were solicited, and those that expressed interest or those that expressed any desire for further discussion or curiosity were sent the booklet.

Q. But it's correct that no utility made a purchase after receiving this booklet?

MR. YOUNG: We must have that on the record ten times.

MR. POPOWSKY: I will accept that as an answer.

BY MR. POPOWSKY:

Q. As discussed earlier, I believe the company's initial sales efforts concentrated on sales of Susquehanna and Martin's Creek 3 and 4. Is that correct?

A. That's correct. It was a negotiating position.

Q. Am I correct that more recently, the company has stated a willingness to sell a proportionate percentage of all of its generating capacity?

A. That's correct.

Q. And has negotiated -- concerning the possible sale of 10 percent of the company's entire generating system through the year 1995, is that correct?

A. I think that 10 percent number was only general discussion. I don't know that that 10 percent number was

ever tied down. I think we were quite open to trying to meet the needs of the buyer as well as ourselves, the selling utility, to try and find some arrangement that would benefit both parties.

Q. Well, could you turn to one of the other interrogatory responses? This is in response to a staff data request, R-14 and it's identified as PP&L Exhibit 200.182051. Its's one of the ones that was handed out yesterday.

A. Yes.

Q. On the first page of that exhibit, the last paragraph states, does it not, that negotiations with GPU have centered around a purchase of an equal share of 10 percent of each of PP&L's own generating units from now through December 31, 1995. Is that correct?

A. That is correct.

Q. Has the company negotiated, itself, for any additional capacity energy beyond the 10 percent that it's negotiated with GPU?

A. I don't know what you mean by beyond the 10 percent. We have negotiated with a number of utilities. Some of those discussions are continuing. I think we consider it premature at this point to be concerned with whether it should be 10 percent or 12 percent or 5 percent.

Q. Could it be more than 10 percent? In total?

A. It would depend on the particular terms and conditions of the agreement and it would depend on the time frame or term of the agreement. In the very early years, we might be willing to negotiate for 10 percent.

If our outlook for future interchange changes from year to year over the longer term, we might find it to the dis-benefit or disadvantage of our customers to sell as much as 10 percent and we are attempting to find some compromise area where there are benefits to the PP&L customers in the early years, but benefits to the purchasing utility in the later years.

Q. Is the company willing -- has not the company stated that it would be willing to sell 10 percent of its system generating units to GPU through 1995?

A. No. It says negotiations have centered around that concept.

MR. POPOWSKY: Could I have just a moment, Your Honor?

(Pause)

BY MR. POPOWSKY:

Q. Could you turn to another one of the exhibits that I provided you, 200.282090, attachment 3.

A. Yes.

Q. You state that the 10 percent figure for GPU is only a negotiating term.

A. That's right.

Q. If we look at attachment 3 to 200.282090 entitled PP&L's Bulk Power Negotiations -- and this was dated November 11, 1982 -- on the second page, the second paragraph, does that not state that on September 21, 1982 PP&L received a written proposal from GPU to purchase 10 percent of PP&L generating capacity and related energy production from now through December 31, 1995. Is that correct?

A. I am sorry. I haven't found that. I have Attachment III which is a tabular comparison of negotiating positions of GPU and PP&L at October 1, '82.

Q. I think that is Attachment Roman III to Attachment Number 4.

A. I see. Okay.

Q. I am looking at attachment Arabic 3.

A. Okay.

Q. And the second page of that, does that not state that on September 21, 1982, PP&L received a written proposal from GPU to purchase 10 percent of PP&L generating capacity and related energy production from now through December 31, 1995. Is that correct?

A. That written proposal was to purchase 10 percent but it had a number, a fairly substantial number of important issues that were left open.

Q. Does it not state in the next paragraph of that

memo that on October 1, 1982, PP&L delivered a written counter proposal for GPU. The counter proposal left the amount of capacity and term of the agreement the same as in the GPU proposal.

A. That's correct.

Q. So then the company has, in a counter proposal to GPU, offered to sell 10 percent of its generating capacity in a written proposal to GPU, 10 percent of its generating capacity and related energy production from now through December 31, 1995?

A. No. That is not a complete characterization of the proposal. There were important issues that were left unresolved other than the amount of capacity which had a substantial effect on the cost that such an agreement might have had to PP&L customers.

In fact, if you read attachment Roman I to that attachment, a letter from John Graham to Mr. Harley Collins, you can see in there that on the first full paragraph on page 2 of that letter, as you know, there are issues which have been under negotiation as to the elements of, et cetera, and those items, when we actually sat down to negotiate and work out the details, those items amounted to substantial disadvantages to PP&L's customers.

Q. I am not suggesting you have reached an agreement. I am only trying to determine whether you have offered to

sell 10 percent subject to negotiation with regard to many other important terms such as pricing.

A. That's right. Subject to all those other considerations, that's true.

Q. Now, if the company is willing to sell, assuming you could get the right price, if the company is willing to sell 10 percent of its capacity and energy through the year 1995, would the company be willing to sell more than 10 percent, let's say through the year 1987, in the short term?

A. Not necessarily. A sale of 10 percent results in modest advantages or perhaps break even economic situation to PP&L's customers through about 1985, 1986, 1987, in that time frame.

Beyond then, it results in a cost to PP&L's customers, that PP&L's customers would have lower costs if PP&L were not to enter into an agreement and in fact, were to instead, continue to use that lower cost energy for our own load and obtain economy interchange benefits from PJM and outside the pool and pass those benefits on to customers.

So once again, we have a balance of short term costs and long term, short term, rather advantages to PP&L customers, rather modest or break even and long term disadvantages to PP&L's customers that are projected to become very substantial. It's a question of do we want to limit today's cost of service to the absolute minimum at the

expense of the future.

Q. My question though only dealt with the short term. Could the company sell more than 10 percent of its capacity and energy let's say in the period 1983 to 1987? First of all, from a reliability standpoint?

A. From a reliability standpoint, that's possible, but from a cost standpoint without doing some analysis that may well be costly to PP&L's customers. Depending on which utility it was sold to. Internal to or external to PJM, it could be substantially disadvantageous to our customers.

What you are suggesting is that merely by reducing our installed capacity we can in some way advantage PP&L's customers. And that's not necessarily true.

The thrust of our whole analysis is that that installed capacity provides substantial economic benefits to customers and if that capacity is sold, it can create the paper appearance of smaller reserves, but at some considerable costs to retail customers and that hasn't been our criteria for planning.

Q. I understand that. Is it correct that the company believes it would be able to provide reliable service to its customers? I think your answer to the last question subsumes this. I won't ask it again.

Am I correct that the company has not attempted to sell, for example, all of its peaking capacity? Where

negotiations have not centered on that type of sale? Combustion turbines?

A. That's correct for a number of reasons. First of all, combustion turbines provide an important aspect of reliable service to customers, separate and apart from the relationship between total installed capacity in megawatts and total peak load in megawatts. That relationship which you've been focusing on, installed capacity and so-called reserve is a very narrow measure of one very narrow aspect of total reliability of service.

Combustion turbines and that sort of peaking capacity provides an important aspect of reliable service both in terms of the ability to operate the system and follow load, follow sudden load changes, pick up load following the unexpect outage of a large unit.

It enhances the flexible operation of the transmission system within reliability constraints and so forth and so PP&L's combustion turbines, for example, in addition to being peaking capacity, are a necessary part of the system.

They are required to start up the power system following a blackout, for example, and other emergency purposes. If the combustion turbines wouldn't be there, we would be buying or installing something in their place. I believe that's described in response to an interrogatory.

Q. I think it's covered in your testimony, as well.

Could you turn to attachment 1 to the the response numbered 200.282090.

JUDGE KLOVEKORN: Mr. Popowsky, before you begin this, would this be an appropriate time to take a recess?

MR. POPOWSKY: If I had two more minutes I could finish my line of questions.

JUDGE KLOVEKORN: Let's take a brief recess.

(Whereupon, a brief recess was taken.)

JUDGE KLOVEKORN: Let's go back on the record.

MR. POPOWSKY: Your Honor, I would like to identify four additional exhibits at this time. These, I believe, have been provided by the company to all the parties and I have also provided three copies to the reporter and copies to the other parties that are present today and I would like to have identified at this time by their PP&L exhibit designations, PP&L Exhibit 200.282099, PP&L Exhibit 200.282066, PP&L Exhibit 200.582027 and PP&L Exhibit 200.282080.

JUDGE KLOVEKORN: Without objection, they will be so identified.

(PP&L Exhibit No. 200.282099, Response to Interrogatories of the OCA, Set I - Capacity Requirements/Energy Savings, dated January 3, 1983, was produced and marked for identification.)

(PP&L Exhibit No. 200.282066, Response to Interrogatories of the OCA, Set I - Capacity Requirements/Energy Savings dated January 3, 1983, was produced and marked for identification.)

(PP&L Exhibit No. 200.582027, Response to Interrogatories of Susquehanna Alliance - Set III, dated February 6, 1983, was produced and marked for identification.)

(PP&L Exhibit No. 200.282080, Response to Interrogatories of the OCA, Set I - Capacity Requirements/Energy Savings, dated January 3, 1983, was produced and marked for identification.)

MR. POPOWSKY: Thank you, Your Honor.

BY MR. POPOWSKY:

Q. Mr. Hecht, continuing with one of the documents that was presented yesterday, 200.282090, attachment 1 to that response is a description of PP&L's bulk marketing effort dated August 18, 1982, is that correct?

A. Yes.

Q. And I believe it's stated at page 4 of that document that PP&L believes that a sale of around 500 megawatts at full cost of service price would be in its customer's interest even though there would be a small increase, .2 cents per KWH, 2 to 3 percent in 1990 in customer revenue requirements. Is that right?

A. That's right.

Q. Is that .2 cents per kilowatt-hour referring specifically to the year 1990?

A. That's correct.

Q. Is it correct that your analysis shows that in the early years of such a sale, the revenue requirement would be

slightly lower and in the later years it would be higher than otherwise?

A. That is correct.

Q. Did you perform a present value analysis of those revenue requirements over time?

A. We may or may not have. We did perform some present value analyses. I am not sure if we did on these particular data, this particular vintage.

Q. Now, referring to attachment 3 which was discussed somewhat earlier, concerning the proposal to sell 10 percent of PP&L's capacity and energy through 1995 --

A. Attachment 3.

Q. That's attachment Arabic 3.

A. Yes.

Q. We have already discussed the term and the number of megawatts in the proposal and you indicated that there were problems arriving at a price to be paid.

Am I correct that PP&L is proposing or has proposed to GPU that it be paid full cost of service on 10 percent of its generation transmission and applicable general plant until the cumulative present worth of these payments is equal to 95 percent of the cumulative present worth of what PP&L would have received on this capacity and energy on interchange sales? Is that correct?

A. That was one concept that was discussed, yes.

Q. Just so I understand, when you refer to 95 percent, would that be 95 percent of what the company would get under split savings?

A. We used -- discussions were very preliminary and very general. We used the term what we would have received under split savings and that could -- there are a number of details that were never worked out, the number of ways it could have been done.

It could have been 95 percent of what we would have gotten under split savings. It could have been 95 percent of our direct -- what our direct cost of power would have been had we not had such an arrangement. It was a general concept rather than anything that was really tied down at that time. It was a concept of moving from cost based to value based.

Q. And would that have been just 95 percent on a fifty-fifty split, so that in effect, you would receive 47.5 percent which is 90 percent -- 95 percent of 50?

A. Not necessarily, no. As I said, it never got that specific. Let me explain a little bit of the background.

If we sell -- if we were to sell to GPU 10 percent of our system at fully allocated costs, in the very early years it would provide a benefit to PP&L customers or break even, very modest change. GPU, since we are in the same power pool, energy that we sell to GPU through this sort of

bilateral transaction would be energy not available to other utilities on economy energy on the pool.

So that any benefit to PP&L's customers is linked with a dis-benefit or disadvantage to the customers of some other utility.

The customers primarily affected by such a transaction are PP&L's customers, or the customers of the two utilities involved in the transaction, and to a lesser extent, the other members of the pool.

So what we had is a situation that since we have an existing agreement with GPU, the PJM agreement, it is not a question of running capacity for GPU that would not otherwise be operating.

It is instead, continuing to operate all the PJM capacity on economic dispatch, but instead, re-assigning some of that energy to GPU's account as soon as it's generated through a bilateral arrangement?

In years when we would see a benefit to PP&L's customers, we would see a disadvantage to the GPU customers or likely see one. In later years when we would see a disadvantage to the PP&L customers, we would see an advantage to the GPU customers.

Well, as you can see, then, there would be no basis for an agreement or any hope for a negotiation if one party held out for advantages for its own customers throughout the

whole term of the agreement, because if one party has an advantage throughout the whole term of the agreement, the other party, of necessity, has a disadvantage.

PJM is a zero some gain, if you will, so we attempted to develop a scheme in which we would somehow, these would balance each other out and the scheme that was discussed at that time in -- I wouldn't say detail but for some period of time was one in which we would price the capacity and energy at cost in the early years and price it at value, that is value as defined by the interconnection agreement in the later years.

In an attempt to provide benefits to PP&L in the early years and benefits to GPU in the later years, we were never able to work out the details.

Q. When you say at cost, your cost includes the full cost of service including return on investment?

A. That is correct.

Q. Is it correct that the price that PP&L could get from another PJM member would have to be less than split savings? Otherwise, there would be no incentive for the other PJM member to purchase from PP&L? On the bilateral?

A. That is likely to be true, although not necessarily true. Some utilities may desire to purchase installed capacity at a price -- installed capacity and related energy at a price something above economy energy if, in fact, they

need that installed capacity to meet their installed capacity obligation to the PJM pool. So it's a little bit more to it.

Q. Could you turn to PP&L response 200.282066, which I just provided to you. Am I correct that attachment 1 to that response shows the company's most recent estimate of PP&L's capacity and peak loads for the periods 1982 to 2010?

A. That's correct.

Q. And that this estimate contained in response to an OCA interrogatory supercedes the projections which were included in the comparable tables contained in exhibit WFH-1 in this filing?

A. That's correct.

Q. And when was this more recent projection prepared?

A. I believe it was prepared in about November of 1982. This more recent projection, while it supercedes the load capacity reserve table in Exhibit WFH-1, it is consistent with the material submitted in response to Regulation 1(b)6.

Q. And would it also be consistent with Mr. Beamer's most recent load forecast?

A. I believe it is, yes.

Q. For the first year of the projection, 1982, the company projected a winter peak load of 4850 megawatts. Is that correct?

A. Yes.

Q. I assume that when you did that, you were assuming some sort of normal weather conditions, since you probably can't predict the weather for purposes of peak calculations?

A. That is correct, yes.

Q. And that's as compared to a net installed capacity, you have to take into account the sales to Luzerne Electric of 60.35 megawatts

A. Yes.

Q. Which would have produced a reserve margin of 32.7 percent, is that correct?

A. Yes.

Q. Now, could you turn to another of the documents I handed you which is a response to a Susquehanna Alliance Interrogatory Number 27 and has been designated as PP&L Exhibit 200.582027?

A. Yes.

Q. And this is a portion of the company's "Profile" for 1982. Is that correct?

A. Yes.

Q. And on the next to the last page of that exhibit, does it indicate there that the company's winter peak for 1982, which actually occurred early in 1983, was 4489 megawatts?

A. Yes.

Q. Which produced a reserve capacity of 45.8 percent

at the time of the winter peak?

A. Yes.

Q. Now, does this reserve percentage account for the sales to Luzerne electric or must some adjustment be made or is this 45.8 a comparable number to what is shown in the prior exhibit?

A. I would have to check. I think it may, instead of showing the sales to Luzerne as a capacity sale as on the load capacity reserve table, it may treat the sales to Luzerne as a load. So the numbers are not exactly comparable, but may be approximately so. We can check on that.

Q. I take it this is an actual winter peak and it has not been weather normalized. Is that correct?

A. I don't know.

Q. Could you check on that and tell us if it's not a weather normalized peak, what the weather normalized peak would have been?

A. I can check on it or we'll have Mr. Beamer check on that.

Q. Thank you. If you turn to the last page of that attachment, am I correct that it states that at the time, with reference to PJM, at the time of winter peak, the PJM reserve percentage was 72 percent.

A. Yes.

Q. Do you know whether that's at the time of the PP&L winter peak or at the time of some PJM maximum coincident peak?

A. I believe it's at the time of the PJM peak. I don't know if that was exactly coincident with the PJM peak hour or not.

Q. Do you know what the PJM reserve was at the time of the PP&L peak? Winter peak this year?

A. No, I don't.

Q. Is that a number that you can obtain easily or -- and if so, I would ask you to provide it if it's different from the 72 percent that's shown here?

A. We can check that, sure.

Q. Now, in your testimony, at page 27, you indicate that there are two basic criteria which are appropriate for evaluating the amount of generating capacity. And those criteria are reliability of service and economy of service, is that correct?

A. That's correct.

Q. Dealing first with reliability, am I correct that or is it your position that the addition of 945 megawatts from Susquehanna Unit 1 in 1983 is necessary in order for PP&L to meet its reliability requirements?

A. It is necessary -- it's the most economical way for PP&L to meet its reliability requirements over time.

Q. But it is not the minimum reserve requirement from a reliability standpoint?

A. Not for the very short term, no.

Q. Am I correct that the addition of Susquehanna capacity in 1983 increases your reserve margin in 1983 to 2460 megawatts or 50 percent. Is that correct?

A. I believe the data that you are looking for are on the interrogatory you handed out, 200.282066.

Q. And am I correct that that indicates that in 1983, the company's actual reserves, assuming that its projected peak is 4920 megawatts, that its actual reserves would be 2460 megawatts or 50 percent, is that correct?

A. That's right. That includes combustion turbines and diesels required for area protection and backstart and for a load following and so forth.

Q. And the addition of Susquehanna Unit Number 2 in 1984 will increase your projected reserves in 1984 to 67.3 percent, is that correct?

A. That is what the exhibit shows.

Q. Now, at page 28 of your testimony, you state that, "The lowest cost reserve level may be above the minimum level needed for reliability." Is that correct?

A. That is correct.

Q. During the period the rates in this case are likely to be in effect, is it your position that Susquehanna Unit 1

produces the lowest cost reserve level?

A. It's not possible to judge, providing the lowest cost reserve level in a one-year time frame because power plants are built with a 40 year life and it has no meaning to examine the lowest cost method of providing reliable service for one year.

Q. Would you agree, though, that for the period the rates in this case are likely to be in effect, if we could just limit ourselves to that term, that the reserve level produced by the addition of Susquehanna, that is what you would characterize as the lowest cost reserve level during that period? And just confine yourself to that period.

A. No evaluation has ever been made or could ever be made in providing the lowest reserve level for one year. Power plants don't have a one-year life.

Q. Am I correct, according to your exhibit as you originally calculated in WFH-3, you don't expect the Susquehanna units to provide a net economic benefit to ratepayers in any single year until 1989, is that correct?

A. That's correct. Yes.

Q. You stated earlier that economic evaluations of a plant cannot be done on a one-year basis?

A. That's correct.

Q. And you have provided a long-term economic justification for Susquehanna in your testimony and exhibits,

is that correct?

A. Yes.

Q. And you state at page 29 of your testimony, am I correct, that it is important to measure the economics of a generating unit over a relatively long period of time?

A. Yes.

Q. Now, when you examine the economics of a generating unit or make any comparison of economic costs and benefits over a long period, do you think it's appropriate to equate the value of a dollar spent in 1982 with a dollar saved in 1999?

A. There are a variety of opinions on that subject. In the case of an unregulated industry making an investment decision, I suppose there are many that would argue that the cash flow should be present value and a decision made on an investment on that basis.

In the case of a regulated industry, we make our analysis on the basis of revenue requirements, total cost of service. So our concern then becomes should we or should we not present value costs to a consumer.

The question becomes sort of a philosophical one. That is from the consumer's point of view, is a dollar tomorrow, should it be valued the same as a dollar today and if not, what discount rate to use.

One could argue, for example, that if PP&L were to

increase its rates by one dollar one year from now, that a customer might say that we might argue under the present value approach, that we are only going to increase rates 90 cents.

A customer would then come back and say but, you know, one year from now, I have got to find a dollar to pay my electric bill, not 90 cents. The present value philosophy would say to the customer no, find 90 cents now and you will get interest on it, and tomorrow, when you get your electric bill, you'd have a dollar there to pay your electric bill.

That's not the way most consumers budget their resources. They pay their electric bill out of current revenue, current income. So there's some philosophical discussion on whether or not the present value and if the present value, what discount rate to use when you are dealing with customer revenue requirements. From, for our analysis here, we have presented the data in the simplest possible manner in current dollars, rather than present value.

Q. So when you state, for example, at page 40 that over the 20 year period of your analysis, the net benefits associated with SSES are projected to total more than $10 billion. When you make that net, you are netting, in part, dollars spent in 1982 against dollars saved in 1999 and you are assigning the same value to those dollars, is that

correct?

A. In that statement, we are, yes. And I believe this was the subject of some discussion in interrogatories. We provided, I believe, some present value analysis of these same data in an interrogatory, as well.

Q. Have you calculated when in present value terms the total benefits from Susquehanna would begin to outweigh the costs of Susquehanna?

A. If we did, it was in response to an interrogatory and I can attempt to find that for you.

Q. Well, let me just ask you this.

A. Interrogatory 200.282067 was one and I believe there was another from the Susquehanna Alliance in which we provided a present value analysis.

Q. Am I correct that it's stated in 200.282067 from the point of view of PP&L the appropriate discount factor to be used, if a discount rate were to be applied, would be the weighted cost of capital to PP&L?

A. That is one approach. PP&L has, as I've pointed out, I think you are getting into the realm of what might be considered philosophical arguments in addition to technical issues.

Q. In giving that response, which is not a part of the record, am I correct that the company did not actually set forth in that response when the crossover point would be in

present value terms for Susquehanna applying that discount factor?

A. I believe that's true.

Q. Would it be sometime after 1989?

A. Yes, it would be.

Q. When you performed your long term economic analysis of Susquehanna, what did you compare it to?

A. We compared it to a situation in which we would not have built Susquehanna.

Q. And how did you project that PP&L would make up for the lost capacity and energy from the absence of Susquehanna?

A. Interchange purchases.

Q. Is that a realistic assumption?

A. It's a conservative assumption. Were we to assume -- it understates the benefits of Susquehanna. Were we to have compared Susquehanna with having constructed some alternative power plant to begin service at some later date when needed for reliability, that power plant would have gone in at some greatly inflated cost.

The construction costs of a late 1980 power plant, something in the range of Seabrook, for example, which now has a $7 billion pricetag and so forth. And as a result, that would have, had we compared Susquehanna with a world in which we would have built a power plant with perfect foresight with regard to load growth, that is, perfect

forecasting with some alternative power plant at an inflated cost, the benefits of Susquehanna would have been greater.

Q. You wouldn't have necessarily had to build another nuclear plant, that is correct?

A. That's correct.

Q. How did GPU make up for the loss of TMI 1 and TMI 2? Did they just go to the interchange and buy power at split savings?

A. GPU initially bought interchange power from PJM and in addition, had energy from Martin's Creek 3 and 4 made available to them at, I believe, cost plus 10 percent from PP&L.

Subsequently GPU, along with other members of the PJM Power Pool went outside the pool, purchased energy, economy energy from systems outside the pool on a short term basis. And GPU has not provided for a long-term assured source of energy to meet their obligation to serve customers.

Q. But the GPU companies have gone, both within and outside the pool, made purchases such as the Salem purchase, purchases from Detroit Edison and other utilities to make up for --

A. As has PP&L.

Q. But I am saying if one were to compare, if in 1979 one were to ask you to say what were the costs of an outage of TMI 2 and 1 and compared it to the assumption that all

GPU would have done would have been to go on the interchange and buy at split savings, do you think the necessary replacement power costs assumed under such an analysis would have been higher than what they would have been?

A. I am not sure how that relates to the relevancy.

Q. Regardless of the relevancy. If your attorney has an objection, fine.

MR. YOUNG: May I have the question read again?

MR. POPOWSKY: I will rephrase it. If in 1979 someone had to do an analysis of the cost of replacement power of an outage at TMI 1 and 2, if one were to assume at that time all GPU would have done would have been to go outside or to stay within PJM and buy in the interchange, would not the replacement power costs, based on such an assumption, have been higher than what they proved to be in reality.

MR. YOUNG: Are you just talking about a short term fix? The witness has already said they haven't solved their long term problem.

MR. POPOWSKY: I will be glad to confine the question to that date.

MR. YOUNG: Then I do object to the relevancy. We are talking about a plant that's going to be on for 30, 40 years and I don't think there is any relevancy to that plant and a short term fix that somebody has when a plant goes out.

MR. POPOWSKY: I am trying to get at whether or not

the economic analysis has taken the most realistic assumption. I am using TMI as an analogy. If you were to compare, PP&L says that Susquehanna is going to produce certain economic benefits. One has to ask economic benefits compared to what? Early years of the plant?

I am trying to explain whether other alternatives other than the assumption that PP&L will simply go out and try to replace 2,100 megawatts at base load capacity by buying on the interchange could have been utilized in the analysis and I am using the GPU as an example as to what has happened over a four or five year period and how those costs have gone up or not gone up.

MR. YOUNG: I think it is still an irrelevant illustration because GPU is simply seeking a short term fix whereas what you're asking the witness here to do is to compare having Susquehanna for 40 years versus not having Susquehanna for 40 years.

MR. POPOWSKY: I can ask the question hypothetically, if that will solve the problem. It doesn't have to be GPU, but it seems to me it is a relevant example.

JUDGE KLOVEKORN: I am afraid I have to agree with Mr. Young.

BY MR. POPOWSKY:

Q. Is it likely that PP&L would do nothing other than purchase energy off the PJM interchange for the next 20

years if there were no Susquehanna?

A. PP&L would attempt to obtain the lowest cost energy to supply its own customer load. The opportunities are rather limited because of the full loading of the PJM transmission system from outside pools for one reason. I believe that was discussed at length by Mr. Scheffley yesterday.

So there is no more transmission capacity available. Additionally, in the time frame that PP&L is looking at or would be looking at for capacity. It is now 1983, when there is capacity available. When we are in a downturn in the economy. But some years later that capacity may not be available and in fact, projections indicate that it would not be available, that just in those years, when PP&L would be looking for capacity, so would other companies be looking for capacity and it would be a seller's market.

Your question goes, perhaps deeper into the nature of our analysis. What was Susquehanna compared with and were those assumptions biased to make Susquehanna look more economical rather than conservative assumptions to make Susquehanna look less economical.

Our base analysis, in addition to sensitivity studies which looked at worst possible events, our base analysis was in fact conservative and understates, if anything, the value of Susquehanna.

Whenever we had a choice to make on what to compare Susquehanna with, what other conditions would prevail on the PJM interconnection, we consistently chose where there was a choice to make, we chose the scenario that would result in the minimum benefits that one would derive from Susquehanna.

For example, we assumed that TMI 1, in comparing the energy benefits of Susquehanna, would return to service in January, 1984. Simply because that's an advertised date, although there are those who would argue that TMI will be late. That understates the benefits in 1985 of Susquehanna by $20 million.

TMI 2 was assumed to begin service January 1, 1988 in your base analysis. There are those who would argue that TMI 2 wouldn't return to service that early. That understates the benefits of Susquehanna in 1988 by an additional $30 million.

Hope Creek Unit 1 was to go into service January 1, 1987 and there are ongoing discussions in New Jersey regarding the future of Hope Creek 1. That understates the benefits of Susquehanna in 1987 by $25 million.

Limerick Unit 1 was assumed to go into service April 1, 1985 because that is the currently published date. If that plant is late, that unit is late, the benefits of Susquehanna in 1986 are $20 million higher.

Limerick 2, October 1, 1987, is the currently

published date and if that unit is delayed, we have understated the benefits of Susquehanna by $25 million in 1988.

There are similar assumptions that are explained in our materials regarding oil to coal conversions on the PJM Power Pool which again are conservative and cause us to understate, if anything, the benefits and advantages of Susquehanna. Beyond that, we have, in carrying the analysis out in time, had to make assumptions regarding the installation of additional capacity by other companies.

Much of this capacity beyond 1990 or 1991, some 3500 megawatts in total, is uncommitted and sites haven't even been chosen and we know that power plants have about a ten year lead time for construction and we are now in 1983. So it is fairly unlikely that these units which have been stated in plans on paper by other utilities, it's very likely that those are optimistic in-service dates and yet we went with those optimistic in-service dates to again provide a conservative estimate of the benefits of Susquehanna.

Q. When you refer to your worst possible case contingency scenarios, is it your opinion that a 60 percent capacity factor for Susquehanna is the worst case?

A. Mr. Koppe will discuss that.

Q. Well, I understand Mr. Koppe has presented the company's capacity factor but you referred to these

contingencies as worst case. If you think a 60 percent capacity factor for a thousand megawatt boiling water reactor is a worst case scenario?

A. Yes, I do and in fact, I make this statement very strongly for two reasons. Number one is we have assumed not a 60 percent capacity factor for any one year, which may or may not happen. We may have 60 percent one year and 80 percent another year. We have assumed 60 percent over the entire life of the study.

Additionally, while we assumed a 60 percent capacity factor for Susquehanna, we retained an assumption of 70 percent capacity factor for all of the other new nuclear units on PJM, which is conservative. It rather seriously understates the benefits, the economic benefits of Susquehanna.

A more realistic worst case might have been if we assume a 60 percent capacity factor on Susquehanna, then those kinds of things which would drive down the capacity factor on Susquehanna might also drive down or should logically be expected to drive down the capacity factor of other nuclear units. If we would have made that assumption, the benefits of Susquehanna would be greater.

Q. Would you agree that if Susquehanna operates at less than a 60 percent capacity factor, that as the company's energy cost rate is presently constituted, the

ratepayers would bear the cost of replacement power for that unit?

A. That is correct. Just as they would bear the benefits of the improved operation of the plant, should it operate higher than 70 percent and just as they would obtain all of the benefits of the plant over and above the fixed costs of the plant beyond the break even point of 1989.

Q. The company's energy cost rate does not contain any minimum efficiency standards or capacity factor requirements at this time, does it?

A. No, it does not, although I believe the record shows that PP&L's generating capacity has, by and large, operated either at or almost at the highest availability rate on the PJM Power Pool and some of our plants have been in the top few nationally in their performance.

Q. And it goes without saying that these were not nuclear --

A. Those benefits are passed on to customers.

Q. But these were not nuclear plants as of yet?

A. That's correct.

Q. With regard to the company's assumptions for oil prices used in your base and in your contingency analysis, what escalation rate did you assume for increases in oil prices over the length of the your analysis?

A. Okay. Oil prices and prices of other commodities

or input data are described on figure 10 of Exhibit WFH-3.

Q. And could you give the actual escalation rates in real and current dollars that you are projecting for the price of oil? Residual oil, for example?

A. We could back calculate escalation rates, but escalation rate was not the way in which the numbers were derived. Specific prices of fuels are identified for future years rather than merely extrapolation, which would be what an escalation rate does.

Q. And comparing the 1982 price for residual oil with the 1990 price, I noticed in that case you used 1982 dollars for both of those numbers, is that correct?

A. That is correct.

Q. And for residual oil in 1982, you started $31.00 a barrel in 1982 and rising to $48.00 a barrel in 1990. At 1982 dollars.

A. That's right.

Q. Would you agree that that contains a substantial real escalation rate over and above the inflation rate?

A. That is correct. We believe that's the most realistic way to estimate future prices of commodities, to identify causes of real price increases such as need to drill deeper wells, depletion of oil fields which were developed using, at a low capital cost in years past and the need to develop newer resources. That accounts for a real

price increase and that is superimposed on any general inflation.

Q. Do you know what your analysis implies would be the price for residual oil in 1982 dollars in the year 1985?

A. I don't have the number. We can provide it.

Q. If you could provide that.

A. Sure.

Q. Have you reviewed recent projections by economists concerning what oil prices are projected to be, for example, by DRI, as to what oil prices are expected to be in 1985?

A. We review long term and short term price forecasts for fuels and many other commodities on an ongoing basis. We have noted in the past that the price forecast provided by consultants such as DRI, especially DRI, tend to be rather volatile. That is to say that every three months or six months DRI will come out with a new price forecast for 1990 which can vary by as much as 10, 20, 30, 50 percent in DRI's outlook for 1990 from one forecast to the next.

Q. Am I correct, though, that you have relied on DRI for your inflation rates that you utilized in your WFH-3 analysis?

A. Our inflation rates are consistent with the inflation rates contained in the load forecast which is, in part, an econometric projection and Mr. Beamer has testified to that.

Q. Could you refer to the response to 200.282080, which is another one of the interrogatory answers that I handed you.

A. Yes.

Q. Does that not state that the forecasted inflation rate as shown on figure 10 of WFH-3 were obtained from Data Resources, Inc.?

A. That's correct.

Q. Now, do you know what Data Resources, Inc. is projecting now to be the price of oil, for example, in 1985 and do you know whether that's consistent with your analysis in WFH-3?

A. I don't have with me DRI's most recent forecast. We did provide, in response to an interrogatory, PP&L's long range fossil fuel price projections and you will note from that that PP&L's projection for 1990 was compared with a number of other projections, U. S. Department of Energy, DRI, I believe Chase Econometrics and Warden. I am not sure what all of the others were. There were about four or five of them. PP&L's projection for 1990 was the lowest of that group.

Q. When was that projection made?

A. April, 1982.

Q. Do you know whether oil prices and forecasts of oil prices have changed since April, 1982?

A. As I stated earlier, oil price projections by consultants tend to change rather rapidly. Perhaps they are trying to sell forecasts.

Q. Do you know whether they have changed since April, 1982 generally in a consistently downward direction?

A. If you look at a longer period of time than one year, you will see that the forecasts have changed up and down and in the past year they have gone down from the consultants' and PP&L's forecasts have tended to be more stable.

During the period of 1978, 1980, and '81 when people were projecting very, very rapid price increases in oil, PP&L showed the lowest forecast for the price of oil. Now, the consultants have tended to swing very hard in the other direction and we have tended to be more stable, tended to hold the middle ground.

We can provide more information on a comparison of PP&L's forecasts with the forecasts of other consultants.

Q. I am mostly concerned with the comparison of your forecasts from April, 1982 with more current forecasts of oil prices, if you have them available?

A. We can provide that.

Q. Am I correct that when you did a sensitivity run for lower oil prices, what you did was reduce the escalation rate by 20 percent, is that correct?

A. That's correct.

Q. So that even if, in your contingency analysis, by reducing the escalation rate by 20 percent, you still show a significant real increase in oil prices over the life of your analysis, over and above the inflation rate, is that correct?

A. That's correct.

Q. You did not do a contingency analysis which showed, for example, oil prices rising only at the same rate as inflation?

A. We do not believe it's realistic even as a low ban to show no real price increase in oil.

Q. No real price increase in oil?

A. No real price increase in oil. It's just inconsistent. That could only happen with no oil consumption. As oil is consumed and existing oil fields are depleted, those low embedded cost oil fields have to be retired and new oil fields developed or tertiary recovery processes put in place which are real price increases.

Q. Is that unrealistic in the short term, let's say between now and 1985, to assume no real increase from what you projected in 1982?

A. I am not sure I can comment on the short term. I believe Mr. Scheffley indicated that he can provide data on the short term. Short term price changes can be influenced

by a variety of factors.

MR. POPOWSKY: Could I have a moment, Your Honor.

(Brief pause.)

BY MR. POPOWSKY:

Q. Am I correct -- and I believe Mr. Scheffley might have covered this -- but at least in the immediate term, Susquehanna displaces more coal than oil on the PP&L systems?

A. In the immediate term I would have to defer to Mr. Scheffley. We could check that.

Q. I think that was his statement.

MR. YOUNG: I think the record will show what he testified at great length yesterday on that subject.

BY MR. POPOWSKY:

Q. Do you know in the long term whether Susquehanna displaces more coal than oil?

A. We developed our analysis in terms of dollars rather than in terms of physical quantities of fuel, but that could be developed and provided.

Q. I think we have the dollar amounts. I don't want to ask you to do that. I think we could do that if you haven't already.

Q. You assumed a real escalation in coal and oil prices. Did you assume any real escalation in the annual cost of O & M for Susquehanna?

A. Mr. Kenyon will testify on O & M costs at

Susquehanna and I think he's in a better position to give you good information.

Q. For purposes of your analysis, then, you just accepted Mr. Kenyon's projections?

A. I think he will show that they were more than projections in the extrapolative sense. We accepted his information as operator of the plant.

Q. Do you personally know what the real rate of escalation in nuclear O & M costs have been over the past ten years?

A. No, I don't.

Q. Do you know whether there has been a substantial real rate of escalation in nuclear O & M costs?

A. Once again, I think Mr. Kenyon can testify to that.

Q. In your sensitivity run for lower load growth, you reduced PP&L's peak load growths from 1.8 to .8 percent with similar reductions in the PJM peak load, is that correct?

A. That's correct. That made it, once again, understated the benefits of Susquehanna. If PP&L's load growth were to be lower than base forecasts but PJM's load had not been reduced by a similar amount, the benefits of Susquehanna, again, would be larger than we have shown in our base analysis.

Q. Or vice versa, is that correct? I mean what would happen if PP&L's -- if PJM's reduction were greater than

PP&L's?

A. Well, I think we have taken the most conservative approach in understating the benefits of Susquehanna by assuming a reduction in the load growth in both entities.

Q. What energy growth reductions have you projected as part of this contingency analysis?

A. I believe I would like to check on that rather than answer that right at the moment.

Q. If you could provide that to us.

A. Yes. We can provide that, sure.

Q. What effect, if any, would the lower actual peak that occurred in 1982 have on your analysis?

A. I am sorry. Can you repeat that?

Q. What effect, if any, would the lower than projected actual winter peak in 1982 have on your analysis?

A. None. Our analysis is dependent on loads subsequent to 1982 winter peak.

Q. Would you agree that in order to get to a 1985 peak load of 4990 megawatts, for example, that the actual -- that you will have to have a higher than 1.8 percent peak growth rate between now and 1985?

A. I believe Mr. Beamer has already testified to load forecasting and I think he would be the --

Q. Well, just as matter of arithmetic, if we start in 1982 with a lower peak load, that is lower than you had

projected by approximately 400 megawatts and then we normalize for weather conditions, just assume there is still a shortfall between actual and projected, would you agree that as a matter of arithmetics, in order to get to where you projected load in 1985, PP&L's load growth peak load will have to be higher than 1.8 percent?

A. We assume all those things, that's true. I would have to point out the 1.8 percent is an average annual combined growth over a long period of time. It was not applied on an each year basis.

Q. With that correction, whatever the number would have to be, it would have to be any higher?

A. I think that arithmetic is easily done from the numbers on interrogatory 200.282066.

Q. Thank you. In your initial analysis on WFH-3, you presented contingency analyses with three contingencies we have discussed separately. In response to an OCA interrogatory -- and it's been identified as 200.282099 -- am I correct that when those three contingencies are combined, Susquehanna shows no net benefit to ratepayers, even on account dollar basis until the year 2001.

A. The bare arithmetic shows that that is all, that is some arithmetic. If we were to assume -- it assumes, that is to say, that there is no interrelationship between each of those pessimistic assumptions and when in fact, there is.

For example, if there is -- if there were, by any chance, a lower rate of increase in the price of oil for some period of time, one would expect that to be a stimulus to the economy and industrial activity to be greater and industrial loads to grow, so it's very difficult to see a world in which you would have both low fuel prices and low load growth.

In order to do that kind of analysis properly, I would do several things. First of all, I would recalculate a load forecast or have one developed consistent with a world with lower fuel prices, lower fossil fuel prices. And then I would attempt to assign some probability to each of those events occurring individually and then develop a composite or conditional probability of the combination of all of those events.

I think you would find that Susquehanna would not be as uneconomical as that bare arithmetic shows because load growth would be higher if you had lower fuel prices and would have a very low probability of occurrence.

Q. When you refer to low fuel prices, your description of low fuel prices only refers to as a real escalation rate from present fuel prices for oil and coal which is 20 percent lower than the escalation rate which you have proposed. Is that correct?

A. You are not suggesting that in your analysis --

A. Yes, my point --

Q. -- let me finish -- that you have suggested either a continuation of present fuel prices or an escalation solely based on inflation?

A. Yes. But my point is that the load forecast which was used in the analysis, was developed specifically consistent with the fuel price forecasts.

Q. Could you state in the long term -- this was discussed with Mr. Scheffley for the test year, what level of sales you have assumed from utilities outside of PJM in terms of bilateral transactions to the other utilities within PJM?

A. We have assumed that the transmission system is fully loaded with sales from the outside. And that, again, is a fairly -- is a very conservative assumption. We have assumed 17,000 gigawatt hours a year through 1990 and 13 thousand gigawatt hours per year beyond 1990.

Indications are that that is the highest likely level, that that amount of energy will not continue to be available that long into the future and once again, where we had a choice to make on a projection in the future for the base analysis, not just looking at the pessimistic analyses, but for the base analysis, we chose the assumptions which would tend to understate the value of Susquehanna.

Q. With regard to the buy-back of capacity and energy

from Allegheny Electric, am I correct the company initially sold a 10 percent ownership of Susquehanna to Allegheny Electric?

A. No. A buy-back arrangement was a part of the original agreement developed.

Q. That was part of the original contract?

A. Yes, it was.

Q. And why was that buy back necessary?

A. Allegheny Electric, in their projections at that time, felt that it would be in their customers' interest to own 10 percent of Susquehanna. That was their determination. And from PP&L's point of view, it was useful to have a partner for 10 percent to ease in the capital financing burden of Susquehanna during its construction.

Our evaluations at that period did, however, show that if we could manage the financing, that in the long term, it was in our customers' interest to in fact retain that 10 percent and not enter into an agreement with Allegheny. So there was a judgment balance. And the judgment balance was that we would be advantaged through the financing process to have a partner for 10 percent.

Allegheny's load, however, at that time was not sufficient to use all 10 percent output of Susquehanna and so they suggested a buy-back arrangement in which they would own 10 percent but we would buy back from Allegheny in

decreasing amounts, certain amounts, a fraction of their 10 percent until their own load grew to the point where they could use all 10 percent of a plant.

It was necessary to enter into that buy-back arrangement in order to obtain a ten -- for Allegheny to be able to manage a 10 percent ownership. On balance, the combination of those two things represented an agreement which we felt was in our customers' interest.

Q. Am I correct that that results in PP&L buying back portions of Susquehanna at the very time when your analysis shows that that capacity is least economical?

A. It does, but the only alternative open to us was to own all of it rather than, as our analysis now shows, reflect a several percentage sale, net sale to Allegheny. The alternative would have been zero.

Q. Was the buy-back -- when you say it was part of the original contract, was that contingent on any other factors occurring or was the amount in terms of the buy-back specifically set out in the original contract?

A. It was specifically set out.

Q. It was not contingent on any other --

A. It's a rather lengthy agreement but to my knowledge, subject to check, it was spelled out in the original agreement.

Q. We don't have to do it on the record, but if we

could perhaps briefly review the contract at some later time so we could review that provision. I could perhaps do it with Mr. Caliendo.

MR. CALIENDO: Sure.

BY MR. POPOWSKY:

Q. Just actually one last question. There was some questioning, I believe, by the Susquehanna Alliance of Mr. Curtis of whether the company considered cancelling either or both of the Susquehanna units.

My question for you is whether PP&L considered joining with, at any time early in the planning process, or construction process, did PP&L consider joining with PECO in the ownership and construction of the Limerick units or PSE&G with respect to the ownership of the Hope Creek units and either deferring or cancelling one or another set of those units?

A. Cancellation, not to my knowledge, not with regard to cancellation of the units, no.

Q. What about with regard to joint ownership -- am I correct that those six units are all large boiling water reactors all on the PJM system?

A. That's right.

Q. Did the company ever consider joint ownership in construction with either PECO or PSE&G of one or another sets of those units in order to alleviate possible

over-capacity problems in the future?

A. To my knowledge, if there was any such discussion, it was very early in the game and I am not familiar with it.

Q. Do you have an opinion as to why, within your knowledge, there was not such discussion in your tenure, in your position at PP&L?

A. I think there may have been a number of reasons for that. For one thing, we felt the construction at Susquehanna was, relative to many other nuclear problems, was proceeding very well and we were developing an engineering and construction team and an operating team that gave us reason to believe that we could operate Susquehanna, get it in service sooner at lower cost and provide those benefits to customers sooner than if we were to enter into some joint arrangement.

That would be my explanation. When you say consider, I don't think there were ever any serious considerations. There were lots of alternatives among the PJM companies, that have been discussed over many decades regarding sharing capacity of various sorts.

Q. And am I correct Hope Creek 2 Unit has now been canceled, is that correct?

A. That is my understanding.

MR. POPOWSKY: Could I just have a moment, Your Honor

(Pause)

MR. POPOWSKY: That's all the questions I have. Thank you, Mr. Hecht.

THE WITNESS: Thank you.

JUDGE KLOVEKORN: Off the record.

(Discussion off the record.)

JUDGE KLOVEKORN: Let's adjourn now and come back at 1:20.

(Whereupon, at 12:20 p.m., the hearing recessed, to reconvene at 1:20 p.m., the same day.)

AFTERNOON SESSION

JUDGE KLOVEKORN: Let's go back on the record.

MR. POPOWSKY: Your Honor, could I just state that we will move all of our exhibits into the record at the close of the case, if that's satisfactory. I will not move the exhibits I identified today at this time unless the company has a strong preference.

MR. YOUNG: That's up to you. You might forget them.

MR. POPOWSKY: We'll identify them at this time and move them in at the close of the case.

JUDGE KLOVEKORN: Proceed.

BY MR. EATON:

Q. Mr. Hecht, my name is Jackson Eaton. I represent some light industry and commercial users. I think my questions are going to be limited to a clarification of a

few items in your testimony and exhibits. I think we have submitted some data requests or questions on this which we haven't received back yet and I am hoping we can run through some of this quickly.

With regard to your Exhibit 3, and particularly figure 2, we would like to focus on capital related costs which are broken out in that figure.

A. Yes.

Q. You show a return on investment in 1983 as $113 million. Is that correct?

A. That's correct.

Q. And this return was computed only for Unit 1 and you assume that enters service on May 15, 1983, is that correct?

A. That's correct.

Q. The rate of return was 12.63 percent?

A. That's correct.

Q. And finally on figure 10, where you show your assumptions you indicate construction costs of Unit 1 of one thousand 860 million dollars (sic).

A. That's correct.

Q. We are trying to run through the manner in which you have calculated your return there and we are reaching a different figure. I think maybe the easiest thing is we will go over what we did. I think it's very brief. If you

can indicate perhaps how that is incorrect in reaching figures you reached?

A. We can try. It might be better to be handled in written form. We can give you a written reconciliation of the data in my exhibit or we can sit down across a table and check data. It might be more productive than in this environment. We can try it.

Q. Let me try to run through this one quickly and if at the conclusion of the question you feel that still is the best way, then we will try to move on.

A. Okay, fine.

Q. This is necessary for the testimony we may be presenting in response.

A. Okay.

Q. First, since the unit goes into operation on May 15, 1983, it is earning a return for seven and a half months, is that correct?

A. Correct.

Q. Or an adjusted 1983 return of 7.89 percent, subject to check?

A. Subject to check, taking that fractional part of the year.

Q. As part of the year. All right.

A. Yes.

Q. And applying this return to the capital costs of

$1,860,000,000.00 less $800 million in depreciation or 8 million in depreciation, excuse me.

A. Okay. Before we do that. The 1,860,000,000 is 100 percent of the plant and PP&L owns 90 percent of the plant.

Q. I think that accounts for the --

A. There may be some other small changes or refinements.

Q. I think that accounts for the substance of it. And that would take care of the next three.

A. All right.

Q. Turning to the calculation of the taxes on figure 2 of Exhibit WFH-3, am I correct that these calculations include effects of 1981 and 1982 Federal tax legislation as you state on figure 10 of the same exhibit?

A. That's right.

Q. Are you the competent witness to explain these tax calculations at least in general terms?

A. In very general terms. Otherwise, Mr. Vanderslice or Mr. Bernini.

Q. Why are the taxes so much lower relative to return in initial years in 1982 and so much higher in later years?

A. Investment Tax Credit? Could that be an explanation? Can we go off the record and we can confer.

MR. EATON: Why don't we go off the record for a minute.

(Discussion off the record.)

MR. EATON: In response to the last question, the witness is going to provide the work papers which will show those calculations, is that correct?

THE WITNESS: Certainly.

BY MR. EATON:

Q. And finally, just some questions with regard to modified sinking fund. On figure 2, those figures show PP&L's recommended modified sinking fund depreciation expense, is that correct?

A. That's correct.

Q. And I take it you have reviewed Mr. Beamer's testimony in this proceeding and I ask you specifically if you are aware that on page 6 of Exhibit JOB-3, Mr. Beamer shows an annual recovery under the modified sinking fund which appears to increase at a much lower rate than those increases in depreciation expenses shown on figure 2 of your exhibit. I ask you if you can reconcile those differences?

A. We can try to reconcile them now. If not, once again we will provide a written reply.

Q. It appears though one includes both units and one has only --

A. Figure 2 includes both units in my testimony. And if I am interpreting correctly what you have handed me which I believe is page 6 from JOB-3 --

Q. Yes.

A. -- I believe that's one unit.

Q. Okay.

A. That's -- if I am mistaken on that, we will provide you with a written reconciliation which does correct it. But my initial analysis of this is that JOB-3 is for one unit and figure 2 and in fact all of Exhibit WFH-3 is on a plant basis.

Q. Can you provide us with a reconciliation of those two figures?

A. Sure.

Q. If the Commission were to reject PP&L's modified sinking fund method for depreciating Susquehanna, the costs supplied of your net savings calculation on figure 8 of WFH-3 would increase and thus the negative net savings as shown on that exhibit would also increase, is that correct?

A. If we were to not use modified sinking fund depreciation, we would have greater depreciation expense in the early years and lower depreciation expense in the later years. Now, your question, I think, calls for a quantitative answer and I -- which I couldn't provide without doing some work.

Q. But negative net savings in the early years would be increased.

A. That's correct.

Q. The negative figure would be greater?

A. In the early years, that's correct.

Q. Is it true that for the test year in this case, Mr. Beamer's estimate and not the depreciation estimate shown on your exhibit, is PP&L's actual depreciation claim in this proceeding?

A. That's correct. My exhibit deals with economic effects over time. Not a detailed number for any particular year.

Q. Okay. And would you agree, then, subject to check that the charge is 14,821,100 as shown on page 6 of JOB-1 rather than the 8 million shown on your exhibit?

A. That's correct. JOB-1 is the proper testimony for depreciation.

MR. YOUNG: I might also note that JOB-1 is for a full year.

MR. EATON: Pardon? I didn't hear that.

MR. YOUNG: JOB-1 is for a full year since Mr. Beamer was testifying about an annual depreciation charge, not seven and a half months.

BY MR. EATON:

Q. Would PP&L show the same depreciation expense for book purposes as it reports earnings to stockholders or will it use a different method for book purpose reporting?

MR. YOUNG: Objection. This is not this witness' area,

Your Honor. We have been over that with prior witnesses.

MR. EATON: He's testified to the use of the system. I am trying to determine if there was a distinction between them.

MR. YOUNG: That was covered by Mr. Beamer in his cross. He's the appropriate witness.

JUDGE KLOVEKORN: Sustained.

BY MR. EATON:

Q. Can you justify the company's rationale or explain the company's rationale for charging different depreciation rates for book and ratemaking purposes?

MR. YOUNG: I object to the question. I think Mr. Beamer actually indicated they were substantially the same. I don't think this witness should be pursued with the same line of questions.

MR. EATON: If that's the -- will you accept that answer?

MR. YOUNG: I am objecting to the question. Mr. Beamer was asked that precise question in Allentown and he answered it. It's on the record. You don't need it again.

JUDGE KLOVEKORN: Objection sustained.

MR. EATON: No further questions.

JUDGE KLOVEKORN: Mr. Mann?

MR. MANN: Thank you, Your Honor. Good afternoon, Mr. Hecht.

BY MR. MANN:

Q. I have tried to weed out of my prepared cross what has already been covered. I just want to highlight a few points that, additional points. I have a general question. In calculating the reserve -- this is a question I asked Mr. Scheffley and it was deferred to you. When the PP&L obligation for the PJM grid is calculated, is that done to insure reliability of service for the entire grid or specifically to insure reliability for PP&L?

A. For the entire grid.

Q. For the entire grid?

A. And it's really the first level of reliability. That is to say it doesn't take into account transmission limitations, if any, and so forth. It's a very simplistic measure of total megawatts installed versus peak load.

Q. Then given -- would you feel that the capacity obligation to the grid is a minimal -- is a good approximation of the capacity needed for PP&L to meet, strictly to meet its requirements in terms of reliability, given PP&L's position in the grid? I am not sure that came out very clearly.

A. No, it didn't.

Q. Let me try that one again. The capacity obligation that is calculated for PP&L is really a high level of obligation if PP&L would only look at their own capacity

obligations since they are in a winter peaking grid? Is that true? In other words, if you maintain your obligation, that would be more than enough to insure reliable service to your customers since you do have a grid which has an even higher reserve capacity at that time?

A. No. PP&L's installed capacity obligation to PJM is the minimum necessary for PP&L to contribute its share to provide minimum reliability to the pool.

Q. To the pool?

A. To the pool. It's the minimum.

Q. Okay. But it would be -- your reserve would drop below the obligation calculated, is it your testimony, then, that you would have trouble providing reliable service?

A. We may. It would depend on the reserve situation of the other members of the pool.

Q. I am making the assumption that we are in a situation as we are now where in this past year, when PP&L had its winter peak or around the time PP&L had its winter peak that PP&L had an excess grid capacity of 72 percent as earlier stipulated?

A. I don't know that anyone stipulated to excess capacity. What I think you are driving at is if PP&L had less capacity than its capacity obligation to the pool, that we could still provide service to our customers by leaning on the pool, that is by depending on some other member of

the pool having more capacity than required for reliability.

That view would be in conflict with the contractual obligation of all members of the PJM pool. It would result in a much greater use of high fuel cost peaking capacity and a higher cost of service and it would be, in general, an irresponsible way of meeting our obligation to serve.

Q. Let's deal strictly with maintaining the reserve obligation of the grid. Are you meeting your contractual obligations and providing service to your customers?

A. Can you repeat that?

Q. If we assume you maintain a reserve capacity equal to that calculated as your obligation for the grid, you are then fulfilling your contractual obligations and you would be capable of providing reliable service to your customers?

A. That's a compound question. Two parts. We would be fulfilling our obligation to the grid, to the pool. We would not necessarily be able to provide reliable service to our customers.

Providing reliable service to our customers depends on all members meeting their installed capacity obligation to the pool and depends upon the kinds of capacity that are installed being able to follow load as load changes from hour to hour, being able to startup and when called upon, and would also depend on transmission system and a number of other factors. So PP&L meeting its installed capacity

obligation to the pool is a necessary but not sufficient condition for reliable service.

Q. Presuming the obligation for all utilities takes all those factors into account and the other companies are in fact meeting their obligations, all other things being equal, then it is a fair judge of the reserve necessary to meet reliable service criteria, is that not true?

A. Subject to all the qualifications in my answer to the previous question.

Q. Which would be included in the capacity obligations to all the utilities?

A. No, they are not. As I stated. The installed capacity obligation to the pool for PP&L is a necessary, but not sufficient condition for reliable service to our customers.

Reliable service to customers depends on having capacity which has operating characteristics capable of increasing and decreasing output to follow customer load. It depends upon all members of the pool meeting their installed capacity obligation.

It depends upon a reliable fuel supply to all of that capacity and it depends upon the transmission system, among other things. So PP&L's installed capacity obligation to the pool is one measure, one facet of reliable service to customers.

Q. Many of the factors you mentioned, such as the capability of the plants to follow load and so forth, aren't those, in fact considered in calculating the obligation for each of the companies?

A. No. These are operating characteristics. What I described earlier, I believe, the factors included, I believe yesterday afternoon, the factors included in the calculation of the installed capacity requirement for the pool.

The installed capacity obligation of each member that's described in detail in the supplemental agreement which was submitted in response to an interrogatory, supplemental agreement to the PJM agreement, that is.

The primary factors included there are the load of each company and its variation over time, over a year. It's hour by hour, day by day, week by week variation. The total megawatts of installed capacity, the number of units, the size of those units and the availability of those units, both planned outages for maintenance and forced outages.

Those are the factors primarily considered in the installed capacity requirement for the pool and obligation for each member. It does not include the operating characteristics of the unit, its ability to startup, its ability to shut down, its ability to follow load, ability to increase output rapidly in response to changing customer

demands.

It does not take into account any internal transmission constraints within PJM. They may limit a large part of their earnings in one portion of the pool with capacity to another portion of the pool with load, et cetera.

Q. I think that clarifies it a little bit for me. In response to an interrogatory submitted by Susquehanna Alliance, response was labeled 200.582029, one of the attachments to that response is an analysis of the costs and benefits of the Susquehanna Steam Electric Station for its first ten years of operation. It's dated December 14, 1981. Are you familiar with that report?

A. I don't have a copy in front of me. If I could have a copy --

Q. I just have a very general question. The general question is why was a ten year analysis chosen for purposes of this report when your testimony submitted, for purposes of the rate case you chose a 20 year period of analysis?

A. In that report, that was one of a series of ongoing studies, examinations and some general evaluations of Susquehanna which took place throughout the construction process of the plant. And they were used for internal decision making.

It wasn't necessary or useful or didn't shed any more light on the subject to carry the analysis out beyond ten

years.

For purposes of this testimony, we provided a more complete evaluation and went out further than that for a longer time horizon. It was merely time constraints and application of resources that indicated, dictated that that particular report was a ten year horizon.

Q. What purposes was this study then put to use for within the company? Was this ever released to the public?

A. I don't know if it was or was not released to the public. Many of our documents are given to outside agencies and for various purposes. That was its purpose.

The reason it was developed was internal re-evaluation of the Susquehanna project and one of a series of studies which took place throughout the life of the project to determine if it made sense to continue with the project and if it did make sense, to continue with the project, if it made sense to continue with the project on the current timing or if greater benefits would accrue to customers with a delay.

As our response to the interrogatory that you mentioned shows, those studies consistently showed that not only should the plant continue and construction continue rather, and not be canceled, greater benefits would accrue to the customers to get the plant in service as soon as possible.

Q. The December 14, 1981 study is, in fact, an update of an earlier study, is that true?

A. It was one of a whole series of studies which were provided in that interrogatory.

Q. But in the response to interrogatory, you only indicated one other study which took a look at the analysis of the cost and benefits of the Susquehanna Steam Electric Station as compared to not having a steam electric station.

Is it true that the other studies refer strictly to deferral of the in-service date?

A. I would have to look at the whole series of studies. I guess if I understand your question, Dave, I would disagree. I think there were a series of studies that dealt with related questions.

Related questions were should we continue with Susquehanna. Should we continue on the current schedule or delay? And there were five or six studies that were submitted in response to the interrogatory and going back to 1975 and throughout the life of the project, it shows that considerations of cancellation were not in the customer's interest at all and that in fact, completion of the plant just as soon as possible would provide the lowest cost of service over time.

Q. Well, in response to the interrogatory, which specifically requested all studies and reports prepared from

1973 to 1982 which examine the expected economic benefits of the Susquehanna plants, I presume that what I have been provided with is all those studies, is that true?

A. Oh, yes.

Q. If I read through the titles, I don't know if that's necessary, but if you would like me to, I will. It appears to me that there's really only -- most of these studies deal with the calculation of the costs of deferral of the in-service date of the Susquehanna units and that only the study I referred to and the one which came out prior to that which I was not provided a copy of dated February 26, 1981, actually dealt with an analysis of the costs and benefits versus not completing the units.

A. Well, I think --

MR. YOUNG: I think the witness has already answered the question once. He said all of those studies dealt around the same kind of subject matter.

MR. MANN: I am specifically addressing the issue of the costs and benefits of the Susquehanna station versus no Susquehanna Station.

THE WITNESS: Well, our reviews indicated that if it was uneconomical to delay the plant one year, it was even more -- qualitatively, one could immediately conclude without much further analysis, without even studying something, that a delay of two years was even worse, and

that a cancellation was the worst alternative, and that no Susquehanna Station was more costly than constructing Susquehanna.

BY MR.MANN:

Q. Could you explain to me how deferral, which increases the completion costs of the plant, can be used to infer that cancellation will be even more expensive when there are lesser costs involved in cancellation than in deferral?

A. I think I have answered that but we can try it again. All of these studies were done on a revenue requirements basis. That is we are attempting to minimize the total cost of providing service to customers.

If the plant were not completed at all, we have the sunk cost to recover and no energy benefits at all.

Furthermore, when new capacity would be required for a load, that capacity would have to be constructed at an inflated cost and a cost much in excess of the cost of delaying Susquehanna.

Q. So a basic assumption in what you are saying is that at all times you were assuming you would need the plants at some point?

A. That wasn't an assumption. That was a derived conclusion, a demonstrated conclusion that some capacity was, in fact, necessary.

Q. Well, it's a conclusion based on your projections, is that not true?

A. That is all anyone can do with the future.

Q. Okay.

A. We make the best decisions we can at the time.

Q. But the first time you actually produced a study which looked at the costs and benefits of the Susquehanna Steam Electric Stations as compared to not having those plants produce the numbers that compared those two was in February 26, 1981, is that not true?

A. No. I don't agree.

Q. Then could you point to me in which of these other studies those calculations are done?

MR. YOUNG: I object. That's a repetition of the question that's now been asked twice. I think the counsel is simply arguing with the witness. That's not going to get us anywhere.

MR. MANN: I am not re-asking the question. I am asking Mr. Hecht to indicate where in the studies those numbers are provided.

JUDGE KLOVEKORN: Answer the question, please.

THE WITNESS: Okay. If we go back to the -- let's take the exhibits one at a time. The testimony prepared for the operating license described the economic benefits of Susquehanna compared with no Susquehanna.

The material submitted with the economic -- with the construction permit application -- and I don't have the date of that in front of me -- that was in the early '70's. That also showed the costs and benefits to customers, if I am not mistaken.

BY MR. MANN:

Q. Let's go back to the first one. I am specifically looking for where in these studies those numbers are. I am unable to find them. I am asking you to show me where these numbers are in these studies?

A. Let's see if I have a copy in the testimony.

MR. YOUNG: If this questioner wanted this, he could have sat down with the witness at any occasion. I don't think he should take the time of this whole group for his education on the subject. To a large extent, none of this is relevant to this case, anyway.

MR.MANN: I am willing to defer the question if I am allowed the opportunity, if necessary, to recall the witness. We just received the answers to the interrogatories. A couple of these studies are still in transit. Some of them I got just on Saturday, I believe and there was no opportunity to sit down with Mr. Hecht.

I would be perfectly willing to defer these questions and sit down with Mr. Hecht to look at these numbers but I would ask that I be allowed to recall the witness, if

necessary, to establish on the record what I've been asking.

MR. YOUNG: The studies speak for themselves. You can introduce them into evidence once you get them, if you want. There is no need to drag the same information out of a witness that's already in a document that you can introduce.

JUDGE KLOVEKORN: Do you think we have a problem in having Mr. Hecht come back, if necessary?

MR. YOUNG: I am sure he can appear on some other occasion.

JUDGE KLOVEKORN: I think probably the most expeditious manner to proceed would be to have Mr. Mann and Mr. Hecht sit down and go through these documents.

MR. MANN: Thank you, Your Honor.

BY MR. MANN:

Q. Mr. Hecht, there was some testimony this morning or some discussion this morning, I should say, about whether or not a current value or some present value calculation should be used to determine the economic benefits of a plant. In your response to OCA interrogatory Number 200.282070, there was a study which looked at the possibility, I believe, of deferral of the Martin's Creek units.

Excuse me a second, Your Honor. Attachment 5 was a study which looked at change in consumer costs for deferral of Susquehanna 1 and 2 and Martin's Creek 4. In that analysis, is it not true that you used a present value

analysis?

A. I don't have that in front of me. That may have been.

Q. Would it be helpful if I showed it to you or does your counsel have it?

MR. RUSSELL: Would it be 070?

MR. MANN: 070, attachment 5. If you look on the third page of that document, as an example of where this is referred to. Do you have it yet?

THE WITNESS: Okay. You are -- the number is 070.

MR. MANN: 282070. Attachment 5.

THE WITNESS: I have it.

BY MR. MANN:

Q. On the third page of that document there's just a brief three lines at the top and the last line indicates a total cost increase equivalent to $13 million, 1977 present worth dollars. There are also other references throughout the document that refer to present worth?

A. That's correct.

Q. So that this analysis of consumer costs was done in terms of a present worth value?

A. That's correct.

Q. In that same interrogatory, attachment 4, which is a study that was done in 1977, October of 1977, there was a study of the effect of deferral of completion of the

Susquehanna Nuclear Plant beyond the presently scheduled point.

It's my understanding from reading this, this is not done in present value. This is done in using current value. Is that your understanding?

A. Yes. That was attachment what, now?

Q. Four.

A. Attachment 4, yes.

Q. Right. Without going through each one of them, subject to check, would you agree that documents created subsequent to that which have been provided in response to interrogatories of both the Susquehanna Alliance and OCA, have also been done using current dollars?

A. Subject to check. I couldn't be sure. As I indicated this morning, there are a wide variety of philosophies regarding whether or not one should present value customer revenue requirements and if one does, what the discount rate might be that a customer might consider appropriate for his costs as opposed to a discount rate that a corporation would consider appropriate as their after tax cost of money.

So you will find throughout this family of studies which were conducted during the course of construction of Susquehanna, both kinds of treatments to give an overview or a cross section of the possible effects on customer costs in

Susquehanna.

Q. But in terms of when the studies were released, the study done in 1975 uses present value calculation and the subsequent studies do not, at least according to the studies that have been submitted?

A. I don't think that's generally true. It may be true of the formal studies which have been submitted. I don't think that is generally true for all analyses conducted subsequent to a certain year did not present value and all those prior to a certain year did.

I can't agree with that. There was no particular change in philosophy at that point that suggested that present value was appropriate before and not appropriate after.

Q. Is there any -- there is a decision made at the time each of these studies are presented as to whether or not to use current or some present value?

A. Well, there is, and that decision is usually based or is always based on the degree of amount of time available to conduct the study and just how clearcut the results are, based on early analysis.

These were, in most cases, with the exception of those studies submitted that were part of testimony for operating license or construction license, for example, were internal decision making studies. The study was terminated when an

answer became clear rather than to devote indefinite resources to study work for internal decision making.

Q. When you said the answer became clear, if you are analyzing the costs to consumers, isn't it a function partly of whether or not you use a current value or present value?

A. In part --

MR. YOUNG: It seems to me he already answered that this morning. I object.

MR. MANN: I'll withdraw the question.

BY MR. MANN:

Q. Mr. Hecht, in response to an interrogatory by the Susquehanna Alliance, we were supplied with a chart -- this is in response 200.582032, we were provided with a chart which took the analysis done in various tables in Mr. Hecht's Exhibit WFH-3 and also in response to interrogatories of the Consumer Advocate's Office which were done in current dollars and asked for those current items in what we termed uninflated dollars.

I would distinguish uninflated. He used the term in the interrogatories, present value, 1983 dollars.

A. Yes.

Q. I would presume for the purpose of these questions what might be a present value derived from some other discount rate as opposed to the inflation rate. But I believe the values given to us were using the inflation rate

as a discount rate. Is that true?

A. That's what your question was. We wouldn't normally, if present value is considered an appropriate way of judging cost to customers over time, we would not agree that inflation rate would be the proper discount rate, necessarily. Was that your question?

Q. I understand that. In response to the Consumer Advocate's Office, you indicated that an appropriate discount rate might be the company's weighted return on capital. Is that not true?

A. Can you repeat that?

Q. You indicated -- in response to Consumer Advocate's interrogatory as to an appropriate discount rate, you indicated that the weighted return on capital would be an appropriate discount rate?

A. We offered that as one alternative. I think, in my discussion this morning and in the remainder of my response to that interrogatory, I discussed the various opinions that are outstanding among experts on how -- whether or not present valuing for a customer who pays his electric bill out of current income is appropriate at all and if it is appropriate, the various philosophies that one might subscribe to on what the discount rate ought to be.

Q. I don't want to get into a discussion of what is a proper price as a discount rate at this time. I just --

A. I want to clarify the context in which we offered the company's weighted average cost of capital in response to that interrogatory.

Q. Okay. One moment.

BY MR.MANN:

Q. Mr. Hecht, I would like to hand you a table that we calculated. I am not submitting this as an exhibit. I just wanted to use it for reference. What we did here was we were trying to get a handle on what the impact to ratepayers might be if you did assume some discount rate as opposed to using current value.

We have taken the numbers as indicated on this chart, from your response to interrogatory 200.582032 and also to another interrogatory, 582033, and those numbers we then -- those numbers were provided to us using a discount rate of the inflation rates used in your analysis.

We then added those numbers up for a period of years to try and determine when the annual benefit would begin to occur. That would come right off the chart. What the net cost would be in ten years and when the net benefit would occur.

Subject to check of the arithmetic, would you agree that assuming a discount rate equal to the inflation rate, that in the base case provided in your analysis, that there would be no annual benefit until the seventh commercial year

which would be 1989, with the net cost to PP&L customers in the first ten years would be $789 million and that the net benefit, that is when the total savings outweigh the total costs would not occur until the 13th year, that is 1995.

A. I can't agree to any of this without checking. These are numbers that -- it's a sheet of numbers that I have no idea where they came from, if the methodology is logical or if the arithmetic is correct.

It's your exhibit, if you wish to make it one and you have to defend it and explain it. I am not sure what I can say about it.

Q. Let me ask you this. If you were to take, for example, on the attachment 1 to 200.582032 --

A. Attachment 1 to what?

Q. 200.582032.

A. Okay.

Q. On the side of the page which refers to uninflated 1983 dollars, column A which indicates below is the base case; would you agree from that chart that there is not an annual benefit to customers until the 7th year, that is 1989?

A. Yes. That's what that attachment shows.

Q. If I were to take that column of numbers and begin, negative numbers, I presume, indicate an annual cost to customers and the positive numbers indicate an annual savings to customers, is that true?

A. Yes.

Q. If I were to take that column of numbers and accumulate the negative numbers to generate the costs and then begin to subtract from that the annual savings until I got to zero or below, would I then arrive at the year in which the net benefit would occur?

MR. YOUNG: Mr. Mann, if you want to put this in the case and make those additions and subtractions you can do it in your brief -- I don't see why we should sit here making -- or do it through a witness of your own. I don't see why we should sit here making lengthy calculations for you. Not in this environment.

(Pause)

MR. MANN: Your Honor, I am willing to proceed. I think I can expedite this a little bit. I apologize for the delay. I am not familiar with all the procedures here. I am trying my best.

BY MR. MANN:

Q. Are you the sponsor of attachment 1 to 200.582032 and 200.582033?

A. I have to see those. I don't know.

Q. I thought you were just given those. Did I not give you one?

A. 582032 and what was the other?

Q. 582033.

Q. If we can just establish what this document shows, then, on the right-hand side of 582032 we have for uninflated 1983 dollars several columns which show the annual cost or benefit, depending on the year of the operation of the Susquehanna Steam Electric Stations based on various scenarios postulated in your exhibits and also in response to interrogatories, as indicated below, is that true?

A. Attachment 1 to 200.582032 is a direct response to your interrogatory question. It's no more nor less than that.

Q. Well, does it --

A. You asked the question in the interrogatory and that's exactly what it responds to.

Q. If, for each of the scenarios, if I were to take the, add up the total costs and/or benefits in each year for the first ten years for any given scenario would I then have the net costs or benefits to the customers in a ten year period?

MR. YOUNG: Under the assumptions that are posed?

MR. MANN: Yes.

THE WITNESS: Yes. That's simple arithmetic.

BY MR. MANN:

Q. And if I were to add up the costs in the early years followed by the benefits in the subsequent years until they netted out to zero or negative, I would then find the

year in which there was a net benefit that would begin to occur to ratepayers, is that true?

A. Under the assumptions you have posed, that may be true. I can't -- I am not sure what else I can say. I can't characterize data of yours in any other way.

Q. This is your data.

A. My data speaks for itself in tabular form. You are adding the numbers and purporting to show something else. I haven't done that and your interrogatory doesn't ask for that.

Q. Isn't the information you have submitted in your testimony, if you were to calculate when a net benefit would occur to customers under any scenario, how would you calculate it?

A. I think we show a year by year net benefit in our testimony.

Q. That's a net annual benefit. I am talking about a net benefit over time?

A. Cumulative net benefit?

Q. Yes. Over time.

A. I would algebraically add them.

Q. Until the sum would reach --

A. I would algebraically add them and that would show me the cumulative effects.

Q. If you wanted to find out in which year they would

start to accrue a net cumulative benefit?

A. I think I have answered that. I am really trying to answer your questions, David, but I --

MR. MANN: I feel like this is a fairly simple answer.

MR. YOUNG: If it's arithmetic, the witness can put it in his brief. I think we are wasting enormous time of a lot of people here to educate the questioner. With all due respect, I think this is an outrage.

MR. MANN: I have withdrawn the line of questions that deals with specific numbers. I am trying to determine the methodology so I can, in fact, put it in my brief.

MR. YOUNG: Call your own witness if you want to describe the methodology. There is no reason why this witness should subscribe to your numbers. They are your numbers. You make what you can out of them.

MR. POPOWSKY: I want to comment, certainly the standard should not be that parties such as the Susquehanna Alliance should have to call their own witnesses in order to get the company to agree to a conceptual methodology. I think Mr. Mann should be given some latitude to cross examine the witness --

MR. YOUNG: He's had about a half hour's latitude now. I think that's plenty.

MR. POPOWSKY: I also think there have often been objections to a use of making arithmetic calculations for

the first time in briefs. That's often raised a concern.

JUDGE KLOVEKORN: I don't think anybody has objected to the arithmetic in briefs, it is just where you see the numbers for the first time in briefs. Which reminds me, unless we get these numbers into the record somehow, I am going to throw out this whole line of questioning.

MR. MANN: Fine. Your Honor, I would like to move into the record the response to interrogatories PP&L numbers 200.582032 and 200.582033. I will provide full copies of those interrogatories to the Court Reporter and the Judge at an appropriate time. I believe the other parties have them.

MR. YOUNG: I don't think these should go into the record without the questions they are responsive to, since there's a major question as to whether the answers mean anything, in light of the fact that all they do is answer a question.

MR. MANN: I will supply the Court Reporter and the Judge with three copies.

JUDGE KLOVEKORN: Without objection, they will be received into evidence.

(PP&L Exhibit No. 200.582032, Response to Interrogatories of Susquehanna Alliance, Set III, dated February 6, 1983, was produced and marked for identification.)

(PP&L Exhibit No. 200.582033, Response to Interrogatories of Susquehanna Alliance, Set III, dated February 6, 1983, was produced and marked for identification.)

BY MR. MANN:

Q. Mr. Hecht, in your testimony for this case, you used -- I believe you testified previously you used a 70 percent capacity factor after the first four years for the operation of Susquehanna Steam Electric Station, is that true?

A. That is correct.

Q. Are you aware of the historical data with respect to how well these plants operate?

A. To some extent. Mr. Koppe will testify on capacity factor.

Q. Yes, I understand.

A. In detail.

Q. Is it true for purposes of the studies we have been referring to that have been done which looked at the cost to consumers of the plant in terms of deferrals and/or cancellation that you have consistently used a 70 percent capacity factor after the first four years?

A. No. We have frequently and regularly looked at load capacity factor scenarios and in those load capacity factor scenarios, as I explained this morning, we took a conservative approach and showed a low capacity factor for Susquehanna but retained a high capacity factor for the other nuclear units on PJM, thereby understating the

benefits of Susquehanna.

Q. But for your base case and in the other studies I have referred to, you have used a 70 percent capacity factor, is true?

A. We covered that this morning.

Q. I am referring now not just to your testimony but to the other studies that have been supplied in response to interrogatories that looked at --

A. To the best of my recollection, the broad range of studies conducted over the life of the plant have either been at 70 percent mature capacity factor or about 70 percent.

Q. Do you feel that as a base case for analysis of the economic benefits, that it is good practice to use a number which is not supported historically?

A. I think that Mr. Koppe can testify to the capacity factor of 70 percent and I think that in general, our base case analysis or analyses in general, have consistently understated the benefits of Susquehanna, that where there was a choice to be made in an input parameter, we have consistently chosen the value which would understate the benefits of Susquehanna rather than overstate.

It's not our practice to inflate the benefits of Susquehanna so that someone else can deliberately, radically understate the benefits of Susquehanna and then invite some

third party to pick the middle. We have done an objective analysis and gone out of our way to understate the benefits of Susquehanna.

Q. I am not sure that was responsive to my question.

A. Well, then read back the question.

(The question was read by the reporter.)

THE WITNESS: My answer in part was that Mr. Koppe will testify to capacity factor.

BY MR. MANN:

Q. I am asking for your opinion as a planning manager who has done, over the years, various studies of the economic benefits of the Susquehanna Station, according to your own testimony. I am asking you if you feel, as the planning manager, it is wise? Would you choose to use a number in analysis for a base case that is not supported historically?

MR. YOUNG: I object to the question anyway. It hasn't been established that the 70 percent is not supported historically. Nor has it been established that the historical analyses which do or do not support that have anything to do with the situation for this company and therefore, I see no merit in the question.

MR. MANN: Your Honor, I don't believe I mentioned 70 percent in that question. It was a general question that I was asking about what was good planning practice. I am not

asking the witness to testify as to whether or not the 70 percent was, in fact supported historically

MR. YOUNG: I still object to the question. I think it clearly assumes that some amount is not historically and there's no basis for that assumption.

JUDGE KLOVEKORN: I'll overrule the objection.

THE WITNESS: There can be good reason to use data, capacity factor, just one example, that's not supported historically. There can be good reason developed to indicate that other numbers should be used and I think that's the thrust of Mr. Koppe's testimony.

There can be very good reason to use other numbers. History is not -- especially mere extrapolation of history is not always a good indicator of what to use in a study of the future.

MR. MANN: Thank you, Mr. Hecht.

BY MR. MANN:

Q. This morning under cross examination by the Consumer Advocate, we were talking about the risk of an outage at the Susquehanna Steam Electric Station in one of your analyses, one of the analyses of the company, and I believe you said at that time that the risk of an outage at the Susquehanna Steam Electric Station is no different than at other plants. Could you explain what you meant by that?

A. I don't know that I said the risk of an outage is

no different than at other plants. I may have said that who bears the costs of poor operation or the advantages of good operation is the same at Susquehanna as it is at other plants. I think that's what I may have said.

I might add that in the case of Susquehanna, PP&L is a participant in the insurance program, NEIL, Nuclear Electric Insurance Limited, which substantially moderates the risk of or the costs of possible poor operation at Susquehanna.

Q. Then you were not testifying as to whether or not the possibility of an outage was greater or less than at other plants?

A. No.

Q. Okay. Thank you. Mr. Hecht, on WFH 1, on page 3.9 which is the table of capacity requirements based on the previous projection of a 2.0 percent growth rate.

A. Yes.

Q. Actually I am not sure that that's the right page. There is a description of that chart in which you indicate that the growth rate is greater in the early years and smaller in the later years and it averages out to 2.0 percent, is that true?

A. Where was that description?

Q. I think the description may have been on --

A. I do agree, David, that the percentage growth of 2.0 percent in table 3.2 on page 3.6 of Exhibit WFH-1 is a

nominal growth rate, not a growth rate that's uniform each year.

Q. Thank you.

A. It's used as a label for a particular load forecast scenario.

Q. Thank you for your help. Would this also apply to the current forecasts of 1.8 percent in peak load growth?

A. Yes.

Q. Would that pattern also apply to the forecast of sales?

A. I think Mr. Beamer is the best witness for that. He is responsible for load forecasting and included in that is the relationship between peak load and energy, annual energy or sales.

Q. Well, is it in your analysis in WFH-3, you used a 2.1 percent sales rate of growth for sales, is that true?

A. I believe that would be shown on figure 10 of Exhibit WFH-3, and that indicates a nominal rate of growth or a average rate of growth, if you will, of 2.1 percent for energy, 1.8 peak load, yes.

Q. Do you have a copy of the "Profile" with you?

A. No, I don't.

Q. Could you be provided with one? Do you have a copy?

A. Yes.

Q. On page 24 of that exhibit, for about halfway down

the page, there is a percent change over a prior year's calculation of the millions of kilowatt-hours sold and there is one line which shows a total. Would you agree that for 1980 you are showing a zero percent change over the prior year?

A. I think the figures speak for themselves, yes.

Q. And for 1981, a 2.2 percent change?

A. I am sorry. You are on page 24 and you are where, now?

Q. Under the heading percent change over prior year, the last line which indicates the total.

A. Yes.

Q. Do you agree with the 1981 figure?

A. I agree with the figures that are shown in the "Profil yes.

Q. In the response to the interrogatory submitted for the record this morning by the Consumer Advocate 200.582027, which shows the 1982 values for that same line, there is a negative 3 percent change, is that true?

A. I don't have that interrogatory in front of me.

MR. YOUNG: Again, we are dealing with facts that are already in the record. We are just wasting everybody's time letting them in again.

MR. MANN: It seems to me, maybe I am wrong, but there's been a lot of cross examination, specific facts were

pointed to before a question was answered to verify if we are dealing with the same assumptions. That's what I am trying to do here.

MR. YOUNG: It is obvious from the whole set of answers this morning that a nominal rate of growth is a difference, then, from what you have in one or two years, which is what you are aiming at. You're going to get the same answer that was developed this morning.

MR. MANN: I think counsel may be anticipating the question and answering it for the witness.

BY MR. MANN:

Q. What I am getting at, Mr. Hecht, I think counsel has pointed out for you, is you are in fact projecting a 2.1 percent nominal growth and these figures indicate substantially less than that. Have these figures been taken into account in projecting the sales forecast?

A. Mr. Beamer is the witness on load forecasting.

Q. Were you involved in the consensus decision making when the forecast was created? Were you part of the team that created the consensus forecast?

A. I am not sure what you mean by consensus forecast.

Q. In Mr. Beamer's testimony, there are several ways of projecting sales analysis and one of those is the consensus forecasts in which several members of the company sat down, reviewed with the other members and made a

consensus decision.

A. I am sorry. I did not know what consensus forecast you were talking about. Yes. I was part of that process.

Q. Would you not have an opinion as to whether or not these -- would you not know whether these numbers were considered in creating that consensus forecast?

A. They were taken into account. To the extent that very recent history has any bearing at all on long term trends, they were taken into account. I might also add that the data that you are looking at in the "Profile" and in interrogatory 200.582027, the data are not weather normalized, I don't believe, so they can be misleading as raw data taken --

Q. They can be misleading in either direction, depending on the year?

A. That's right. In effect, they have relatively little bearing, being very short term numbers and not being weather normalized, had relatively little bearing on long term trends.

Q. Again, referring to that consensus process, which you were a part of, in Mr. Beamer's testimony, and specifically page 1 of JOB-4, I don't know if it's necessary. You can look at it. I can refer you to the fact that there was some consideration given to technological changes that would occur that would stimulate growth in the generation of

electricity in the general residential area. Are you familiar with that?

A. Very generally. I would have very little I could offer you on that particular subject. Mr. Beamer and Mr. McNair, perhaps would be good witnesses to give information on specifically the quantification of that affect.

Q. So it wasn't a specific function of that consensus group to discuss what those technological changes were?

A. No. The consensus group gets together periodically and each individual contributes information related to his field of knowledge and his field of specialty and exchange information.

Q. But that would be shared among the members, then, right?

A. Yes.

Q. But you did not have any personal knowledge as to what those technological changes were, is that what you are saying?

A. No, I would not.

Q. You testified this morning that you used an operation and maintenance expense that was provided to you by Mr. Kenyon in your analysis?

A. That's right.

Q. If those operation and maintenance expenses were to increase at a rate faster than those projected by Mr. Kenyon,

would that adversely affect the economic benefits to customers?

MR. YOUNG: We had that precise question answered this morning.

MR. POPOWSKY: I don't believe he asked that question.

MR. MANN: The reason I asked that, Your Honor, is I believe that precise question was asked.

MR. POPOWSKY: I deferred all those to Mr. Kenyon, but I did not ask Mr. Hecht what the effect of a higher rate would be on his analysis.

MR. YOUNG: That would be pretty obvious from all the testimony that has gone on. I am sure the ALJ understands. I don't know why we have to labor over all this.

JUDGE KLOVEKORN: Would you answer the question, please.

THE WITNESS: Yes.

MR. MANN: Thank you.

BY MR. MANN:

Q. I believe that most of the rest of my questions have to deal with the earlier line of questioning with reference to the studies that we were referring to that we are going to talk about so I would defer those for now and hopefully we can resolve those.

I would also note for the record that there is one outstanding interrogatory that we have submitted that we

have not yet received a response to. I don't anticipate the need to cross examine Mr. Hecht on that but should anything arise in that interrogatory when I do receive it, I also would wish to be able to recall Mr. Hecht to respond to those.

MR. YOUNG: If it's simply a factual matter as much as the other questions have been, I hope that you will simply give him another interrogatory so we don't have to go through this.

MR. MANN: I will. I have no further questions, Your Honor.

JUDGE KLOVEKORN: Thank you, Mr. Mann. Do any other counsel have any questions?

MS. ROSNER: Yes, Your Honor, I do. I am Norma Rosner, representing the Pennsylvania Industrial Coalition.

BY MS. ROSNER:

Q. I would like to turn your attention to page 23 of your testimony where you discuss the relative benefits of adopting a nuclear plant over a fossil fuel plant.

A. Page 23.

Q. Yes.

Q. You have concluded there that overall, a nuclear plant would be cheaper --

A. More economical.

Q. Largely because of the relatively lower operating

costs in time over a coal-fired plant. Is that correct?

A. That's right.

Q. Would you agree that the primary factor in your analysis that contributed to this conclusion would be the relative cost of fuel?

A. Yes. That's correct.

Q. If you carved out fuel from your operating and maintenance cost analysis, would you conclude that operating a nuclear plant versus a coal-fired plant was still more economical or cheaper to operate or would it be largely a wash?

A. I would -- we never analyzed the components in that particular manner. My initial reaction would be that it's likely that the O & M costs on a nuclear plant exclusive of fuel were as high or higher than those of a comparable fossil plant.

Q. Would you agree that operating a nuclear plant would cause certain costs to be incurred that were either not paralleled directly or not incurred at all on the coal-fired side.

For example, the decommissioning costs and waste disposal costs would be not related to any other O & M expense that you would incur on the coal-fired side?

A. To some extent that's true. Although waste disposal costs on a fossil plant are a subject of increasing

concern. Ash disposal, for example, and so forth.

Q. Did you conduct any analysis that would project those relative costs over time?

A. We compared nuclear and fossil costs in total.

Q. Would you agree that insurance costs on the nuclear plant would likely be higher than a coal-fired plant?

A. Yes.

Q. As to special equipment needs, for example, protective safety clothing and so forth, would you agree that nuclear plant costs would certainly be a wash, if not slightly higher than a coal-fired plant?

A. Conceivably yes, I think so.

Q. Do you have any opinion as to comparative labor costs?

A. Well, those would be included in general O & M and I think we have agreed that O & M other than fuel is likely to be higher, as high or higher for a nuclear plant than a comparable fossil facility.

Q. Did you, in your analysis, factor at all any cost incurrence for increased health compensation claims or other related benefits that you might have to pay out due do work related disabilities?

A. I think if they were included they would have been included in general O & M and Mr. Kenyon can address that.

Q. So in sum, what we are basically talking about is a

reliance on your projected fuel costs for fossil fuel when you conclude that operating expenses will be cheaper in the long term for nuclear?

A. In large part, that's true.

Q. Now, Mr. Popowsky has already gone over in great detail with you this morning your methodology and the studies you have relied upon in making those fossil fuel cost projections so I won't go over old ground with you.

I just wanted to establish that that is the the key and certainly it may be the only factor that led you to conclude that operating costs would be cheaper for nuclear?

A. That's right. The large attraction to nuclear power is that the capital costs, while higher than comparable fossil facility, the fuel related costs are lower. Fuel related costs are subject to price changes, inflation and escalation over the life of a facility.

Capital related costs, once the plant is built, are relatively fixed and therefore, once a nuclear plant is placed in service, to the extent that the larger portion of the costs are capital related, a nuclear plant tends to insulate consumers from the effects of inflation to a greater extent than does a fossil plant.

MS. ROSNER: Thank you very much. That is all I have, Your Honor.

JUDGE KLOVEKORN: Redirect?

MR. YOUNG: I just have a couple questions.

REDIRECT EXAMINATION

BY MR. YOUNG:

Q. Mr. Hecht, in some of your cross examination this morning with respect to efforts to sell the output from Susquehanna or in the one case, the efforts to sell to GPU all of the 10 percent share of all of your output, you were asked whether each of those efforts was made on substantially a full cost basis and there was at least some implication that you didn't consider or might have considered possibilities of such a sale without collection of full costs, fully distributed costs of the power that would be sold.

Were those things considered and what would have been the impact of proposing though sell for less than full cost?

A. Yes. They were considered. The basic reason agreement wasn't reached was that our analyses concluded that our customers would have a lower cost of service by PP&L retaining that capacity and operating it on economy interchange both within PJM and for sales outside PJM than by selling at full cost of service to another utility. So that we weren't concerned, so much with total megawatts of installed capacity but rather with minimizing customer costs.

MR. YOUNG: That's all I have.

JUDGE KLOVEKORN: Mr. Popowsky.

RECROSS EXAMINATION

BY MR. POPOWSKY:

Q. With regard to that answer, does that answer apply to sales of Susquehanna alone let's say over the next ten years?

A. Yes. The same fundamental principle applies, that it would be our objective that in any term sale of capacity, to have our customer revenue requirements be reduced as a result of such term sale.

Otherwise, all we would be doing would be changing our installed capacity in total megawatts without having any beneficial effect on customers.

Q. Are you saying, then, the Atlantic City Electric sale is not beneficial to PP&L ratepapers?

A. On the contrary. The Atlantic City sale is beneficial to customers and that is related to full cost of service of Susquehanna alone. The other sales we were talking about, that's to be contrasted with a sale of PP&L's average system, including a fraction of Susquehanna and a fraction of our embedded costs, very low capital costs, coal-fired equipment, for example.

Q. In contrast to that latter type of sale, a sale, for example, for a term of years of Susquehanna --

A. Yes.

Q. -- just looking at your analysis on WFH-3 if we

could somehow confine the sale to the years 1983 to 1989, would you agree that ratepayers would be better off if the same company could sell a portion of Susquehanna capacity and output at least for those years?

A. That is correct and that's why we find the Atlantic City arrangement to be beneficial.

Q. And would that be correct from the ratepayer's point of view, even if the company did not necessarily receive the full cost of service from a party other than its own ratepayers and if the entire sale were treated below the line, such as in the Salem sale?

A. I can't answer that with certainty. When you talk about selling it at less than full cost of service, that leaves a wide range of possible costs and possible accounting treatments of those costs and I couldn't judge just from that question whether our retail customers would be advantaged by that or not.

MR. POPOWSKY: That's all the questions I have.

JUDGE KLOVEKORN: Nothing further of Mr. Hecht, the witness is excused. Thank you very much, sir. Let's take a recess.

(Whereupon, a brief recess was taken.)

JUDGE KLOVEKORN: Back on the record.

WILLIAM F. HECHT, recalled as a witness, having been previously duly sworn, was examined and testified further as

follows:

FURTHER RECROSS EXAMINATION

JUDGE KLOVEKORN: Mr. Mann.

BY MR. MANN:

Q. Mr. Hecht, in reference to a line of questioning we were doing before we had a discussion, I just wanted to, for the record, clarify what we talked about.

In response to interrogatory 200.582039, PP&L's number, you provided us with six studies which looked at the economic benefits or impact of the Susquehanna plants.

My question is other than the last one, which refers to an analysis of the costs and benefits of the Susquehanna first ten years of operation, is it true that the other studies, the first five, do not compare the costs of the operation of Susquehanna with the costs that would incur if Susquehanna did not operate?

A. That's correct. From those other studies you can derive the cost to consumers without Susquehanna by identifying the capital related Susquehanna costs and subtracting them out so you can derive part of what you are looking for.

The other part, the energy related costs of Susquehanna, cannot be directly derived from those studies. They were not prepared with that intent.

Q. Are you aware of any studies that were done prior

to the studies mentioned that were dated February 26, '81 and December 14, '81 that would give an analysis of the impact of Susquehanna versus no Susquehanna?

A. We'll check and if we have any, we'll provide them.

MR. MANN: Thank you. That's all, Your Honor.

JUDGE KLOVEKORN: Thank you, Mr. Hecht.

MR. YOUNG: I call Mr. Kenyon. Mr. Kenyon needs to be sworn, Your Honor.

BRUCE D. KENYON, called as a witness, having been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

JUDGE KLOVEKORN: Be seated.

MR. YOUNG: Your Honor, Mr. Kenyon's statement is Number 9 and it has already been placed in evidence and he's available for cross examination.

JUDGE KLOVEKORN: Mr. Wilmarth.

MR. WILMARTH: Because of some confusion concerning the scheduling of Mr. Kenyon's cross examination -- I think he was going to be placed on the stand tomorrow -- I would like to defer until after cross examination by OCA.

Hopefully I could get my ducks in a row while that's going on.

MR. POPOWSKY: I have just a few questions for Mr. Kenyon. My name is Irwin Popowsky, I am with the Pennsylvania Office of Consumer Advocate.

CROSS EXAMINATION

BY MR. POPOWSKY:

Q. I am concerned, first of all, with the projections of nuclear O & M. Could you describe briefly what process you utilized in developing the long term O & M projections for Susquehanna as utilized in Mr. Hecht's analysis?

A. First we developed the projected O & M costs for 1983. The 1983 costs actually were a culmination of a series of projections done over several years, each projection being developed in increasing detail and involving discussions with other utilities where their experience might be relevant and all of these estimates being reviewed by appropriate PP&L managers.

I might emphasize that the nuclear management of PP&L involves personnel having at least 15 years nuclear experience and in many cases, exceeding 20 and thus, even though we have not, as a company, operated a nuclear unit before, we have gone to great efforts to bring into the company people who do have a strong background in nuclear related matters and thus, are in a position to review these budgets.

Once having established the 1983 budget, we then proceeded to extend that out in time. That was done by factoring refueling outages which take place in different years and also reflect at some point in time, a change from

an annual fuel cycle to an 18 month fuel cycle.

We also factored in other items such as anticipated changes in manpower. We do maintain internally a five-year manpower forecast and to the extent those numbers produce changes, we applied those. We also made other adjustments where we could foresee that costs would change.

Having then established a base number for each year, in 1984, we applied an allowance, a contingency of 5 percent to that, recognizing that there will be some growth in expenses but beyond that, each year has a 10 percent applied to the total amount for the previous year and this is applied prior to escalation.

Escalation numbers, percentages were then used based on numbers provided by Mr. Beamer which has already been a subject of testimony and that is how we arrived at the long term estimate.

Q. Am I correct that the escalation rate that you referred to is the inflation rate?

A. Yes. Well, it's the numbers that he has testified to. To the extent that that's inflation or other factors, is --

Q. If we could just assume for the purposes of this line of questioning that Mr. Beamer has provided an escalation rate which is the inflation rate, am I correct that you did not apply any additional real escalation rate,

that is above the rate of inflation?

A. No. I already indicated we applied a 10 percent.

Q. A 10 percent contingency factor in each year, is that correct?

A. A 10 percent over the amount of the previous year.

Q. And then you applied an inflation rate --

A. On top of that.

Q. -- on top of that. How about after the year 1988?

A. The methodology that I described was used for the duration of the estimate.

Q. Could you turn to your testimony at page 25, lines 24 through 26.

A. I have it.

Q. Am I correct it states there that a levelized annual operating cost was used for 1988 and beyond with adjustments for inflation?

A. That is what it says.

Q. So what does that mean?

A. What it means is that it becomes very difficult to predict exactly when a refueling outage is going to take place and thus, rather than worry about each particular year and exactly which year that outage would fall, we levelized the effects of the costs of the roughly 18 month outage.

Q. In determining the levelized costs, did you first apply the 10 percent factor and then apply an inflation

factor for each year after 1988?

A. Once the costs were levelized, we applied the 10 percent and then we applied the inflation factor.

Q. There was an interrogatory response on this, but I would ask you whether now, you know what the real escalation rate in nuclear O & M costs have been for large boiling water reactors over the past ten years?

A. I do not know what the real escalation rate has been.

Q. Do you know whether, without discussing what the specific rate has been, do you know whether there has been a real escalation rate over and above inflation? Is that your impression?

A. Real costs have increased.

Q. But you don't know by what rate?

A. No. But obviously, in picking our rate, we had some feel for the industry rate and thus we believe our 10 percent is reasonable.

Q. But if I could just refer you to one of your interrogatory responses just to clarify that point which is Number 200.282233, which was an OCA interrogatory Number 49, capacity and energy savings.

MR. YOUNG: What were the first three numbers.

MR. POPOWSKY: 282223. I could just show it to you.

BY MR. POPOWSKY:

Q. Am I correct that you state in that response -- well, the question was, "In developing O & M costs in Attachment Number 3, was any analysis which passed new level plant O & M trends utilized?" And the response was, "Analyses of past new level O & M trends were not used in developing the costs on attachment Number 3." Do you recall that response?

A. Yes, I do.

Q. And that was a correct response?

A. That's correct.

Q. You stated in a subsequent response to a Susquehanna Alliance interrogatory which is numbered 200.582034 that, "PP&L is currently gathering and analyzing operating data of other nuclear facilities nationwide." Do you recall that response?

A. Yes, I do.

Q. Do you have any preliminary results of that analysis with regard to this specific question?

A. The specific question being --

Q. The historic escalation rates in nuclear O & M.

A. Okay. And are you asking escalation of real costs or inflation?

Q. You can give it both ways. The real or the total and then just tell us -- I think the most useful number would be the real escalation rates that you found to be the

case?

A. Okay. We have looked at industry costs in our review of these costs, we did not pull out what component of those costs were the results of real changes in costs of operation.

Q. Could you give us the total changes in the period that you are talking about? The total escalation?

A. I believe I have that information. I am just trying to find it.

A. The time frame that we looked at was 1978 through 1970 -- or 1981. During that period of time, O & M costs for the industry went up considerably, largely as a result of the effects of the Three Mile Island accident.

Q. You say they went up considerably. Can you tell us the numbers that you are looking at?

A. For example, total industry all nuclear facilities, and this is drawn from Federal Energy Regulatory Commission Form 1's, which are submitted by utilities to FERC, it indicated a 41 percent escalation in that limited period of time.

Q. That's between, just to be clear, starting in 1978 through 1981?

A. Yes.

Q. Forty-one percent escalation rate per year or total?

A. Per year.

Q. And as you said, that would include inflation?

A. That includes inflation.

Q. Have you done an analysis from the period from 1970 to 1978?

A. No, we have not.

Q. So the extent of your analysis has been 1978 to 1981?

A. The extent of our analysis using the FERC Form 1's as a means to make detailed comparisons, that's true. As I said earlier, most of our managers have come from other utilities, have experience with other units and are thus in a position, independent of having gone through statistical comparisons with other utilities, to come to a conclusion as to what reasonable costs are.

Q. Just to finish that line, I asked you if you did it from '71 to '78. You did not do it beyond 1981 either, that is that particular analysis? You stopped the analysis at 1981? Or have you included 1982, yet, in your analysis?

A. We were using this analysis to look at the reasonableness of our 1983 O & M costs. And thus we took projections of O & M costs from other utilities as a basis for concluding that our 1983 costs were reasonable. That was the purpose of the study.

Q. My only question is whether you continued that study into 1982, that particular study, or whether you

stopped it at 1981?

A. We took the latest information available. So we went as far as we could and that was '81.

Q. That was 1981. That was my only question.

A. Yes.

Q. Could you just specify what, for the record, when you said you went to the FERC Form 1's, could you specify which particular accounts you looked at?

A. We looked at the accounts that are relevant to operating and maintenance expense.

Q. Do you just offhand have a list of those? Which accounts?

A. No, I don't.

MR. POPOWSKY: I would just ask that they be provided just so we know we are looking at the same exact accounts.

THE WITNESS: Yes.

BY MR. POPOWSKY:

Q. Did you provide Mr. Vanderslice with a projected cost of the first refueling outage that was utilized in Mr. Vanderslice's testimony?

A. We did make projections of the first refueling outage costs. That's correct.

Q. And is it your expectation that the first refueling outage will last approximately 15 weeks?

A. That is correct.

Q. And will begin in September, 1984?

A. That reflects our present projection.

Q. I believe I asked a question to Mr. -- I think it was Mr. Vanderslice and it's a straightforward question, but it was deferred to you, but if Susquehanna for some reason operates at a capacity factor of lower than 65 percent, is it possible that the first refueling outage might be delayed beyond September, 1984?

A. It would be possible. The decision on when we conduct the outage is dependent on a variety of factors, certainly one of the most important is the economic costs to our customers as to when we do it. Sometimes as pre-empted by a failure of a plant component or an NRC mandated inspection. But if these factors do not intervene, then our decision on when the outage would be, would be based on economic considerations.

Q. What about capacity factor? Is there some window of time in which you can perform a refueling outage? I am talking about a refueling outage. Is there some particular point in time between -- two points in time between which it is necessary to conduct a refueling outage?

A. No. The earlier you perform it, in relation to how much fuel you have consumed, there is obviously an economic penalty for not using all the fuel. You can go beyond a point where operation at 100 percent power is possible. You

are basically starting to eat into the reactivity margins, but you have that latitude.

Q. Other than refueling, could you identify the major tasks that you expect will be performed during the first refueling outage?

A. The first refueling outage is typically one of the longer ones because it represents the first time you have had an opportunity to inspect components after their initial year of operation. Thus we would do a more extensive inspection than normal on the turbine and generator.

Typically, in a first refueling outage, you are making changes to the plant in response to problems that were discovered during the first year of operation. Also typically, there are NRC requirements which were not added to the plant as part of the initial licensing that we do have to address during the first outage.

So the combination of extensive inspections, maintenance, responding to open NRC requirements would be the major categories of items for that first outage.

Q. Am I correct that within the 15 weeks that you have currently planned, you have included some latitude to -- you have included those NRC requirements which you know about?

A. That 15 weeks is a projection based on the work that we are presently aware of. So -- and that would

include the outstanding NRC requirements. So they are within that 15 weeks.

Q. Is it conceivable that additional NRC requirements could be added between the date of commercial operation and the first refueling outage as to whether the first refueling outage would be the proper time to meet those requirements?

A. It's conceivable, but I don't think it's very likely.

MR. POPOWSKY: That's all the questions I have.

JUDGE KLOVEKORN: Thank you, Mr. Popowsky. Mr. Wilmarth?

MR. WILMARTH: Yes. Good afternoon, Mr. Kenyon.

MR. WILMARTH: My name is Frank Wilmarth. I represent the Commission Trial Staff here this afternoon.

BY MR. WILMARTH:

Q. I just have a couple questions concerning basically the attachment 2 that was appended to your statement of direct testimony, Statement Number 9, and as I understand it, that attachment purports to itemize the nuclear related operating expenses of the company projected on an annualized basis. Am I correct?

A. Yes, you are.

Q. In response to certain questions that we had concerning that schedule, we submitted to the company an interrogatory E-27 and response was prepared by the company

and identified for the purposes of this proceeding as PP&L Exhibit 200.182102 and I am providing copies of this to you, to counsel and have three for the reporter and one to Your Honor.

Mr. Kenyon, you were the individual responsible for that response, are you not?

A. Yes, I am.

Q. Specifically, our interrogatory concerned three particular items that were noted on an annualized basis on attachment 2, to wit: Budget item 24 and 25, Materials and Supplies; budget item 32, Work by Outsiders; and budget item 33, Services.

With regard to item 25, you have provided us with a response at subpart a, which is essentially the second sheet of the exhibit I just submitted to you.

A. Yes, I do.

Q. Very quickly, can you tell me what this "Rad Waste Resins" expense of $404.4 thousand for a seven and a half month period represents?

A. Resins are what you put into a tank that will filter water and remove impurities. As the water is discharged from the plant, we must process it through our radioactive waste system so that what we release to the environment is within limits and what we can reasonably achieve.

The resins are what we use to pull radioactive particles out of the water.

Q. This is water that you're putting back into the river?

A. That's correct.

Q. Next item there, drums and liners?

A. Okay. We also solidify radioactive waste and we compact trash that might be slightly contaminated. The compacted trash and the solidified waste is placed in either drums or liners, which are a larger container, and these containers are used for shipment of the radioactive waste, and burial.

Q. Down there three or four items lower, "Other Chemicals/Supplies", 197, almost 198,000. What is represented by that estimate?

A. The proper operation of a nuclear plant requires that you maintain various water systems within the plant within fairly tight specifications. We have a sophisticated chemistry lab at the plant. We have a staff of chemists that analyze the various systems within the plant.

In fact, they take about 25,000 samples a year. What's referred to here are re-agents, vials, bottles, vials, various chemicals that are used to support the chemistry lab.

Q. The items you have just described are consumable. Below that there is a section called spare parts.

A. Right.

Q. We have got a number of entries there. I assume there is an inventory level for all of these various parts that's maintained onsight, is there not?

A. Yes.

Q. Do the expense figures I see here represent that inventory level?

A. No. It recommends our projected turnover of that inventory. In other words, we have already initially developed an initial stocking of spare parts. We have made assumptions as to how often we are going to use various categories of spare parts and the money that's reflected in the budget is money to replace those spare parts as they are utilized.

Q. The inventory, itself is reflected in rate base somewhere?

A. Yes.

Q. Would you turn to the next page, please, Mr. Kenyon, "Work by Outsiders" and explain the first two items concerning disposal of low level rad waste?

A. The radioactive waste generated at Susquehanna is shipped to facilities that are authorized to bury the waste. There is a cost of transportation which is what we pay the company that actually transports the waste and that's represented by the first line. The second line is the cost

we pay to the company that buries the waste.

Q. What kinds of wastes are we talking about?

A. Radioactive wastes.

Q. Examples?

A. The resins, as I mentioned are exhausted after a period of time. They are solidified, put in a liner and sent to be buried.

Q. Is that it? Can you give me another example?

A. Another example are contaminated materials that, perhaps we cut a valve out that is not repairable any longer. We might package that up and send that out if we cannot remove the contamination and return it to service.

Q. All right. Down near the bottom of the page, GPA Maintenance Contracts, what does GPA stand for?

A. General President's Agreement. This is a national agreement with the building trades. It provides a contract, a labor relations contract, if you will, that allows the utilization of the signatory craft trades to work at Susquehanna in other than a construction mode, and by using the crafts under this agreement, we achieve certain advantages with regard to overtime rates, with regard to jurisdictional disputes. In other words, it allows us to use the construction trades in a less costly manner.

Q. You're using them to perform maintenance work?

A. No. What that represents is, in staffing our

nuclear activities, it would be nice if the level of work was constant and thus we could staff for that level of work. The reality is that there are peaks and valleys in the level of work. Thus we staff for the valley but we still have to man for the peak.

The peak is typically the refueling and maintenance outage where we need a large number of maintenance workers. The General President's Agreement represents our major source of supplemental workers outside PP&L. We bring them in as necessary to man for the peaks.

Q. Lastly, would you turn to the final page which is essentially the response to subpart C of the staff interrogatory. The very first entry, Ecological Monitoring, could you explain what that is?

A. Yes. We have, as indicated, three environmental monitoring programs. The ecological monitoring program is a program that is not looking at the effects of radioactivity in the environment. It is looking at other effects.

These include the effect of the cooling tower plume, the effect of discharging water into the Susquehanna River here. The consideration would be a thermal effect. Also, the effect of withdrawing water from the river into the plant where one of the first things you would look at is the potential effects of entrainment.

Thus, the studies mostly deal with organisms and fish

within the river within one mile, vegetation near the cooling tower where we are looking for salt buildup. These are base line studies we have done up to now.

What we will be looking at is whether or not the operation of the plant is having any significant effects on the environment in this area.

Q. What do you mean by base line studies?

A. You establish what the environmental conditions are in the area surrounding the plant, thus you are in a position to know whether or not any changes are taking place.

Q. Now, the next entry leaves me a little bit baffled. Radioactivity, SSES environment?

A. This would be the radiological portion.

Q. You're talking about radiological monitoring?

A. Yes. Here again, we want now to determine the effect of any radiation released in the environment and whether or not that is having an effect. So this set of studies deals with that aspect.

Q. Would you call that a base line study as well?

A. Initially, it was a base line study. Ongoing, we are looking to see if based on the data we collected from the base line study are any changes taking place.

Q. Were you able to break out, from item 1 and/or item 2 the portion of that figure representing the base line study activity --

A. The base line study is in the capitalized costs of the plant.

Q. Well, now, that isn't what you just told me.

MR. YOUNG: Yes, it is. It's exactly what he said from the beginning.

BY MR. WILMARTH:

Q. Mr. Kenyon, you indicated the figure represented base line studies, primarily?

A. Let me restate it.

Q. If that's not correct, you do restate it, please.

A. What I am saying is that we have previously performed base line studies. Those base line studies are in the capital costs of the plant. The ongoing study, which is what it is in O & M costs, is a study to see whether or not looking at the parameters that I mentioned, there are any environmental changes taking place as a result of the operation of the plant.

Q. It really isn't what you call -- it isn't necessarily an ongoing study. It's ongoing monitoring. Continual examination of the environment for ecological effect or for radiological effect, is that right?

A. I think we are saying the same thing, yes.

Q. In other words, I can assume these studies are going to continue on into perpetuity?

A. Yes, they are.

Q. Maintenance, engineering support, $305,000.00, seven and a half month basis, correct?

A. Yes.

Q. What does that represent, Mr. Kenyon?

A. Let me categorize a set of costs of which engineering support is a portion. During the first year of operation, we are going to find problems with the plant that need resolution. During the first year of operation, you find more problems than you find in subsequent years.

We have staffed for the long range. Thus, during the first year of operation, we have a need for resources that's over and above the long range need. The engineering support represents a small number of engineering personnel that we believe we will have to call on in order to provide the supplemental resources to deal with the various technical problems that may occur during the first operating cycle.

Q. All right. Moving down about four or five lines, planning. Plant staff, scheduling needs and outage planning. Can you indicate what kind of activities are envisioned under those expense claims?

A. In looking at the causes of lost capacity for nuclear plants in the industry, one of the major controllable causes is the length and extent of the refueling outage. I believe that one of the most important things that you can do to minimize that outage is do a very,

very thorough job of planning.

Since we will be coming up on our first refueling outage, since it's very important to get that outage off on the right foot, we are utilizing the services of a couple of additional people who have been involved in planning other refueling outages, really to refine our techniques, our methodology.

We do not anticipate needing outage planning beyond the first outage. But it's for the purpose of helping us do a good job after the first outage.

Q. That is what? You don't anticipate needing what was the first thing?

A. Consultant's report.

Q. Which item are you referring to?

A. The outage planning.

Q. How about the item right ahead of that? The plant staff scheduling needs?

A. That falls into the same category as my response to the engineering support. In other words, we expect to have a larger than normal number of problems during the first cycle. The problems need to be corrected, correcting them on a timely basis involves planning, so we have supplemental planning resources for that activity.

Q. And that's what that represents? Those supplemental resources?

A. Yes.

Q. For the first refueling outage?

A. For the first operating cycle.

MR. WILMARTH: I don't have anything else, Mr. Kenyon. Thank you very much.

JUDGE KLOVEKORN: Mr. Mann?

MR. MANN: I have no further questions.

JUDGE KLOVEKORN: Ms. Rosner?

MS. ROSNER: No, Your Honor.

MR. YOUNG: Nothing.

JUDGE KLOVEKORN: If there is nothing further, the witness is excused.

MR. YOUNG: Mr. Koppe.

ROBERT H. KOPPE, called as a witness, having been duly sworn, was examined and testified as follows:

JUDGE KLOVEKORN: You may be seated.

DIRECT EXAMINATION

BY MR. YOUNG:

Q. Your Honor, Mr. Koppe's Statement Number 15 and his exhibit, RHK-1 have been introduced in evidence and he's available for cross examination.

MR. WILMARTH: I have no questions, Your Honor. Thank you.

JUDGE KLOVEKORN: Mr. Popowsky?

MR. POPOWSKY: Thank you, Your Honor. Good afternoon,

Mr. Koppe, my name is Irwin Popowsky, I am with the Consumer Advocate's Office.

THE WITNESS: Good afternoon.

CROSS EXAMINATION

BY MR. POPOWSKY:

Q. Is it your testimony that the Susquehanna units would utilize an 18 month refueling cycle?

A. I understand from the company that they are planning to utilize an 18 month refueling cycle. I am not testifying to that specifically.

Q. That was part of the assumptions that you utilized in your analysis?

A. Actually, the capacity factors I derived for Susquehanna were based on the assumption of a 12 month refueling cycle, but after the company decided to go to the 18 month cycle, I felt that that was a further conservatism in the estimates and we should stay with the estimates I had originally made.

Q. Was it your testimony or is it your understanding that Susquehanna will always run at full capacity whenever the unit is available?

A. My understanding is that that's the intention, yes.

Q. And that it will never fail to be utilized either for economic or load following reasons?

A. That's my understanding.

Q. And is that true indefinitely or at least through the year 2,000, to your understanding?

A. My understanding is that that's always true, yes.

Q. We were supplied with answers, I believe it was yesterday, to some interrogatories by the Susquehanna Alliance and there were just a couple figures in those interrogatories I would like to confirm with you on the record.

Am I correct that in response to Susquehanna Alliance Interrogatory Number 14, attachment 1 to PP&L response 200.582014, the average capacity factor for boiling water reactors, that is BWR-3 and 4 reactors in 1980 was 59.2 percent?

A. That's correct.

Q. And in 1981, the average was 58.35 percent?

A. That also is correct.

Q. And in the first nine months of 1982, the average was 61.0 percent?

A. Yes.

Q. Could you turn to the response number 18, which is Interrogatory Number 18, which is PP&L response Number 200.582018. Do you have that?

A. Yes.

Q. And I believe this would be on attachment 2. Am I correct that the unadjusted historical capacity factors for

the first four years of operation for BWR 3's and 4's through the first nine months of 1982 has been 54.4 percent? Is that correct?

A. Yes.

Q. And for mature years, 5 through 12, the unadjusted -- and by unadjusted, I take it you mean -- let me rephrase the question, that the historical capacity factors for the mature years 5 through 12 were 64.3 percent?

A. That's right.

Q. In response to an earlier OCA interrogatory, which has been numbered by PP&L as 200.282211, at the third page of your response, you state several reasons why you believe that future NRC requirements will have a smaller impact on SSES than past requirements have had on earlier plants. Is that correct?

A. That's correct.

Q. The third reason that you give is that, "There is a large and growing body of evidence that the risk from nuclear accidents is much smaller than previously thought." Is that correct?

A. Yes.

Q. What evidence are you specifically referring to there?

A. Extensive analyses and tests that indicate that containments are much less likely to fail after core melt

than previously thought and extensive analyses and tests that indicate that the release of radioactivity from accidents is much less than previously thought. That is the release from the core, whether or not the containment is there.

Q. Are you referring to the probability analyses recently performed for the NRC?

A. This is not specifically probabilities. These are physical processes that we are talking about in this case. A number of years ago, for instance, it was anticipated that at least in some cases when cores melted, what's called a steam explosion would damage the containment. There have been a number of tests now that indicate that that just doesn't happen.

There have been many tests with molten fuel where much smaller fractions of radioactivity become airborne and that airborne tends to agglomerate into aerosols, glade out, deposit locally much more quickly than was previously thought, so the amount of radioactivity which is dispersed is lower. These are all physical processes, they are not probabilistic calculations.

Q. Are you familiar with the probabilistic studies that have been performed starting with the Rasmussen Report for the NRC?

A. Yes.

Q. What are the trends with regard to those studies. What is the history of the Rasmussen Report, for example?

A. Most of the studies we have been -- well, starting with the Rasmussen Report and the subsequent ones, the estimates of the probability of core damage or accidents which cause core damage have remained roughly the same or perhaps increased a bit.

Most of the risk assessments which have been done have used the models of the physical processes following an accident that were used in the Rasmussen Study and so there hasn't been any change there.

A few of the more recent analyses such as those for Zion and Indian Point have made use of some, but far from all of the more recent experimental evidence on the consequences of accidents and have, indeed, projected lower risks.

Q. What about the costs of an accident? Are you familiar with any more recent statements on the costs of a nuclear accident? Probability studies?

A. What kinds of costs?

Q. Economic costs, worst case scenarios? Have additional analyses been done by the NRC or for the NRC with regard to the possibility of certain accidents occurring and the likelihood of harm from those accidents? Are you familiar with any such analyses?

A. There have been a number of such studies.

Q. Are you familiar with them? Could you briefly describe the results of those analyses?

MR. YOUNG: Your Honor, I object to that question. I really don't see what now this has to do with the question of the capacity at which this station is likely to operate. It may have some relevance to what the probability is of accidents or what the physical analyses show is likely to happen as that impacts on it, but I don't see that the costs that are thereafter incurred have anything to do with the capacity factor.

MR. POPOWSKY: Let me ask the witness.

BY MR. POPOWSKY:

Q. Why did you include them in your analysis of why future NRC requirements will have a smaller impact on SSES than past requirements? Why did you include in that as a third reason that there is a large and growing body of evidence that nuclear accidents are much less costly than originally thought?

MR. YOUNG: Costs have nothing to do with risk. I think he's been talking about risk until you got to the last question. Costs have nothing to do with that.

MR. POPOWSKY: I'll withdraw the prior question and go back to your interrogatory response.

BY MR. POPOWSKY:

Q. You state there is a large and growing body of evidence that the risk from nuclear accidents is much smaller than previously thought. Why did you include that statement as a reason for a possible higher capacity factor for SSES?

A. A substantial portion of the outages that have been experienced in the past in nuclear plants have been the result of NRC requirements to modify the plants in ways which are intended to reduce the risk from accidents.

The fact that it is now clear, and most people in the NRC now recognize that the actual risks are already lower than previously thought, is one more reason to believe that they are less likely to impose requirements in the future. Certainly, they are not going to impose them at the kind of rate that we have experienced over the last ten years.

Q. So it's your opinion that the NRC will be doing less ordering plants to shut down for certain safety requirements that has been done in the past?

A. I think they are going to order that less in the future, that is correct.

Q. Are you familiar with capacity factors that have been -- are being projected, other consulting organizations, such as for comparable plants such as Sargent and Lundy or National Economic Research Associates?

A. I have seen some studies by NERA. I haven't seen

anything from Sargent and Lundy.

Q. From what you've seen from NERA, do you know whether their projections for capacity factors are comparable to yours?

A. I believe they are lower.

Q. Are they closer to 60 percent?

A. No. I might say that Lew Pearle at NERA is an excellent economist, but doesn't know a thing about power plants.

Q. One other question. At page 28 of your testimony, you state that there is nothing in the data to date which would indicate any tendency of unit performance to decline with age?

A. I am sorry, are we in RHK-1? We can't be in the testimony.

Q. I am sorry. We are not in the testimony. RHK-1, page 28.

A. Yes.

Q. You indicate that there's nothing in the data to date which would indicate any tendency for unit performance to decline with age. How much data is there with regard to large boiling water reactors in their 11th through 20th years of operation?

A. That's in one of the tables somewhere. Of the large plants, the earliest ones started up in the early '70's.

So for the most part, there are a few in their 11th and 12th years and quite a few in their 8th, 9th and 10th year.

Q. There is little historic data with regard to plant operations after the 10th year?

A. That's true.

Q. No data with regard to the 20th year, the large boiling water reactors?

A. That's true.

Q. Just one other question. You make some -- I asked you if you were familiar with the NERA capacity factors. You said you were, but you were not knowledgeable about the Sargent and Lundy, if there are such capacity factors projected by Sargent and Lundy. Could you just describe is Sargent and Lundy a consulting organization that is used by the nuclear industry?

A. Sargent and Lundy is an architect-engineering company. Some people call them consultants. Some people distinguish.

Q. And they are involved in the nuclear industry?

A. Yes.

MR. POPOWSKY: That's all the questions I have.

JUDGE KLOVEKORN: Thank you, Mr. Popowsky. Mr. Mann.

MR. MANN: Thank you, Your Honor.

BY MR. MANN:

Q. I have one follow up question to one of Mr.

Popowsky's questions. When you talk about the risk from an accident. Could you specify what risks you are talking about?

A. I am talking about public health risks.

Q. Are you familiar with the Sandia Lab studies which were recently made public?

A. Yes.

Q. Would you characterize those as quantifying the risk from an accident as being less than previously quantified?

A. No. The Sandia Study was not an attempt to quantify risks. They made assumptions in that study which are totally inconsistent with any number of physical phenomena, including those involving the dispersion of radioactivity.

They basically assumed that releases from accidents would be comparable to those which were assumed in Wash 1400. Since Wash 1400 was done, there have been all these studies and tests which I was alluding to earlier which indicate that in actual fact, the release of radioactivities from accidents are much lower than that.

So they were looking at effects of different meteorologies and things like that on dispersion of radioactivity but they were not making realistic assumptions about containment failures, they were not making

realistic assumptions about release of radioactivity, they were not making realistic assumptions about dispersion of radioactivity.

They simply were not and were not intended to be a realistic analysis of what would happen after an accident.

Q. Whether or not you agree with the assumptions, the Sandia Lab Study does, though, project a public health risk from an accident, is that not true?

A. Yes.

Q. And the public health risk that they project is greater than previous projections, is that true?

A. I don't think so. I think they projected that the absolute worst case with the worst combinations of meteorology and population distributions were higher than the previous worst case, but I simply don't know, when you average over a number of accidents or over a number of possible scenarios which is the only way to determine average risk, I really don't know whether they came out higher or lower. I didn't look at that.

Q. Thank you. Mr. Popowsky referred to response to interrogatory 200.582014, and I would like to move that one along with 200.582015, have them marked the PP&L Exhibit numbers just mentioned.

JUDGE KLOVEKORN: Without objection.

(PP&L Exhibit No. 200.582014, Response to Interrogatories of Susquehanna Alliance, Set II, dated February 6, 1983, was produced and marked for identification.)

(PP&L Exhibit No. 200.582015, Response to Interrogatories of Susquehanna Alliance, Set II, dated February 6, 1983, was produced and marked for identification.)

BY MR. MANN:

Q. Mr. Koppe, you responded, in response to our interrogatory, which is labeled 37 and number 200.358217, you have not included data from the period 1981 and 1982 because it was not yet entered in the computer to verify it. When was Exhibit RHK-1 prepared?

A. I don't remember. Early last year, middle of last year. I really just don't remember. You'd have to do something to refresh my memory.

Q. We can get the exact date later. But it was sometime in the middle of 1982, roughly?

A. I believe so.

Q. Okay. In response to another interrogatory, PP&L Number 200.582025, you indicated that you had not modeled a learning curve for the experience of boiling water reactor capacity factors, because you didn't think it was possible to do this, could you explain why you thought it wasn't possible?

A. Traditionally, a learning curve means that you look

at the performance of some piece of equipment or some product as a function of the time in which it was manufactured or produced.

The assumption is that you are looking at a time period which is fairly long with respect to the time it takes to design and produce the product. So that, for instance, if you are making some kind of a tool, it perhaps takes you a year or two to design it or manufacture it. Another year or two to get a fair amount of operating experience with it.

You learn from that, and in your next product, you improve the design. And over a period of time, you should see the performance of that product improving. With nuclear plants, where most all of the experience with these plants has accumulated in the last 12 years, and where it takes, now, 12 years to design and build a plant, you're simply just getting plants now which represent, in effect, the second generation.

Superimposed on that, you have the fact that plants, designs went through a number of evolutions. The change, from BWR 1's, to 2's, to 3's, to 4's, which took place before there was operating experience. You have some superimposed on the operating experience, the designs that were changing without the operating experience.

On top of that, you have the fact that since it takes

so long to design and build a plant, some of the things you learn from previous problems, get incorporated into the earlier designs part way through the building of the plant, even though they weren't incorporated in it when it started.

On top of that you have the fact that it isn't like a tool which you send out or a refrigerator which you build and send, that it works or doesn't work.

The plants, themselves, incorporate design changes to improve past performance. So you have so many of these different things at work in a time frame which is short compared to the design and building cycle for the plants, that you might see substantial increases in performance. You might see substantial decreases in performance and neither of those would necessarily be indicative of any overall learning process.

Q. Did you take a look at the progression of learning experience based on the in-service date to see if there was any trend?

A. If you simply look at the average performance of the units which are in operation now as a function of their in-service date, there is not a significant difference, because all of these different things I was talking about were going on at the same time.

It is only now with plants like Susquehanna and some of the other ones that are coming along that you finally

have plants starting up which do not represent major design extrapolations that are made without operating experience and also do include most of the major design changes that have been required in response to past operating problems.

So it's only now that you should expect to start seeing improvements in performance of the newer units. That is to say the newer units doing better than the earlier units have indicated.

Q. Would it be fair to characterize your analysis as concluding that a purely traditional statistical analysis of historical capacity factor would not be adequate at predicting the operation of the Susquehanna units and there needs to be incorporated in that some judgment as to how well plants will operate in the future based on events that happened in the past?

A. Yes. Purely statistical analyses only make sense if the things you are doing the stastical analysis on are the same as the thing you are projecting the performance of. You don't do a statistical analysis on 1910 airplanes to project the performance of jet airplanes. It doesn't work.

If you don't have experience with jet airplanes you have to use some judgment or experimental data. You cannot apply statistics from one kind of a machine to the performance of another kind of machine.

Q. So a significant factor in your projections of the

capacity factors is your judgment based on the analyses you have done and the reasons for outages and so forth?

A. Certainly is.

Q. Would you turn to page 22 of your exhibit. At the top of that page the first two sentences. The relatively poor performance in 1980 was primarily due to the large number of NRC required outages. It is expected that BWR 3 and BWR 4 unit performance in subsequent years will return to and exceed the 1979 level.

At that point that you prepared this exhibit, was that your judgment as to what we do expect in the near term future for capacity factors?

A. Yes.

Q. Previously Mr. Popowsky read into the record the values for capacity factors in the years 19 -- I believe it was 1979 through 1982. Let me just read them to make sure we have all these. 1979 --

A. Hang on a second. Let me get my --

MR. YOUNG: What are you reading from?

MR. MANN: 200.582014, attachment 1, the bottom line, which is the boiling water three and four age average. For 1979 you show 67.0 percent; 59.2 percent for 1980; 58.5 percent for 1981, and 61 percent for 1982. Just before I clarify that, I wanted to ask about a discrepancy in your direct testimony on page 21. I am sorry. I must have the

wrong reference here. I am sorry. It was page 21 of your exhibit.

A. Yes.

Q. You show a capacity factor for 1980 of 60.2 percent and this response to interrogatories showing 59.2 percent. Do you know the reason for the discrepancy or which one was accurate?

A. I made a mistake someplace but I don't know which one is correct.

Q. If we could clarify that at some point.

A. Sure.

Q. Anyhow, getting back to my original question, if the capacity factor fell from 1979 levels of 67.0 percent to 59.2 percent, fell again in '81 to 58.5 percent, and rose in 1982, do you feel this could be characterized as returning to the 1979 levels?

A. When I wrote that testimony it was already in 1982. So obviously I was talking beyond 1982. 1981 history and a good fraction of 1982 had already happened and all of those capacity factors of roughly 60 percent in 1980, 1981, and 1982 are directly related to the NRC requirements for the suppression chamber modifications and pipe hanger modifications.

Those things are only now being finished at all of the operating BWR's as they have been at Susquehanna and I

expect over the next year or two we are going to see those existing operating plants return to levels at least in the mid to upper 60's.

I don't expect them to do as well as Susquehanna because they still have a number of problems built into them such as a lot of 304 stainless steel that's going to be susceptible to pipe cracks which Susquehanna does not have. I do expect them, over the next year or two now, to start picking up into more like the mid 60's to upper 60's which we were seeing in 1979.

Q. So it is your judgment that following 1982, they will return to the 1979 levels. Is that true?

A. Yes.

Q. In your analysis, did you include any contingency for site specific problems that might arise as opposed to generic problems? For example, I would characterize the fire at the Brown's Ferry reactor as a site specific problem. In other words, have you factored into your analysis a contingency for an accident happening that is not necessarily a generic problem but is a problem that's created by a specific situation at the Susquehanna stations?

A. I guess there are two parts to that. There are a certain number of site specific equipment problems which are more or less inevitable at a plant. In doing my analysis for Susquehanna, I assumed that Susquehanna would have those

problems at the same rate that previous plants have. That's a contingency allowance.

Obviously, we can't know what the specific problems in Susquehanna would be. If you knew about them, you would correct them. As far as problems such as the Brown's Ferry fire, which I would characterize as not a specific, but a unit specific problem which was extraordinary in character.

There is an allowance in the Susquehanna capacity factors for that sort of thing, although obviously, the probability of a Brown's Ferry fire at Susquehanna is essentially zero. I didn't make a separate allowance for site specific and for generic things.

There is an allowance in there for unanticipated problems and that includes both unit specific and generic.

Q. Did you, in calculating the capacity factor for the Susquehanna units, consider any specific generic issues which are now before the Nuclear Regulatory Commission with regard to boiling water reactors in terms of the impact they would have on the future operation. If so, could you tell us which ones?

A. No. I have reviewed all of the generic issues that are currently before the NRC at one point or another. I did not make specific allowance for specific potential requirements.

Q. You were talking about how the outages and so forth

were caused by particular regulations or new regulations or guidelines from the Nuclear Regulatory Commission. To your knowledge, were the hanger modifications required at Susquehanna unit specifically related to these new NRC guidelines?

A. Someone else should answer this.

MR. YOUNG: I think that's clear from Mr. Curtis' testimony which we labored through for at least two days. I can't imagine why he would ask the question again of this witness.

MR. MCCLELLAND: I think it would be relevant, Your Honor, because much of this depends on the new regulations.

MR. YOUNG: I am saying we have already devoted two full days about the regulations and the NRC requirements relative to the hangers they have.

MR. MCCLELLAND: I think what this question goes to is whether this has anything to do with new NRC guidelines.

MR. YOUNG: It is obvious it does because that's what Mr. Curtis testified to.

MR. MCCLELLAND: But this witness hasn't addressed it.

MR. YOUNG: They have been made as far as hangers are concerned in this statement.

MR. MCCLELLAND: That begs the question.

MR. YOUNG: I don't see what the question is. I object to the question.

JUDGE KLOVEKORN: Could you restate the question, Mr. Mann.

BY MR. MANN:

Q. We have talked about how the new Nuclear Regulatory Commission regulations have been issued and the new guidelines have affected the capacity factor for boiling water reactors in the past. Is it your opinion that the hanger modifications that were required at Susquehanna units were also significantly related to Nuclear Regulatory Commission guidelines?

A. Sounds like the same question to me.

MR. YOUNG: That's the same question I objected to.

MR. MANN: He asked me to restate the question.

MR. YOUNG: I think he meant to rephrase it.

JUDGE KLOVEKORN: I'll sustain Mr. Young's objection.

BY MR. MANN:

Q. Mr. Koppe, you stated that you performed the study that has been submitted as your exhibit sometime in 1982. Had you previously, prior to the completion of their study, done any work for Pennsylvania Power and Light Company in terms of predicting capacity factors for the Susquehanna units?

A. Yes.

Q. Could you tell us when that was?

A. A couple of years ago, I did a similar thing for

the construction permit hearing, NRC construction permit hearing for Susquehanna.

Q. And do you remember what your predictions were at that point as to what the capacity factor would be both in the early years and as you characterize them, the mature years?

A. It was the same.

Q. They were the same?

A. Yes.

MR. MANN: I have no further questions, Your Honor.

JUDGE KLOVEKORN: Ms. Rosner?

MS. ROSNER: None, Your Honor.

JUDGE KLOVEKORN: Any redirect?

REDIRECT EXAMINATION

BY MR. YOUNG:

Q. Mr. Koppe, you have been asked about certain updating of the statistics in the two exhibits that were produced by the Susquehanna Alliance. Do the actual capacity factor experiences of BWR 3 and 4's in 1981 or in 1982, which was the only addition to your testimony, cause any change in your prior opinion as to the capacity of Susquehanna?

A. No, they don't. In my testimony, I referred to the numbers through 1980 and then talked about the experience in 1981 and 1982 and indicated that it was lower than the

historical averages, that being about 60 percent rather than the 65 or 66 percent that had been experienced before that for mature performance and indicated that the reason for that low performance in '81 and '82 was the NRC required modifications, primarily the pressure, suppression chamber and the pipe hangers.

Given that those problems had already been solved on Susquehanna, that the 1982 performance was consistent with an expectation of 70 percent mature capacity factor for Susquehanna.

MR. YOUNG: I have no further questions

JUDGE KLOVEKORN: No other questions, the witness is excused. Thank you very much, sir. If there is nothing further this afternoon --

MR. WILMARTH: Your Honor, I would like to move into evidence the document marked for identification and referred to as 200.182102.

(PP&L Exhibit No. 200.182102, Response to Interrogatories of the PUC Trial Staff, Set IX, dated January 17, 1983, was produced and marked for identification and received in evidence.)

JUDGE KLOVEKORN: Without objection, it will be received into evidence.

If we have nothing further this hearing will stand adjourned.

(Whereupon, at 4:23 p.m., the hearing was adjourned.)

I hereby certify that the proceedings and evidence are contained fully and accurately in the notes taken by me during the hearing of the within cause, and that this is a true and correct transcript of the same.

EUGENE W. HOLBERT, CP
Registered Professional Reporter

The foregoing certification does not apply to any reproduction of the same by any means unless under the direct control and/or supervision of the certifying reporter.

HOLBERT ASSOCIATES
1001 N. Second St.
Harrisburg, Pa. 17102

Pennsylvania Power & Light Company
Response to Interrogatories
of the Office of Consumer Advocate
Set I - Capacity Requirements/Energy Savings
Dated January 3, 1983

Docket No. R-822169

Q.41. Were any estimates, similar to those reported in WFH-3, made which used more than one of the assumption changes shown in Figures 11, 13, and 15? For instance, was an analysis performed which assumed both reduced capacity factors and reduced fuel cost escalation? If so, please provide all such analyses.

A.41. PP&L developed an estimate of the net savings due to Susquehanna SES for the case combining the three parameter variations used in Figures 11, 13, and 15. The likelihood of these conditions occurring simultaneously is a function of the likelihood of occurrence of the individual events. For example, PP&L's studies indicate that the probability of loads being equal to or less than the values used in the low load growth case is five per cent. Thus it is quite unlikely that conditions represented by this single parameter will occur.

While a quantitative assessment of associated probabilities for the capacity factor and low rate of increase in fuel prices has not been made, it is expected that the occurrence of such events is substantially less likely than the base case assumption. Further, the probability of the simultaneous occurrence of the three variations described above would tend to be extremely small.

In spite of the extreme assumptions of this case, SSES begins to produce annual benefits before the end of the study period. Figure 1 lists the results of this analysis and they are plotted in Figure 2.

FIGURE 1

PP&L NET BENEFITS OF SUSQUEHANNA SES
WITH REDUCED SSES CAPACITY FACTOR (1),
A REDUCTION IN LOAD GROWTH RATES (2)
AND A REDUCTION IN RATE OF INCREASE OF
FOSSIL FUEL PRICES (3)
(MILLIONS OF DOLLARS)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL SUSQUEHANNA SES CAPITAL & O&M COSTS	231	421	790	795	802	795	800	807	827	892	910	937	956	971	986	998	1017	1037	1071	1110
TOTAL PP&L OPERATING SAVINGS	57	91	253	282	346	430	482	531	598	638	643	732	756	805	857	913	973	1036	1103	1175
NET PP&L SAVINGS	-174	-330	-537	-513	-456	-365	-318	-276	-229	-254	-267	-205	-200	-166	-129	- 85	- 44	- 1	32	65

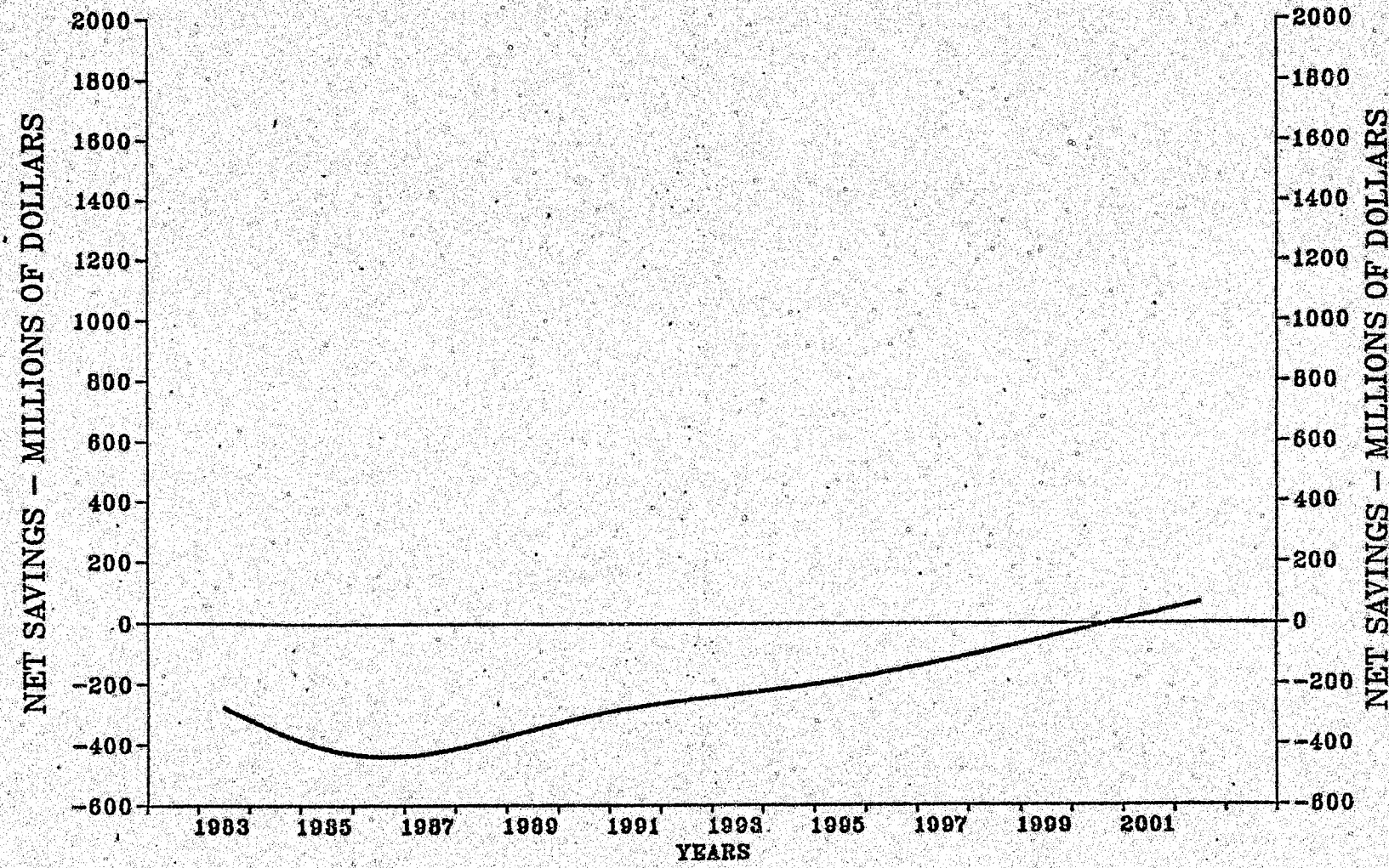
(1) SSES CAPACITY FACTOR REDUCED 10 PERCENTILE FROM BASE CASE EACH YEAR.

(2) PP&L ANNUAL PEAK LOAD GROWTH RATE REDUCED FROM 1.8% TO 0.8% WITH SIMILAR REDUCTIONS TO PJM PEAK LOAD.

(3) ANNUAL RATE OF INCREASE IN FOSSIL FUEL PRICES REDUCED BY 20%.

Attachment 1
200.282099

FIGURE 2
PP&L NET SAVINGS DUE TO SUSQUEHANNA SES
WITH REDUCED SSES CAPACITY FACTOR (1),
WITH A REDUCTION IN LOAD GROWTH RATES (2),
AND A REDUCTION IN THE RATE OF INCREASE IN FOSSIL FUEL PRICES (3)
— PROJECTED OVER TIME —



(1) SSES CAPACITY FACTOR REDUCED 10 PERCENTILE FROM BASE CASE EACH YEAR.
(2) PP&L ANNUAL PEAK LOAD GROWTH RATE REDUCED FROM 1.8% TO 0.8% WITH SIMILAR REDUCTIONS TO PJM PEAK LOAD.
(3) ANNUAL RATE OF INCREASE IN FOSSIL FUEL PRICES REDUCED BY 20%.

Attachment 2
200.282099

W. F. Hecht

Pennsylvania Power & Light Company
Response to Interrogatories
of the Office of Consumer Advocate
Set I - Capacity Requirements/Energy Savings
Dated January 3, 1983

Docket No. R-822169

Q.8. On page 30 beginning at line 4 you describe utilities as planning "their systems to minimize customer costs...recognizing basic reliability concerns." Would maintaining a reserve margin of 15% as described in WFH-1, page 3-10, constitute reasonable recognition of reliability concerns? If it would not, please provide the reserve margins sufficient to maintain reliability in each year 1982-2002.

A.8. The reserve level described in Exhibit WFH-1 page 3-3 represents a projection of PP&L's capacity obligation to PJM as taken from Tables 3-2 through 3-4 of that same Exhibit. It is important to understand PP&L's relationship with the other members of the PJM power pool in order to understand a "reasonable recognition of reliability concerns."

A goal of the members of the PJM interconnected system is pool reliability. An initial step in achieving this reliability level is to determine the installed capacity level required to maintain aggregate pool load requirements. It is only after this determination is made that the capacity requirements of each member are determined. The pool installed capacity requirement is then allocated among its members based on such items as the member's contribution to pool peak, generation availability, etc.

Currently, PP&L is a winter peaking company while PJM, as a whole, is summer peaking. Additionally, PP&L's generator availability is relatively high compared to those of other PJM members. Both these factors produce an allocation, when measured as a percent reserve over annual peak, to be substantially below the average for the pool (22%). PJM is currently tending toward winter peaking and this trend is expected to continue. As a result, PP&L's percent reserve will increase with respect to the pool average. The updated version of Table 3-2 corresponding to the load and capacity data in Exhibit Reg. I-B-6 valuation (Docket No. R-822169) is attached. The columns on this table entitled "Capacity Obligation" list the minimum capacity levels that constitute a reasonable recognition of reliability concerns.

It is important to note that these reserve margins, while meeting minimum reliability concerns, do not necessarily minimize customer costs over time.

WINTER LOAD/CAPACITY/RESERVE SUMMARY
1.8% PEAK LOAD GROWTH (1981-2002)[6]
EXPECTED CASE

Year	Peak Load (MW) Summer	Peak Load (MW) Winter	Installed Capacity (MW) Additions	Retire.	Total Planned	Purchases/Sales[3] AE	LU	ACE	Net Installed	Actual Reserves MW	Actual Reserves %	Capacity Obligation[4] Total Req. MW	Reserves MW	Reserves %	Reserve Over Obligation MW	Reserve Over Obligation %
1982	3930	4850	0	0	6546	0	-111	0	6435	1585	32.7	5389	539	11.1	1046	19.4
1983	4050	4920	945[1]	0	7491	65	-114	-62	7380	2460	50.0	5461	541	11.0	1919	35.1
1984	4120	4970	945[1]	0	8436	120	-117	-125	8314	3344	67.3	5651	681	13.7	2663	47.1
1985	4170	4990	50[2]	0	8486	100	-123	-125	8338	3348	67.1	5491	501	10.0	2847	51.8
1986	4220	5170	13[2]	0	8499	80	-97	-125	8357	3187	61.6	5689	519	10.0	2668	46.9
1987	4340	5310	0	0	8499	60	-68	-125	8366	3056	57.6	5840	530	10.0	2526	43.3
1988	4460	5470	0	0	8499	40	-36	-125	8378	2908	53.2	6074	604	11.0	2304	37.9
1989	4600	5590	0	0	8499	15	0	-125	8389	2799	50.1	6203	613	11.0	2186	35.2
1990	4700	5660	0	0	8499	0	0	-125	8374	2714	48.0	6341	681	12.0	2033	32.1
1991	4770	5800	0	0	8499	0	0	0	8499	2699	46.5	6499	699	12.0	2000	30.8
1993	4980	6010	0	0	8499	0	0	0	8499	2589	43.8	6619	709	12.0	1880	28.4
1994	5060	6160	0	0	8499	0	0	0	8499	2489	41.4	6731	721	12.0	1768	26.3
1995	5180	6270	188[5]	0	8687	0	0	0	8499	2339	38.0	6961	801	13.0	1538	22.1
1996	5280	6390	0	0	8687	0	0	0	8687	2417	38.5	7083	813	13.0	1604	22.6
1997	5380	6530	0	0	8687	0	0	0	8687	2297	35.9	7221	831	13.0	1466	20.3
1998	5500	6660	0	0	8687	0	0	0	8687	2157	33.0	7444	914	14.0	1243	16.7
1999	5610	6710	0	0	8687	0	0	0	8687	2027	30.4	7593	933	14.0	1094	14.4
2000	5660	6840	0	0	8687	0	0	0	8687	1977	29.5	7715	1005	15.0	972	12.6
2001	5740	6960	0	0	8687	0	0	0	8687	1847	27.0	7864	1024	15.0	823	10.5
2002	5850	7120	0	0	8687	0	0	0	8687	1727	24.8	8070	1110	16.0	617	7.6
2003	5900	7190	0	0	8687	0	0	0	8687	1567	22.0	8261	1141	16.0	426	5.2
2004	5950	7260	0	0	8687	0	0	0	8687	1497	20.8	8337	1147	16.0	350	4.2
2005	5990	7330	0	0	8687	0	0	0	8687	1427	19.7	8423	1163	16.0	264	3.1
2006	6040	7400	0	0	8687	0	0	0	8687	1357	18.5	8502	1172	16.0	185	2.2
2007	6090	7480	600*	0	9287	0	0	0	9287	1287	17.4	8654	1254	17.0	33	0.4
2008	6140	7550	0	0	9287	0	0	0	9287	1807	24.2	8751	1271	17.0	536	6.1
2009	6190	7620	0	0	9287	0	0	0	9287	1737	23.0	8834	1284	17.0	453	5.1
2010	6240	7690	0	0	9287	0	0	0	9287	1667	21.9	8913	1293	17.0	374	4.2
										1597	20.8	8999	1309	17.0	288	3.2

* - NEW UNITS INSTALLED WHEN RESERVE OVER OBLIGATION FALLS BELOW 0.0%

(1) The Susquehanna units (1050 MW each) will be jointly owned by PP&L (90% - 945 MW) and Allegheny Electric Cooperative Inc. (AE) (10% - 105 MW). Since AE does not require all the capacity initially, PP&L will purchase capacity and energy from them through the late 1980's as shown under sales. In addition, PP&L has entered into an agreement with Atlantic City Electric Company (ACE) under which ACE will purchase, subject to FERC dates and ending in September 1991. This is also shown under sales.

(2) The Safe Harbor expansion (PP&L share 63 MW) was assumed to be completed in late 1985 and early 1986.

(3) The sales indicated reflect the effect of capacity arrangements with AE and ACE and an estimate of the effect of power supply arrangements with Luzerne Electric Division (LU) of UGI Corporation. For purposes of this report, the expected effects of the LU agreement are reflected as a reduction in PP&L's capacity.

(4) Estimates of capacity obligation are based on PJM allocation method, using reserve margin of PL group. Obligation and reserve above obligation are customarily presented in terms of summer rated capacity. The "Winter" obligation indicated here is an equivalent capacity obligation reflecting winter capacity ratings.

(5) The expansion of the Holtwood Project is assumed in-service in 1995.

(6) Average compound growth rate based on 1981 actual weather adjusted winter peak load exluding UGI. Peak actually occurred in January 1982.

Attachment 1
200-282066

R. R. Fortune
200.582027

Pennsylvania Power & Light Company
Response to Interrogatories of the
Susquehanna Alliance - Set III
Dated February 6, 1983

Docket No. R-822169

Q. 27. On pages 24-27 and 34-37 of Exhibit RRF-1 (Profile) various statistics regarding electric energy sales and operating information for the years 1966 to 1981 are provided. Please provide these same statistics for 1982.

A. 27. See Attachment 1.

ELECTRIC ENERGY SALES

	1982
Millions of KWH	
Residential	
Electrically heated homes	3,358
Other residential service	4,687
Total residential	8,045
Commercial	5,946
Industrial	7,324
Other	982
	22,297
Percent of Total	
Residential	
Electrically heated homes	15
Other residential service	21
Total residential	36
Commercial	27
Industrial	33
Other	4
	100
Percent Change Over Prior Year	
Residential	
Electrically heated homes	(1)
Other residential service	0
Total residential	(1)
Commercial	1
Industrial	(8)
Other	(2)
Total	(3)
Average Annual Residential KWH Use	
Electrically heated homes	18,611
Other residential service	6,606
Total residential	9,039

ELECTRIC CUSTOMERS AT YEAR-END

	1982
Residential	
Electrically heated homes	184,361
Other residential service	710,532
Total residential	894,893
Commercial	111,641
Industrial	5,725
Other	1,364
	1,013,623

ELECTRIC REVENUES

	1982
Components of Revenue from Energy Sales Billed	
(Thousands of Dollars)	
Base rates	$1,052,094
Fuel and energy clauses	142,315
Pennsylvania tax surcharge	67,838
Total from energy sales billed	$1,262,247
Total Revenue by Class of Service	
(Thousands of Dollars)	
Residential	
Electrically heated homes	$ 192,444
Other residential service	311,113
Total residential	503,557
Commercial	363,233
Industrial	347,726
Other energy sales	47,731
Total from energy sales billed	1,262,247
Unbilled revenues, net	(61,652)
Other operating revenues	12,708
Total	$1,213,303
Percent of Total	
Residential	
Electrically heated homes	15
Other residential service	25
Total residential	40
Commercial	29
Industrial	27
Other energy sales	4
Total from energy sales billed	100
Percent Change Over Prior Year	
Residential	
Electrically heated homes	26
Other residential service	20
Total residential	22
Commercial	24
Industrial	18
Other energy sales	21
Total from energy sales billed	21
Average Price Per KWH Billed (Cents)	
Residential	
Electrically heated homes	5.73
Other residential service	6.64
Total residential	6.26
Commercial	6.11
Industrial	4.75
Total—all customers	5.66
Total—ultimate customers (excludes sales to others for resale)	5.74

PP&L OPERATING INFORMATION

	1982
Sources of Energy (Millions of KWH)	
Generated	
Coal-fired steam stations	25,477
Nuclear steam station (a)	293
Oil-fired steam station	3,186
Combustion turbines and diesels (oil-fired)	13
Hydroelectric stations	612
Total generated	29,581
Power purchases	1,414
Total	30,995
Disposition of Energy (Millions of KWH)	
Energy sales to customers	22,297
Interchange power sales	6,900
Company uses and line losses	1,798
Total	30,995
Winter Capability (Thousands of KW)	
Coal-fired steam stations	4,145
Oil-fired steam station	1,640
Combustion turbines and diesels (oil-fired)	539
Hydroelectric stations	146
Firm purchase contract	76
Total at time of winter peak	6,546
Maximum One Hour Use (Thousands of KW)	
Summer peak	3,945
Winter peak (b)	4,489
Reserve Capability at Time of Winter Peak (%)	45.8
System Load Factor (%)	53.2

(a) The Company's first nuclear unit began generating electricity in November 1982.

(b) Peak was reached early in subsequent year.

PJM OPERATING INFORMATION

	1982
Capability (Thousands of KW)	
At time of summer peak (summer rating)	45,778
At time of winter peak (winter rating)	48,331
Maximum One Hour Use (Thousands of KW)	
Summer peak	33,741
Winter peak (a)	28,092
Reserve Capability (%)	
At time of summer peak	35.7
At time of winter peak	72.0

(a) Peak was reached early in subsequent year

PP&L TRANSACTIONS WITH PJM INTERCONNECTION

Millions of KWH	
Purchased	765
Sold	(6,552)
Net	(5,787)
Thousands of Dollars	
Purchased	$ 32,180
Sold	(290,499)
Installed capacity charges (credits)	
Net	$(258,319)
Cents per KWH	
Purchased	4.21
Sold	4.43

Various

Pennsylvania Power & Light Company
Response to Interrogatories
of the Office of Consumer Advocate
Set I - Capacity Requirements/Energy Savings
Dated January 3, 1983

Docket No. R-822169

Q.22. Please provide copies of all studies, reports, or other analyses used in developing the forecast inflation rates and fuel costs shown in Figure 10 of WFH-3. If informed judgement was relied upon, in whole or in part, please describe the considerations made and indicate why they were felt to be reasonable.

A.22. The forecasted inflation rates shown in Figure 10 of WFH-3 were obtained from Data Resources, Inc. These rates reflect their view and PP&L's view of the long-term expected growth rate of inflation as measured by the Wholesale Price Index.

The fossil fuel costs were taken from Exhibit 1 of the report "Long-Term Fossil Fuel Price Forecast" dated April 1982 (a copy is attached) and from information provided in response to Question 20 of this set.

The nuclear fuel costs were taken from Tables 1 and 2 which are attached. The data in these tables have been derived from data contained in the report" 1982 Susquehanna Nuclear Fuel Cost Report" dated June 1982.

EXHIBIT 1

FOSSIL FUEL PRICE FORECAST
EXPECTED SCENARIO
(Constant January 1982 Dollars)

		JANUARY 1982 ACTUAL	1982[1] DEREGULATED	1990 EXPECTED	2000 EXPECTED	2020 EXPECTED
World Price of Crude	($/BBL)	35.70	-	42.00	49.00	60.00
No. 6 1% FOB Marcus Hook	($/BBL)	31.00	34.00	48.00	58.00	67.50
	($/mmBTU)	5.00	5.50	7.70	9.30	10.80
No. 2 PP&L & Industrial Delivered	($/BBL)	43.00	43.00	53.00	63.70	80.90
	($/mmBTU)	7.40	7.40	9.10	10.90	13.90
No. 2 Residential Delivered @ 15¢/Gal. to Deliver	($/BBL)	51.00	50.00	59.80	70.50	87.90
	($/mmBTU)	8.70	8.60	10.30	12.10	15.10
Bituminous Coal, Central PA FOB Mine (Spot Market)	($/Ton)	33.00	40.00	47.00	50.50	62.40
	($/mmBTU)	1.30	1.60	1.88	2.00	2.50
Industrial Natural Gas	($/mmBTU)	3.50	5.50	7.70	9.30	10.80
Residential Natural Gas	($/mmBTU)	4.35	5.50	7.70	12.10	15.10
Coal Transportation to PP&L:						
Rail - (¢/Ton/Mile)[2]		4.90	-	5.30	6.50	9.50
Truck - (¢/Ton/Mile)[3]		7.60	-	9.20	11.30	16.70

[1] This column represents a long-term equilibrium January 1982 price if oil and natural gas had been deregulated and full cost recovered by coal and oil suppliers.

[2] Estimate of new route negotiated under current expectations.

[3] Based on an average distance of 50-60 miles. Beyond 100 miles, the 1981 incremental rate was 6¢/ton/mile.

FFD
ACM:bir

Susquehanna Unit #1
Nuclear Fuel Costs (mills/kwh) By Year

EXCLUDES SPENT FUEL DISPOSAL COSTS

Year	Direct Costs Less AFUDC	AFUDC	Total Direct Costs (Including AFUDC)	*Indirect Costs	Total Directs Plus Indirects
1983	3.90	1.02	4.92	1.56	6.48
1984	3.90	1.02	4.92	1.06	5.98
1985	4.19	1.04	5.23	1.50	6.73
1986	4.90	1.19	6.09	2.15	8.24
1987	6.00	1.32	7.32	2.29	9.61
1988	6.52	1.36	7.88	2.11	9.99
1989	7.24	1.38	8.62	2.44	11.06
1990	8.30	1.56	9.86	3.13	12.99
1991	9.23	1.68	10.91	3.21	14.13
1992	11.01	1.85	12.86	4.10	16.96
1993	12.62	1.95	14.57	5.18	19.75
1994	13.98	2.08	16.06	5.20	21.26
1995	16.20	2.31	18.51	6.42	24.93
1996	18.54	2.58	21.12	8.19	29.31
1997	20.28	2.83	23.11	8.15	31.26
1998	20.75	2.95	23.70	8.92	32.62
1999	23.48	3.42	26.90	11.20	38.10
2000	25.49	3.77	29.26	10.99	40.25
2001	28.89	4.36	33.25	13.23	46.48
2002	33.92	5.00	38.92	17.27	56.19
2003	37.99	5.50	43.49	17.53	61.02
2004	45.25	6.34	51.59	21.90	73.49
2005	53.48	7.24	60.72	28.00	88.72
2006	59.25	7.89	67.14	27.59	94.73
2007	68.38	8.97	77.35	33.15	110.50

TABLE 2

Susquehanna Unit #2
Nuclear Fuel Costs (mills/kwh) By Year

EXCLUDES SPENT FUEL DISPOSAL COSTS

Year	Direct Costs Less AFUDC	AFUDC	Total Direct Costs (Including AFUDC)	*Indirect Costs	Total Directs Plus Indirect
1984	4.98	1.39	6.37	2.17	8.54
1985	4.98	1.39	6.37	1.60	7.97
1986	5.21	1.27	6.48	2.34	8.82
1987	5.64	1.27	6.91	2.50	9.41
1988	6.78	1.29	8.07	2.42	10.49
1989	7.94	1.42	9.36	2.71	12.07
1990	9.54	1.55	11.09	3.67	14.76
1991	10.67	1.65	12.32	3.72	16.04
1992	12.38	1.78	14.16	4.52	18.68
1993	13.88	1.91	15.79	5.65	21.44
1994	15.20	2.06	17.26	5.63	22.89
1995	17.28	2.30	19.58	6.88	26.46
1996	19.92	2.61	22.53	8.87	31.40
1997	21.73	2.86	24.59	8.76	33.35
1998	22.10	2.94	25.04	9.50	34.54
1999	25.12	3.45	28.57	11.98	40.55
2000	27.38	3.81	31.19	11.81	43.00
2001	31.09	4.37	35.46	14.36	49.82
2002	37.11	5.07	42.18	19.03	61.21
2003	41.71	5.57	47.28	19.26	66.54
2004	49.53	6.38	55.91	23.90	79.81
2005	58.44	7.31	65.75	30.39	96.14
2006	64.45	7.91	72.36	29.72	102.08
2007	78.09	8.83	86.92	35.47	122.39
2008	83.46	9.96	93.42	43.26	136.68

Pennsylvania Power & Light Company
Response to Interrogatories
of the Susquehanna Alliance
Set III Dated February 6, 1983

Docket No. R-822169

Q.32. Please provide the costs and savings shown in the following figures but expressed in present value (i.e. 1983 uninflated dollars).

a) Figure 8 in Exhibit WFH 3

b) Figure 11 in Exhibit WFH 3

c) Figure 13 in Exhibit WFH 3

d) Figure 15 in Exhibit WFH 3

e) Figure 1 in response to interrogatory of OCA (200.282099)

f) Figure 42-1 in response to interrogatory of OCA (200.282100)

A.32. The information requested above is provided in the table attached.

INTERROGATORY #32

NET SAVINGS DUE TO SUSQUEHANNA SES IN $ MILLIONS

Year	CURRENT $ a	b	c	d	e	f	UNINFLATED* 1983 $ a	b	c	d	e	f
1983	-154	-165	-160	-156	-174	-170	-154	-165	-160	-156	-174	-170
1984	-294	-316	-300	-298	-330	-323	-272	-293	-278	-276	-306	-299
1985	-413	-476	-456	-441	-537	-499	-354	-408	-391	-378	-460	-428
1986	-358	-429	-417	-403	-513	-468	-284	-341	-331	-320	-407	-372
1987	-250	-328	-334	-322	-456	-389	-184	-241	-245	-237	-335	-286
1988	-102	-194	-210	-206	-365	-284	- 69	-132	-143	-140	-248	-193
1989	44	- 59	-129	-104	-318	-191	28	- 37	- 81	- 66	-200	-120
1990	213	85	- 39	14	-276	- 87	124	50	- 23	8	-161	- 51
1991	311	163	17	90	-229	- 29	171	90	15	50	-126	- 16
1992	394	232	39	122	-254	- 4	205	120	20	63	-132	- 2
1993	519	332	64	207	-267	64	254	163	31	101	-131	31
1994	717	508	161	348	-205	187	331	235	74	161	- 95	86
1995	816	592	210	385	-200	218	356	258	92	168	- 87	95
1996	978	731	282	497	-166	315	404	302	117	205	- 69	130
1997	1158	887	361	622	-129	422	454	347	141	244	- 51	165
1998	1360	1062	451	763	- 85	543	505	394	167	283	- 32	202
1999	1577	1249	540	911	- 44	671	555	440	190	321	- 15	236
2000	1816	1456	637	1074	- 1	811	606	486	213	358	0	271
2001	2068	1671	728	1241	32	953	654	528	230	392	10	301
2002	2343	1907	824	1421	65	1106	702	572	247	426	19	322

*inflation rate assumptions: 8% through 1990; 6% from 1990-95 and 5.5% after 1995

a: Figure 8 in Exhibit WFH3 - base case

b: Figure 11 in Exhibit WFH3 - reduced Susq. SES capacity factor

c: Figure 13 in Exhibit WFH3 - reduced load growth rates

d: Figure 15 in Exhibit WFH3 - reduced rate of increase in fossil fuel prices

e: Figure 1 in response to interrogatory of OCA (200.282099) - comb. b, c and d

f: Figure 42-1 in response to interrogatory of OCA (200.282100) - comb. b and X d

200.582033
W. F. Hecht

Pennsylvania Power & Light Company
Response to Interrogatories
of the Susquehanna Alliance
Set III Dated February 6, 1983

Docket No. R-822169

Q.33. Please provide the results of the analysis employed in WFH 3 which assume the low capacity factor assumption and the low load growth assumption. Please provide the results in both current dollars and present value as indicated in interrogatory 32 above.

A.33. The results of an analysis which combine the assumption of a reduced Susquehanna SES capacity factor and a reduction in load growth rates are listed in Attachment 1 and are plotted in Attachment 2.

PP&L NET BENEFITS OF SUSQUEHANNA SES
WITH REDUCED SSES CAPACITY FACTOR (1)
AND REDUCTION IN LOAD GROWTH RATES (2)
(MILLIONS OF DOLLARS)

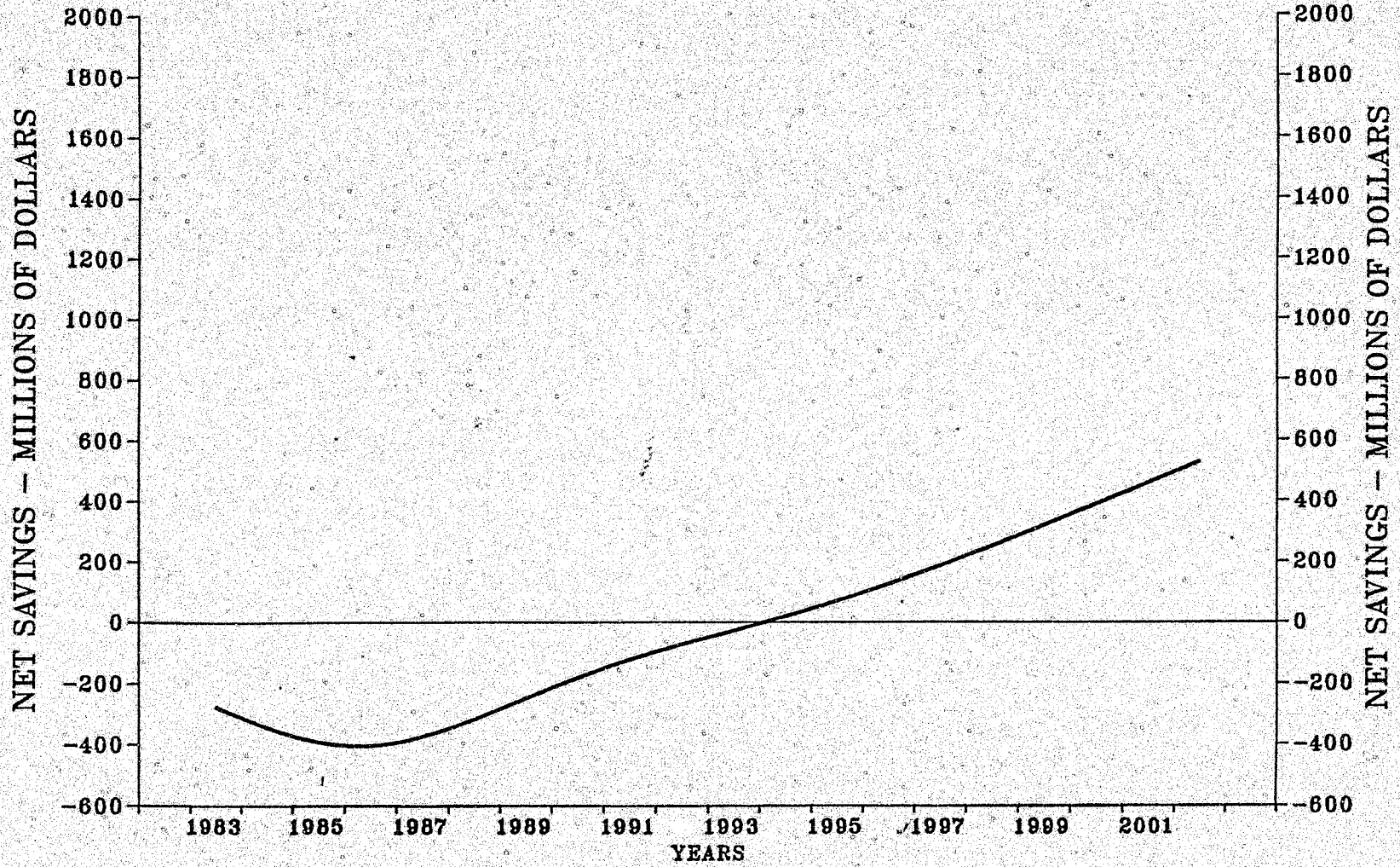
	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL SUSQUEHANNA SES CAPITAL & O&M COSTS	231	421	790	795	802	795	800	807	827	892	910	937	956	971	986	998	1017	1037	1071	1110
TOTAL PP&L OPERATING SAVINGS	58	94	275	313	398	506	584	661	747	817	844	964	1020	1091	1168	1250	1337	1431	1531	1638
NET PP&L SAVINGS: CURRENT $	-173	-327	-515	-482	-404	-289	-216	-146	- 80	- 75	- 66	27	64	120	182	252	320	394	460	528
NET PP&L SAVINGS: UNINFLATED $	-173	-303	-442	-383	-297	-197	-136	- 85	- 44	- 39	- 32	12	28	50	71	94	113	131	145	158

(1) SSES CAPACITY FACTOR REDUCED 10 PERCENTILE FROM BASE CASE EACH YEAR.

(2) PP&L ANNUAL PEAK LOAD GROWTH RATE REDUCED FROM 1.8% TO 0.8% WITH SIMILAR REDUCTIONS TO PJM LOAD.

Attachment 1
200.582033

PP&L NET SAVINGS DUE TO SUSQUEHANNA SES WITH A REDUCED SSES CAPACITY FACTOR (1) AND REDUCTION IN LOAD GROWTH RATES (2) -- PROJECTED OVER TIME --



(1) SSES CAPACITY FACTOR REDUCED 10 PERCENTILE FROM BASE CASE EACH YEAR.
(2) PP&L ANNUAL PEAK LOAD GROWTH RATE REDUCED FROM 1.8% TO 0.8% WITH SIMILAR REDUCTIONS TO PJM LOAD.

Attachment 2
200.582033

Pennsylvania Power & Light Company
Response to Interrogatories
of the Susquehanna Alliance
Set II Dated February 6, 1983

Docket No. R-822169

Q.14. Please provide a table for all BWR's in operation through 1982 showing the capacity factor for each calendar year from 1971 through 1982.

A.14. Table A shows capacity factors for the 20 BWR-3's and BWR-4's by calendar year through September, 1982. (Numbers in parentheses on all tables indicate the number of unit-months, where different from 12.)

Table A

BWR 3+4 CAPACITY FACTORS BY CALENDAR YEAR (Through 9/82)

GENERAL ELECTRIC BWR-3 NUCLEAR UNITS

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Dresden 2	-	-	58.1(6)	72.1	48.9	42.5	62.7	50.9	82.0	71.1	65.7	49.1	79.5(9)
Millstone Point 1	-	70.4(9)	54.6	32.5	62.3	67.4	64.8	83.4	80.5	73.1	58.6	43.7	79.5(9)
Monticello	-	49.2(5)	74.4	68.5	61 3	60.4	83.3	74.8	80.8	92.2	72.2	68.3	66.4(9)
Dresden 3	-	-	71.1(12)	53.2	46.2	31.7	57.9	74.6	55.1	50.1	63.0	74.4	47.7(9)
Pilgrim 1	-	-	-	69.6(12)	33.7	44.2	41.2	45.3	74.8	82.8	51.9	58.9	50.8(9)
Quad Cities 1	-	-	-	70.0(10)	50.1	61.8	49.1	51.0	68.3	69.3	50.1	82.9	62.4(9)
Quad Cities 2	-	-	-	73.6(9)	64.7	36.1	62.3	63.2	64.1	57.8	52.7	54.6	71.6(9)

GENERAL ELECTRIC BWR-4 NUCLEAR UNITS

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Vermont Yankee	-	-	44.3(1)	40.3	55.1	79.1	72.2	78.6	72.0	76.6	66.0	79.3	92.0(9)
Peach Bottom 2	-	-	-	-	76.5(5)	54.5	59.7	43.4	72.8	91.9	46.8	71.1	41.1(9)
Browns Ferry 1	-	-	-	-	70.7(5)	14.8	13.9	54.1	62.4	80.3	64.9	47.2	82.8(9)
Cooper Station	-	-	-	-	50.6(6)	56.5	53.3	66.6	71.7	73.3	55.4	56.5	71.7(9)
Duane Arnold	-	-	-	-	-	50.9(11)	55.0	64.3	26.0	61.5	61.8	49.2	48.7(9)
Browns Ferry 2	-	-	-	-	-	7.0(10)	16.8	66.7	59.5	79.8	60.1	80.1	63.8(9)
Peach Bottom 3	-	-	-	-	-	56.6(12)	64.7	51.3	74.7	65.5	77.3	34.0	91.3(9)
Hatch 1	-	-	-	-	-	-	59.8(12)	54.0	62.1	48.6	69.5	40.2	53.7(9)
Fitzpatrick	-	-	-	-	-	50.4(5)	57.6	54.1	58.4	41.2	60.1	66.5	67.5(9)
Brunswick 2	-	-	-	-	-	63.7(1)	34.5	33.9	66.7	50.8	26.0	45.7	25.3(9)
Browns Ferry 3	-	-	-	-	-	-	-	74.8(10)	59.5	58.8	74.1	67.1	38.0(9)
Brunswick 1	-	-	-	-	-	-	-	42.0(9)	71.2	44.1	54.6	35.8	43.4(9)
Hatch 2	-	-	-	-	-	-	-	-	-	85.4(3)	53.1	65.3	42.1(9)
BWR 3+4 Avg.*	-	62.8	65.0	59.3	54.5	48.0	53.5	59.4	66.5	67.0	59.2	58.5	61.0

*Through September, 1982

Attachment 1
200.582014

Pennsylvania Power & Light Company
Response to Interrogatories
of the Susquehanna Alliance
Set II Dated February 6, 1983

Docket No. R-822169

Q.15. Please provide a table for all BWR's in operation through 1982 showing the capacity factor for each year of its commercial operation (i.e. year 1, year 2,...).

A.15. Table B (two sheets) shows capacity factors for the 20 BWR-3's and BWR-4's by year-of-operation, through September, 1982.

Table B

CAPACITY FACTORS FOR NUCLEAR UNITS

GENERAL ELECTRIC: BWR-3 NUCLEAR UNITS

	Size (MWe)	Factor	1	2	3	4	5	6	7	8	9	10	11	12	Unit Average
Dresden 2	794	CF	66.9	67.2	22.0	58.5	76.8	56.7	68.9	83.9	32.1	84.9	62.5(3)		61.8
Millstone Point I	660	CF	69.8	41.0	47.0	63.6	66.3	69.2	77.3	82.8	72.4	40.6	65.5	75.1(6)	63.8
Monticello	545	CF	57.7	70.9	64.6	74.8	67.1	85.9	73.7	81.7	73.7	84.3	66.8	31.9(2)	72.2
Dresden 3	794	CF	71.1	53.2	46.2	31.7	57.9	74.6	55.1	50.1	63.0	74.4	47.7(9)		57.1
Pilgrim 1	668	CF	69.6	33.7	44.2	41.2	45.3	74.8	82.8	51.9	58.9	50.8(9)			55.5
Quad Cities 1	789	CF	70.2	41.4	58.9	60.8	52.3	57.1	82.1	49.0	83.7	54.5(7)			61.3
Quad Cities 2	789	CF	74.4	45.7	55.6	57.7	54.7	77.3	38.2	74.6	43.9	85.8(6)			59.4

CAPACITY FACTORS FOR NUCLEAR UNITS

GENERAL ELECTRIC: BWR-4 NUCLEAR UNITS

	Size (MWe)	Factor	1	2	3	4	5	6	7	8	9	10	11	12	Unit Average
Vermont Yankee	514	CF	39.2	56.6	74.1	72.1	79.4	71.5	76.1	74.4	73.7	89.4(10)			70.4
Peach Bottom 2	1065	CF	68.8	46.0	52.9	68.1	78.3	53.0	70.1	52.2	80.6(2)				61.6
Browns Ferry 1	1065	CF	44.4	0.0	58.6	53.5	63.6	61.2	64.5	71.1	73.1(2)				52.5
Cooper Station	778	CF	60.1	51.3	59.8	60.1	74.7	59.9	63.4	64.2	75.8(3)				62.1
Duane Arnold	515	CF	53.3	54.8	64.1	19.6	68.6	63.0	47.8	44.5(8)					52.3
Browns Ferry 2	1065	CF	5.9	31.4	64.5	62.4	74.7	64.4	78.9	58.5(7)					54.9
Peach Bottom 3	1065	CF	56.6	64.7	51.3	74.7	65.5	77.3	34.0	91.3(9)					63.6
Hatch 1	786	CF	59.8	54.0	62.1	48.6	69.4	40.2	53.7(9)						55.5
Fitzpatrick	821	CF	48.5	64.3	66.5	28.6	51.6	82.9	51.4	94.3(2)					57.1
Brunswick 2	821	CF	37.4	36.4	59.4	52.0	29.5	42.2	30.0(10)						41.2
Browns Ferry 3	1065	CF	76.8	60.6	54.4	71.4	59.2	48.5(7)							62.8
Brunswick 1	821	CF	47.5	58.2	61.8	49.5	37.1	31.4(6)							49.1
Hatch 2	784	CF	67.8	51.5	52.0										57.1
AEG. CF FOR ALL BWR-3-4			57.3	49.1	56.0	55.2	61.7	63.9	62.1	67.1	63.6	70.7	61.2	64.3	
UNIT YEARS			20.0	20.0	20.0	19.0	19.0	18.1	16.6	13.2	8.6	6.7	3.0	0.7	

Pennsylvania Power & Light Company

Response to Interrogatories
of the PUC Trial Staff-Set IX
Dated: January 17, 1983

Docket No. R-822169

Q.E-27 Refer to response to E-8 and to Attachment 2 of the direct testimony of B. D. Kenyon. Provide support by major components for each of the following annualized expenses:

		$(000's)
a)	materials and supplies	4,493
b)	work by outsiders	5,992
c)	services	4,411

A.E-27 A breakdown of these Budget Items by major cost component is provided in the attached tables.

Answer: E-27 a

The following table is a list of items that represent the major cost components of Budget Item 25-Materials and Supplies. Since the items were budgeted in 100% dollars, the table shows both the budgeted 100% amount and the corresponding PP&L 90% share.

Item Description	($ x 1000) 90%	100%
Consumables		
Radwaste Materials		
Radwaste Resins	404.4	449.3
Drums and Liners	381.1	423.4
Cement	14.2	15.8
Gases and Fuels	120.2	133.6
Sulfuric Acid	106.4	118.2
Other Chemicals/Supplies	197.9	219.9
Storeroom Items	86.7	96.3
Spare Parts		
Mechanical/Electrical Spares	302.8	336.5
Valves and Valve Parts	124.4	138.3
Instruments and I&C Spares	445.7	495.2
Special Spares and Materials	117.1	130.1
Equipment, Equipment Spares and Other Materials	214.3	238.1
Other Materials	292.6	325.1
Total	2,807.8	3,119.8
Annualization is calculated by multiplication of the 90% total by 1.6.	x 1.6	
	4,493.0	

Answer: E-27 b

The following table is a list of items over $50,000 that represent the major components of Budget Item 32 - Work by Outsiders. Since the items were budgeted in 100% dollars, the table shows both the budgeted 100% amount and the corresponding PP&L 90% share.

Item Description	($ x 1000) 90%	100%
Disposal of Low Level Radwaste		
Transportation	792.9	881.0
Burial	619.0	687.8
Maintenance of Equipment		
Welding		
Motor/Generator Repairs		
Transformer Repairs	481.3	534.8
Pump/Diesel Servicing		
Decontamination		
Chemical Cleaning		
Laundry Services for Protective Clothing	425.3	472.6
Assistance for Plant Staff		
Health Physics	360.0	400.0
Instrumentation & Controls	54.9	61.0
Chemistry	54.7	60.8
Employee's Physical Exams	71.1	79.0
GPA Maintenance Contractor	577.5	641.7
Other	308.4	342.6
Total	3,745.1	4,161.3
Annualization is calculated by multiplication of the 90% total by 1.6.	x 1.6	
	5,992.2	

Answer: E-27 c

The following table is a list of items over $50,000 that represent the major components of Budget Item 33-Services. Since the items were budgeted in 100% dollars, the table shows both the budgeted 100% amount and the corresponding PP&L 90% share.

Item Description	($ x 1000) 90%	100%
Environmental		
Ecological Monitoring	391.7	435.1
Radioactivity in SSES Environment	251.4	279.4
Radiological Monitoring	183.9	204.4
Maintenance		
Engineering Support	304.9	338.8
Inspections for Maintenance QA	96.3	107.0
Instr. & Controls Maintenance Program	61.2	68.0
1-3 Year Procurement Approval Cycles	90.0	100.0
Planning		
Plant Staff Scheduling Needs	168.8	187.5
Outage Planning	109.8	122.0
Operations		
Nuclear QA During Operations	91.8	102.0
Review & Revise Plant Admin. Procedures	58.5	65.0
Emergency		
Emergency Plans & Drills	69.4	77.1
Upgrade Emergency Plan	61.1	67.8
Security Clearance Services	77.0	85.5
Personnel Placement		
Executrans Fees	54.8	60.9
Agencies-Candidate Searches	54.7	60.8
Physicians-Pre-Employment Physicals	54.7	60.8
Other	577.4	641.7
Total	2,757.4	3,063.8
Annualization is calculated by multiplication of the 90% total by 1.6.	x 1.6	
	4,411.8	