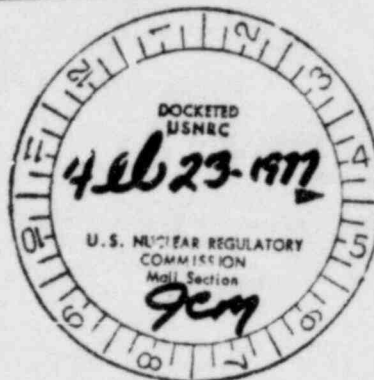


NUCLEAR REGULATORY COMMISSION

Regulatory Docket File

IN THE MATTER OF:

CONSUMERS POWER COMPANY  
(Midland Units 1 and 2)



Docket Nos. 50-329  
50-330

THIS DOCUMENT CONTAINS  
POOR QUALITY PAGES

Place - Chicago, Illinois

Date - Wednesday, 16 February 1977 Pages 4331 - 4500

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In the matter of:	:	
	:	Docket Nos. 50-329
CONSUMERS POWER COMPANY	:	50-330
	:	
(Midland Units 1 and 2)	:	
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Room 2503  
Everett M. Dirksen Building  
219 South Dearborn Street  
Chicago, Illinois

Wednesday, 16 February 1977

Hearing in the above-entitled matter was recon-  
vened, pursuant to adjournment, at 9:30 a.m.,

BEFORE:

- FREDERIC J. COUFAL, Esq., Chairman
- DR. J. VENN LEBDS, Member
- DR. EMMETH LUEBKE, Member

APPEARANCES:

(As heretofore noted.)

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C O N T E N T S

					CR. ON
<u>WITNESSES</u>	<u>DIRECT</u>	<u>CROSS</u>	<u>REDIRECT</u>	<u>REGROSS</u>	<u>BOARD BOARD</u>
Sidney E. Feld	4365	4392			4471
			4482	4487	4488
			4505		4480
					4492
Sidney E. Feld	4511	4516			4546
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EXHIBITSUNCLASSIFIEDRECEIVED

Midland Int's. 49 (Heins Memo  
to File, 10/5/76)

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P R O C E E D I N G S

CHAIRMAN COUFAL: Good morning, ladies and gentlemen.

Let the record show Mr. Cherry is here for Interveners other than Dow, Mr. Hoefling and Mr. Brenner for the Staff, Mr. Renfrow for the Licensee, and Mr. Nute and Mr. Pribilla for Dow.

Yesterday evening just before we broke the Staff asked if the Board had any objection to their proceeding with an investigation which they felt they should make with regard to certain aspects of the preparation of the Dow case, and included references to items such as the -- quote -- Nute notes. I said if Mr. Nute's first name were Nate, then we could have "Nate Nute's notes."

MR. CHERRY: Gee.

CHAIRMAN COUFAL: I'm sorry, Mr. Cherry. I've got a cold. That's the best I can do.

MR. CHERRY: No, it was very funny, "Nate Nute's notes."

CHAIRMAN COUFAL: We also called the parties yesterday, Mr. Cherry's office and Mr. Renfrow's office, and advised them that we had released certain documents, and we promised a statement of the reasons for the release in the record this morning. And Dr. Leeds will indicate that for the record.

DR. LEEDS: Yesterday the material that was released was described in Attachment A to the Bayless affidavit of the 7th of February, and we released it on the 14th of February 1977. And our reasons are as follows:

First, the type of information is simply not that kind of information which would cause significant harm to Licensee. The affidavit itself fails to establish the amount of harm, and only speaks of a generalized claim upon the data or general estimates of costs.

In a free enterprise system when you have several suppliers, the market will determine the price.

Furthermore, the data, the material, is background basic material to the cost-benefit balance, and which this Board will eventually have to do.

And last, the tendency is to disclose material unless a clear and significant harm to the holder of the data is shown. We didn't find that showing.

And now, with respect to the other materials which are subject to the Bayless affidavit of the 9th of February 1977, I first have to talk to Mr. Renfrow for a second about what's what in here, because it's not completely identified and the Board has had some trouble trying to spot these documents.

First, Mr. Renfrow, can you tell me where FC30-001 is? We didn't find it marked. Let me show you a document

which I think may well be FC30-001. It was in the package, unmarked.

MR. RENFROW: Yes, sir, that's correct. And the reason you're having difficulty is that I released the first part of this document. Those are the calculations that go to Mr. Heins' testimony, and this followed that. We released the first half of the document, but not this part.

DR. LEEDS: So this is FC30-001?

MR. RENFROW: Yes, sir, the second half.

DR. LEEDS: Okay. I have one more question.

Now, there's another document which I'll describe for the record as being three inches thick, separated roughly at half-inch increments by index tabs, and the first sheet of it says, "Consumers Power Company Nuclear Fuel Supply Department, Schedule of Nuclear Fuel Requirements by Plants, 34-year forecast." What is this document?

MR. RENFROW: That is the source document that goes with FC019, which is the NM Square. That is the . . . let's see if I can give the right word . . . it's the source term for the program for the NM Square, and it has the relationships back and forth to tie each of the parts together, and how they interrelate.

But the NM Square was on top of this one.

DR. LEEDS: Okay. So this is part of NM Square?

MR. RENFROW: Yes, sir.

DR. LEEDS: All right. Now, let me ask you another one. The document that was identified as FC30-015 has inside an identification on page 3-5. This is a main program, but no other identification. And it's a computer program and does not fit, so far as I can see, with the statement that Attachment A is cost estimates. What is that for?

MR. BENEROW: I believe, Dr. Leeds, that this is the CONFUCY program.

DR. LEEDS: I looked all over, and I couldn't find CONFUCY, because that's what I thought it was.

All right, why don't you hold onto that one, then, and we'll find out what that is, because if you don't know we do not want to make a ruling on it.

MR. BENEROW: Okay. I can find out for you very shortly. I believe that's CONFUCY. If you'll let me borrow this for a minute, I'll have Mr. Keeley call Mr. Bayless and make sure that this is CONFUCY.

DR. LEEDS: Okay, let's get those other things done first.

Now, there's another collection of documents in Attachment A that are marked FC30, and the numbers are FC30-014, 015, 016 and 017. The Board has looked at these documents and does not completely understand what they represent, or what they are. And we would propose not to release them unless you tell us -- we propose to release them unless you tell us

in some detail what they actually represent. So I'll give these back to you, too, at the same time.

MR. BENEROW: Okay.

DR. LEEDS: All right, that's it. We'll make the rulings on these.

The Board is going to release documents in the Bayless affidavit that start with the numbers FC30. And they all have that number, and then there's another number attached to it. So, for example, we're going to release FC30-24 and FC30-18. Then 23, 20, 19, 21, 26, 010 and 001.

These documents appear to the Board to be similar to the documents that were released yesterday, and we would release them for the same reasons.

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MR. BRENNER: I'm sorry, Dr. Leeds. Could I ask you to run down that list again?

DR. LEEDS: Yes, be glad to. Let me do it slower.

They all have the subscript FC30, and I will just list the numbers. They're out of order.

024, 018, 023, 020, 019, 021, 026, 010, 001. They all look the same -- they all look similar on the printout in front. In other words, they have something to the effect Midland 1 or Midland 2, delay, and then input data, plutonium uranium cycle.

MR. BRENNER: Just as a double check, Dr. Leeds, I have a total of nine documents that you just read off on



that?

DR. LEEDS: That's correct. One of which, gentlemen, is marked differently. In the top of the page is Nuclear Fuel Cycle Cost Estimates, Cost Allocated, in the period fuel was producing energy in mills per kilowatt hour. And it's not marked, but I understand from Mr. Renfrow just then, that that document is FC30-001. There's no date on it, so I can't identify it further. In the lower left-hand corner is a circled 5 written in pencil.

Maybe you could speak to Mr. Renfrow to make sure we're talking about the same documents, because he knows which ones.

The Board is not releasing at this time FC30-025. We want some further information on what that is, nor are we releasing the documents FC30-14, 15, 16 and 17.

The Board rules that computer program NM Square is proprietary, and we will not release that.

That does it.

MR. RENFROW: Dr. Leeds, excuse me. The documents that the Board has released, FC 30 documents, are the CONEUCY programs that were run to give fuel costs for Midland. They include as input the output from NM Square, printed out on them.

I would request two things:

One, because the output from NM Square, as well as

the program, is claimed to be proprietary since the program and source document have not been released, that the Board reconsider its ruling on the CONFUCY documents.

Second of all, if this Board overrules that, then I would request that the Board stay its order requiring me to release those documents and certify the question to the Appeal Board. I ask that for two reasons:

One is the Staff stated in its reply to the Board this is the first time, I believe, to the best of my knowledge, it is the first time when a Board has been faced with internally generated cost information by a utility that goes not only to price of yellowcake, but also to the processing, storage, transportation, as to what they expect to pay in the future.

While I appreciate the remarks about a free enterprise system, I would remind this Board that right now the demand is outstripping the supply, and I believe by definition under economic terms that is not a truly free enterprise system.

Therefore, I would request, prior to you requiring me to release these documents, that you certify the question as to whether or not they are indeed proprietary. I would note for you that I am making the distinction between contracts which establish price, which I have indeed turned over and not claimed to be proprietary, and internally generated cost

estimates based on research done in house, which include all elements of the entire fuel cycle. To the best of my knowledge, no Licensing Board or Appeal Board has ever ruled on that point, and indeed this is the first time it's come up. And it will be a matter of first impression. I believe that this is a proper matter for certification. If the Board grants that request, I believe that we can file before the Appeal Board by the end of next week any brief that we have to support that claim. It could be resolved in an expeditious fashion.

I would remind the Board that once they require me to release them, then the question itself becomes moot because the information is available.

I would also state to the Board that if they grant my request, one way that they could grant it would be to release the documents under a proprietary order pending the Appeal Board's review of those documents. In that way, the parties would have the documents and we could go forward with this portion of the hearing. But it would still protect my rights, since this is a question of first impression on appeal.

DR. LEEDS: Let me ask you a question, Mr. Randrow. Why did you not supply to the Board in the Bayless affidavit more supporting information than the three generalized statements that you made, so we could find out the direct harm,

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the amount of harm, an estimate of the amount of harm if you had no direct indication of it, and additional information on which we might evaluate them?

Because, you see, as I read the Bayless affidavit it essentially says what you have argued in the past, as I read parts of it.

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MR. RENFROW: The amount of harm, Dr. Leeds; it is very hard to say it is going to be X amount of dollars. For example, I have stated to you in the past that NM Square, which you felt to be proprietary, is in the process of being sold to other utilities. And indeed, they are close to a contract with another utility for the sale of that document.

Now I could give you the negotiated price of that document, but I don't think that is what you are looking for. I can't put a number value on what it would cost consumers in the future in terms of their negotiations for transportation, yellowcake, enrichment. I can't give you that precise number.

What I have tried to supply you through the Bayless Affidavit is information that; one, the costs are internally generated; two, they are different from contracts, and three, because of the situation that we find ourselves in in today's marketplace, that damage, that I can't specify for you in terms of actual dollar amounts, would result if this information was released.

MR. CHERRY: Can I be heard?

CHAIRMAN COUFAL: Sure.

Are you through, Mr. Renfrow?

RENFROW: I have answered Dr. Leeds' question.

MR. CHERRY: I am sorry.

DR. LEEDS: You are asking the Board for a ruling to stay our order; right?

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MR. RENFROW: That is correct.

MR. CHERRY: Mr. Chairman, I would oppose that request. There is the traditional rule on proprietary information, which is that you provide information, either evidentiary or by way of an affidavit and if there is insufficient information in that affidavit as the Board has found, then the material is properly released as the Board has just suggested.

The motion for reconsideration doesn't really raise any new issues at all. It just says you were wrong on your motion for -- on your original decision, and we are going to hurt in the same ungeneralized -- generalized claims are made.

What Mr. Renfrow is really saying to you is that he thinks you are wrong and that he thinks he is right, and he would like some more time.

But the time also has prejudicial advantages. I want that information now. As a matter of fact, you will recall, Mr. Chairman, that the information attached to the Bayless Affidavit was tendered to me some four or five days ago and I refused to take it on the grounds that I didn't want to take any material that hadn't been ruled upon for proprietary.

That meant that Consumers Power Company had a copy of those documents. Yesterday at about 4:00 o'clock, I telephoned Mr. Renfrow, Mr. Rosso and Ms. Bartelman and I said: Please arrange for those documents to get over to me as soon as

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possible.

This morning I asked -- I never heard from them -- this morning I asked Mr. Renfrow where the documents were and he said: Well, they were copying them. Well, they were copied because they were tendered to me once before.

And I think that what Consumers Power Company is doing here is no different than what they have done all the time. They have determined what they want to do. And anybody who stands in their way will get polite smiles and all of the other kind of stuff that we have learned in society that sometimes has a mask hidden behind it; that we are not going to get the information, et cetera.

This is not a novel question. This involves a factual interpretation and you have made that factual interpretation.

The Appeal Board has already set out what the law is surrounding it, so there is no need to certify this question and there has been no showing by Mr. Renfrow that this will harm his company in any way. He has attempted to make that showing through the affidavit. The affidavit has been challenged. He has not offered, subsequent to the filing of that affidavit, to bring any further information. He had Mr. Bayless here. He could have put Mr. Bayless on the stand, or offered to put Mr. Bayless on the stand if he really wanted to have information. He never made that request. All

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he did was turn around to the Board and say: Do you want another witness? But he never affirmatively did it.

Mr. Renfrow has now admitted that he cannot make an approximate cause relationship between the release of this information and in any damage to Consumers Power, because as the Board found as a matter of law, it does not exist.

And I do not believe the company will be hurt by the release of this information. If I thought that Consumers Power Company would be hurt in the release of this information, that it would raise prices, I would be the first to suggest some method where that couldn't happen.

But this is just a series of claims made all over the country by utilities that matters which they don't want out for one reason or another, are proprietary. And they are not, and I would urge the Board promptly to deny reconsideration, deny the request for certification and turn over those documents immediately.

MR. RENFROW: Mr. Chairman, I would like to respond briefly to that. I believe you do have some confusions.

There are two sets of proprietary information. I have all of the copies of the second set of information which is the material ruled upon today by Dr. Leeds.

The set that Mr. Cherry is referring to is the smaller set that came out of privileged documents that were previously done.

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I cannot -- if I ever had extra copies of these, they will be over here very shortly and I will give the parties -- I believe the Staff already has a copy. I had copies made for Mr. Cherry and for Mr. Wynn.

We are not going to challenge the ruling of the Board as to that first affidavit.

DR. LEEDS: That is the 7th of February affidavit?

MR. REEFROW: That is the 7th of February affidavit.

We do request on this one, and because I do not believe that Mr. Cherry has stated it correctly to you; the Appeal Board has not ruled on internally estimated cost data. They ruled on contracts and we have turned over all of our contracts with no claim of proprietary. And the Board and the parties have that information.

It is on the limited area that I am making the request. Mr. Cherry says I am telling you I think you are wrong. Well, I guess in a way that is exactly what I am telling you; that I do believe that that is wrong. I would like a chance for the Appeal Board to resolve the question.

And if I have to turn over the documents before I get that opportunity, that is noted.

And finally, you can handle that problem so that there is no prejudice by merely releasing them as proprietary to the parties until I have an opportunity go before the Appeals Board and request their ruling on it.

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If I do not get that relief, I have no choice about moving forward, because the uniqueness of the documents will already have been lost.

MR. CHERAZ: Mr. Chairman, I would only add that that is the way the system works. I am sitting here while a plant is being constructed after I one the case in the Court Appeals.

What relief do I get out of that? And the Atomic Safety and Licensing Board makes decisions immediately effective while you go up to the Appeal Board. No one ever seems concerned about the people who oppose those plants.

I do not believe that you should change your ruling. I would urge you to deny reconsideration.

The issues have already been decided by you and it is based on a factual record which this Board has already determined is insufficient for proprietary claim. I agree with it. It is supportable. It will not be reversed. There is no need now to ask the Appeal Board for guidance because this is not an issue in which there is no law to apply. This Board has applied the law.

CHAIRMAN COUFAL: Staff, do you have any comments?

MR. HOEFLING: Yes, Mr. Chairman.

I think Mr. Rensfrew's position may deserve some consideration. He is basically saying: If this material is released the question is moot. And he is seeking an opportunity

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to have the question reexamined.

One aspect that troubles the Staff is the sufficiency of the Bayless Affidavit in the first instance. The Staff made the point that it felt that those affidavits were rather scant and just did not provide the kind of basis that it appears the Appeal Board in laying out the Wolf Creek standards anticipated should be laid in order to enable the Board to make a ruling.

In reading the Wolf Creek decision, the Appeal Board seems to contemplate a significant showing of commercial injury. And in the Bayless affidavit, the Staff didn't make that out.

Perhaps consideration should be given to permitting Mr. Renfrow to supplement the showing that has been made by the Bayless Affidavit to provide more information to the Board as to the significance of the injury.

With the state of the record right now, it would appear that the Board's ruling is correct.

DR. LEEDS: Just a comment:

The Board's ruling has permitted certain pieces of information, to bring additional information which it wasn't clear on the documents themselves or the affidavit, what the status was of them.

In fact, one of them was a computer program with no identifying marks other than the fact that it said name,

and we just didn't know from looking at it whether it was part of NM Square or revision of NM Square or anything like that.

So we are in a sense doing what you are saying with respect to part of the documents.

I wanted to make sure that was clear on the record. I am not criticizing you, Mr. Hoefling. I am just making a comment there.

MR. RENFROW: I would point out to the Board once again that when we get back to the Bayless Affidavit, I have a little problem with Wolf Creek.

If I was trying to support before this Board to keep contracts out of the public nature, then certainly under the Wolf Creek standards I would have a tremendous burden to meet.

With regard to NM Square, that document and the commercial injury that will result, is apparent it is there. And it is the same material, Dr. Leeds, that you and I had the conversation about which is reprinted as inputs to the CONFUCY program which you were going to release --

DR. LEEDS: Well, we have held that NM Square is proprietary.

MR. RENFROW: Yes, sir, but you have also ruled to release the CONFUCY program which has the same information that comes from NM Square as input into that program.

DR. LEEDS: Now where is the CONFUCY Program

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released? I held back document FC -- what ever the number is. The Board held back FC-025 and said: Come tell us more.

Isn't that the CONFUCY Program?

MR. RENFROW: Well, no, sir. Once again, we went through this because of the --

DR. LEEDS: I will say this: For lack of information you provided us, it was very difficult for the Board to sort out what was what.

MR. RENFROW: Yes, sir, and you and I had a long conversation about how this fit together and that's why I brought Mr. Bayless over here.

The documents that you have given me are the delay case documents. And this is the CONFUCY Program upon which it is run.

DR. LEEDS: That's correct.

MR. RENFROW: But the documents that you have released are the base case documents with the same program, the same CONFUCY Program.

DR. LEEDS: There is no program attached to the Board documents. There is only data, only numbers.

MR. RENFROW: That's right. That is the data from CONFUCY, including as I told you before, the output from NM Square because that is what you have to start with as input to CONFUCY.

And you asked me the question as to whether or not

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we were claiming the output as well as the program, and I told you yes. And I attempted to explain why we were doing that.

CHAIRMAN COWPAL: All right.

We will resolve that.

With regard to the Staff's answer to interrogatories which was filed --

We will take Mr. Renfrow's motion to reconsider under advisement and resolve it very promptly.

With regard to the Staff's supplemental answers as of February 7, 1977, we do find, Mr. Hoelling, that your response to the interrogatory is a little scant, particularly with regard to the first interrogatory, which is Interrogatory number 9; the basis for the findings in Table 1 is just; it is not there; it is gone.

You said that there was no reliance on documents. Well, there must be reliance on something to come up with a series of numbers. So we need information as to how, for example, a cost of some items will less than \$100,000 while the cost of some others will run between \$100,000 and \$1 million and so on.

And also, about how -- what thought process was involved in arriving at delay times.

Now I don't know what the responder relied on, but the response should contain that. If it is other people, it should say so or if it is some bunch of documents,

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it should say so. If you didn't rely on anything except what he would consider common sense, why the document should say so.

With regard to Interrogatory number 10, there are references to some documents. There are scattered, however, allegations of facts through here that there is nothing needed for supported.

Now I don't know what you finally relied upon, but I do think that the response is inadequate in that it either ought to say that it relied on information gained from Mr. X or Mr. Y or Mr. Z, or information that came from some series of documents, or that it was just a matter of relying on the affiant's judgment without any supporting factual data.

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MR. CHERRY: Mr. Chairman, my motion with respect to the Staff interrogatories went not only to the supplemental answers but to the original answers.

They did not provide documentary support on any of those, and I would appreciate the Board's ruling as asking the Staff to go back as to all the answers filed, whether original or supplemental, with the direction to state what documents they relied upon or people or, if none, to state expressly that there was nothing to support this except someone's judgment or something.

CHAIRMAN COUFAL: I'm not prepared to do that this morning, Mr. Cherry. I may very well do it, but I'm not prepared to do it this morning.

MR. CHERRY: But you are doing it with the interrogatory answers 9 and 10 and the supplement?

CHAIRMAN COUFAL: Yes.

MR. CHERRY: That's due now five days from today?

CHAIRMAN COUFAL: Yes.

Let me address this interrogatory matter a little bit. This whole discovery problem has been kind of pell-mell and hectic, trying to resolve problems while the hearing was in process, which, of course, under the time pressures we felt in getting this hearing underway was dictated to us, we thought, out of some necessity.

I'm not sure in retrospect it was a good way of

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handling things, but that's the way it was handled. It obviously doesn't provide any very good resolution of many of the problems.

It's obvious, particularly with regard to matters that Mr. Cherry has asked the Staff and Consumers for, that the hearing has continued while some of those matters were being considered. Of course, he was deprived of the benefit of those things.

I don't know any better now than I did three weeks ago how to resolve that without delaying the hearing, which we did not think was a very good idea.

Also, Mr. Cherry, you didn't file your interrogatories until the middle of January or later, and that could have been done in October or November.

MR. CHERRY: I filed them in December, sir.

CHAIRMAN COUFAL: Whatever.

MR. CHERRY: The time under the rules was one day before the hearing began.

CHAIRMAN COUFAL: Anyway, they were filed not long ago.

All right, you've got Mr. Feld here, Mr. Hoefling?

MR. RENFROW: Mr. Chairman, before we start with Mr. Feld, Mr. Cherry asked for some documents yesterday from Mr. Keeley. These are the Exhibit S-6 through S-6F that he had Mr. Keeley mark with the check marks.

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We've made copies of those for him and for the other parties and the Board.

(Documents distributed.)

MR. CHERRY: Mr. Chairman, I did not ask for this document. What I asked for was Mr. Keelley to give me the checks on the matters that were outstanding, that weren't resolved by the Staff and the ACRS, which compiled forty-three items.

I will now take this and make the kind of exhibit that I thought I was venerated.

CHAIRMAN COUFAL: Mr. Brenner?

MR. BRENNER: One other preliminary matter.

We're still waiting for some of the discovery requests from last week from Dr. Timm. We are under great time pressures with respect to all matters. We would inquire of Mr. Cherry whether he has it or not.

I did inquire off the record. He told me he'd like to respond on the record.

CHAIRMAN COUFAL: All right, Mr. Cherry.

MR. CHERRY: Mr. Chairman, I want to be clear when Mr. Brenner says, "We are awaiting some discovery matters," what we are awaiting.

We are awaiting a three-paragraph undated memorandum, which is in the mail -- I haven't received it yet -- that refers to a half-page of Dr. Timm's testimony. Mr. Brenner

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has everything else he asked for.

Number 2, there was a statement made by Dr. Timm that he was working on a draft report with respect to nuclear power plant capability generally. That only goes to one sentence in Dr. Timm's testimony, and Dr. Timm neglected to put that in. He's put it in the mail.

CHAIRMAN COUFAL: He has, you say, put it in the mail?

MR. CHERNY: I was informed yesterday that he did.

But I want to make it clear that the Regulatory Staff has received everything it's asked for. It never requested to talk to Dr. Timm, so I assume it doesn't want to. And the only thing it hasn't received is an undated memorandum which deals with a half-page of his testimony and a document which deals with one sentence of his testimony.

They've gotten everything else besides that, and they've had it for some time. In fact, if the Regulatory Staff had the temerity to ask Consumers Power what the basis of the testimony was, they'd have had this back in November, because all the documents we're giving them are only the ones we received from Consumers with the exceptions I've noted.

MR. BRUNNER: Mr. Chairman, there's simply no need to get into this kind of dialogue on a simple discovery request. I would like to briefly note that I've made no

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allegations that we were in an impossible situation or anything like that. I merely asked for some additional documents which we deem we need.

Regardless of how many sentences they support, they went very closely to the basis of some of Dr. Timm's subconclusions which have no express basis until we look at it.

I assure you we may need it for a reason once we look at it.

Number 2 is, with respect to Mr. Cherry's saying we've had many of these documents for a long time, I think the Board knows I got a stack of these documents yesterday. They're still being reproduced here in Chicago.

My witnesses, who I flew in at some expense to the taxpayers in order to be here based on the promise that we would have all of Dr. Timm's stuff last week, had to go home without all of Dr. Timm's stuff. That was my opportunity to get them all together. Now I've got to do that again next week when we go back to Washington.

So there are documents my experts don't have yet. With respect to all of the documents we could have had from Consumers, we did examine all of these documents. Dr. Timm's vague references did not make it easy to determine exactly which specific part of lengthy computer runs that we did have in our possession or have access to he was relying on.

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We asked those questions and got better identifications. We did not ask Mr. Cherry for those documents, if the Board will recall. We got those documents from other sources, so I don't see his statement going to anything at all that makes any sense in this context.

CHAIRMAN COUFAL: Well, the fact is I guess you've agreed there are only two documents that are at issue?

MR. BRENNER: There are only two documents that I as a lawyer was able to determine that we needed. When the people go through these documents, some of these documents are alleged calculations or bases for the numbers by Dr. Timm. When I can get them before my experts, they may look at them and say, "This doesn't make sense. It doesn't go to that calculation."

CHAIRMAN COUFAL: That's a problem we'll have to face when we get to it. But right now, as far as you know, there are only two documents at issue?

MR. BRENNER: With respect to what I've asked for so far.

CHAIRMAN COUFAL: Do you know when they were mailed, Mr. Cherry?

MR. CHERRY: I asked Dr. Timm to put them in the express mail yesterday.

CHAIRMAN COUFAL: All right. Then I suppose they'll be here tomorrow at the latest.

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MR. CHERRY: Maybe today.

CHAIRMAN COUFAL: Maybe today.

MR. BRENNER: If we have to leave town, or if the hearing concludes so that we can leave town before they're here, we're going to have a continuing problem. I hope Mr. Cherry is sympathetic with that and will help speed it to us when he gets it.

MR. CHERRY: All the Staff asked for was five clear days. Even if they don't get the document until Monday, which is highly unlikely, they will have more than five clear days.

CHAIRMAN COUFAL: Well, he has a point. If they go home and you put them in the mail here after they arrive, assuming they get here tomorrow, more than likely they won't get there for a long time.

Is there someplace here in Chicago that you can get together to pick those up, Mr. Brenner? Is there somebody that you have here? Is there some office here or something?

MR. CHERRY: They have a Glen Elyn office where they've put documents that I can reproduce. I assume they could send somebody from the Glen Elyn office to pick it up and send it via special courier from the helpful utility department. They've got a special courier.

MR. BRENNER: Well, we'll have the weekend and the days after that. We'll do whatever we can. But we'll be

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here through tomorrow morning at least, and I would appreciate a call from Mr. Cherry at the Midland Hotel, where we're staying, either myself or Mr. Headling, to advise us of whether or not the documents are in his office.

If they're not, we'll pursue trying to work something further out with him.

It presents a problem. We'd like to get it as soon as possible. That's my simple request, and I'm not pounding the table or anything in that regard.

CHAIRMAN COUFAL: Okay. Will you keep counsel advised, Mr. Cherry?

MR. CHERRY: I'll do everything I can to make sure that the requests that have been made of me are complied with on a prompt basis.

CHAIRMAN COUFAL: Okay.

Are you ready to go with Mr. Feld?

MR. REMFROW: Mr. Chairman, I don't want my silence to indicate that we may not also have the same problem. The documents were supposed to be entirely there on February 7th. We have our people also looking at them. We had them down here last week from Jackson, and we didn't get the documents.

We've talked to Dr. Timm. We at least have the first step out of the way. We may have to come back after we've reviewed the documents that we got yesterday. We are doing that and attempting to resolve it as soon as possible.



MR. CHERRY: Isn't that interesting? They asked for five days, and now they've gotten five weeks and they're telling you it may not be enough time.

The Falahes Principle is really working here.

MR. REMFROW: Mr. Chairman, look, I've sat here; I've been polite. I've asked for documents. I've listened to that stuff. I've had representations made that all the documents will be there, and they haven't been there.

I've said nothing so far except I may have problems with discovery.

Now, I'm getting tired of those remarks, when he's the man that made the promises that haven't been delivered on yet.

CHAIRMAN COUFAL: All right, let's --

MR. CHERRY: Injured innocence -- that's Step 2 of the Falahes Principle.

CHAIRMAN COUFAL: Mr. Cherry; both of you. Let's forget that kind of ad hominem nonsense and go on with trying to get a witness sworn.

MR. BRENNER: Mr. Chairman, I'd like to narrow one thing down.

Mr. Cherry made what I consider to be a somewhat ambiguous response, saying he'd do what he can. I would like the Board to direct him if it becomes necessary to call my hotel for Mr. Hoeffling tomorrow morning if we're not in

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session in the hearing here to inform us yes or no, whether the documents are there.

CHAIRMAN COUFAL: All right. Remind me at the end of the day, Mr. Brenner, of this impasse. The documents may very well be here.

MR. BRENNER: It's not a big deal. I think it's common courtesy. I regret the fact that I have to ask the Board to make it crystal clear.

DR. LEEDS: Mr. Renshaw, I think it would aid the Board -- and I'm not sure in what manner we would use them at this point, but it may be helpful to the Board in evaluating the effects of delay to see some numbers for comparison purposes.

Would you be so kind as to furnish copies of the annual reports and quarterly reports? I suspect the '77 one is not yet, is that true?

MR. RENSHAW: I think it's at the printer's.

DR. LEEDS: Okay. Would you give us the '76 one and send us a copy when the '77 one comes out?

CHAIRMAN COUFAL: Send us more than one. Send us enough to make a Board exhibit if we decide to do that.

MR. RENSHAW: The annual report for '76, the quarterly reports, and the '77 report when it's out?

DR. LEEDS: Right. And if there has been a prospectus issued for bonds or stocks or something like

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that last year, send us those, too, and any that come out along the way.

MR. CHERRY: Dr. Leeds, if I may suggest that the Board also ask for a copy of Mr. Raymond's speech before the New York Society of Security Analysts dated December 22nd, 1975, and the supporting documents for that speech.

I think you'll find it very illuminating.

DR. LEEDS: Well, I've made my request, Mr. Cherry. I don't know anything about the speech. I don't know anything about the documents.

MR. CHERRY: Well, I've got a copy.

DR. LEEDS: Do you want to make an exhibit of it?

MR. CHERRY: I only have one copy. I intended to somehow get it before the Board. In terms of up-to-date financial information, I just think the statements made by the Chairman of the Board to the New York Society of Analysts, which are public statements in the nature of a press release about how the company is doing, what this hearing is, et cetera, I think -- and I'll be glad to give the Board my copy to look at and see if it wants to ask Consumers for further information. I think you'll find some very interesting information in this public statement by Mr. Raymond about their financial position. That's all.

(Document handed to the Board.)

I've tendered the Board my copy of Mr. Raymond's

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CHAIRMAN COUFAL: Was that a P.R. handout of some kind from Consumers?

MR. CHERRY: It was an actual speech given.

CHAIRMAN COUFAL: I mean your copy. Was that something the Public Relations people gave or handed out?

MR. CHERRY: It was mailed to me by someone. I don't know whether it was a copy handed out at the speech or not, but it was printed up widely in the newspapers. It has some very incriminating remarks insofar as Consumers is concerned about their position in this hearing.

It also relegates the decisionmaking authority of this Board to some bureaucratic bumble bee that happens to be bothering Consumers. He doesn't think it will have any effect and so tells the Society of Analysts.

CHAIRMAN COUFAL: Well, he may be right.

MR. BENFROW: It may not be in here, either, Mr. Chairman. This is not a complete report.

If Mr. Cherry thinks it's important, we've had one of these in our documents for months and I would be glad to send you a complete copy of it.

MR. BRENNER: Mr. Chairman, this seems to be an extraprocedural diversion that has little place in here. I haven't seen the speech, either. I'd be glad to look at a copy if Mr. Cherry would like to lend me his outside of the hearing.

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If he wants to make some use of it formally in evidence before the Board, that's another point, also. But it seems like we're going nowhere with it at this moment.

CHAIRMAN COUFAL: Okay. Put on Mr. Feld, then, and we'll get going.

Is Mr. Meltz here?

MR. BRENNER: No, Mr. Chairman. Mr. Meltz is still ill.

What we're going to do is check with him over the lunch hour to find out whether he can be here tomorrow morning. If we can't get a definite yes as to that, we'll advise the Board.

It also depends somewhat on where we are with other procedures. We do keep talking to him and getting updates.

DR. LEEDS: Let the record show that the copy of that speech that Mr. Cherry handed us has been returned to Mr. Cherry.

The Staff asked for it. I assume that they can look at it.

MR. CHERRY: It's on the corner of the table. They may look at it.

CHAIRMAN COUFAL: Dr. Feld, would you please come forward? You haven't been sworn in this proceeding, have you?

DR. FELD: No.

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Whereupon,

DR. SIDNEY E. FELD

was called as a witness on behalf of the Regulatory Staff and, having been first duly sworn, was examined and testified as follows:

XXX

DIRECT EXAMINATION

BY MR. BRENNER:

Q Dr. Feld, for the record, will you state your name and position and business address?

A My name is Sidney Feld. I am a Regional-Environmental Economist with the U.S. Nuclear Regulatory Commission.

My business address is U. S. NRC, Washington, D. C. 20555.

Q Dr. Feld, I show you two documents. One is a 2-page document entitled "Professional Qualifications, Sidney E. Feld, U.S. Nuclear Regulatory Commission."

(Document handed to the witness.)

The second document consists of a cover page and thirty-five additional pages bearing the caption of this proceeding and entitled "NRC Staff Testimony of Sidney E. Feld on Need for Facility."

(Document handed to the witness.)

Were these documents prepared by you?

A Yes, they were.

Q Do you have any changes to these documents that

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you would like to make at this time?

A. Yes, I do.

Q. Would you make them, please?

A. With respect to my professional qualifications, I would just like to clarify one point.

At the very end of the first paragraph is a reference to testimony that was presented at several hearings. After consideration I realized that I don't believe the testimony on the Shearon Harris Nuclear Power Plant was actually presented. I did prepare testimony, but either the hearing was delayed and I left or for some reason it wasn't actually presented at the hearing.

Q. Are there any other changes to that document, Dr. Feld?

A. No, none.

Q. How about the other document identified by you entitled "Need for Facility"?

A. Yes.

On page 3 of that testimony, in the second paragraph, towards the end of the second paragraph, I've identified "more moderate weather" as one factor that may have contributed to decline in growth. I'd like to strike that statement to "more moderate weather."

I have seen that in my readings with respect to the Consumers Power Company, but since then I haven't been

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to relocate the source. For that reason I'd just like to strike it.

CHAIRMAN COUFAL: You're striking the three words "more moderate weather," which is in the last line of the second paragraph on page 3?

THE WITNESS: And, I guess, "and to some extent, more moderate weather . . . ," that would be stricken.

CHAIRMAN COUFAL: All right. So we strike "and to some extent, more moderate weather . . . ."

THE WITNESS: Right.

CHAIRMAN COUFAL: All right.

THE WITNESS: And on page 5, at the bottom, Item 2 identifies "the Luddington sale to Consolidated Edison." It should be Commonwealth Edison.

MR. CHERRY: What page is it?

THE WITNESS: On page 5, Item 2 under the Note.

BY MR. BRENNER:

Q Are there any other changes?

A One final correction would be on page 14, the titles of the two columns at the head of that are "Company Forecast (1976)," and it's MKWh. The more conventional way of presenting that would be GWh.

And the same thing on the second column, GWh instead of MKWh.

Q The GWh would stand for what, Dr. Feld?



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A Millions of kilowatt-hours or gigawatt-hours.

Q Does that complete your changes?

A Yes, it does.

Q As changed by you on the record just now, are these documents true and correct to the best of your knowledge and belief?

A Yes, they are.

Q And you adopt it as your testimony in this proceeding?

A Yes.

MR. BRENNER: Mr. Chairman, I move that the documents identified by Dr. Feld be admitted into evidence and bound into the transcript as if read.

MR. CHERRY: Is that just the need testimony or all of it?

MR. BRENNER: The identified testimony I'm moving in.

CHAIRMAN COUFAL: You're moving the receipt --

MR. BRENNER: Of the two documents that have been identified by Dr. Feld, that is, his professional qualifications and the document entitled "NRC Staff Testimony of Sidney E. Feld on Need for Facility," which consists of a cover page and thirty-five pages.

CHAIRMAN COUFAL: Is there an objection?

MR. CHERRY: Mr. Chairman, I object to the form of

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the testimony on need for power. although there is much in there that I would not object to if it were changed. But the testimony reads like a brief as opposed to testimony. It's argumentative in nature in the portions of the brief that I'm talking about. Let me give you an example of what I'm talking about as not appropriate testimony for a witness.

MR. BRENNER: I'm sorry. I didn't hear your last phrase.

CHAIRMAN COUFAL: I think he said "for a witness."

MR. CHERRY: For example, if you look at the discussion of conservation beginning on page 23 as an example, you will see that Mr. Feld's testimony is nothing more than a benign regurgitation of what he received from the Staff in telephone conversations, et cetera.

I would move the Board not to admit the testimony on the grounds that this witness has not done any independent analysis of the underlying data, but merely gives his views on the numbers and assumptions tendered by Consumers Power Company, since the Regulatory Staff is required to do an analysis that's independent of the utility it regulates or the procedure doesn't really make much sense.

Mr. Feld's testimony self-admittedly doesn't do that. He admits that, for example, on the top of page 11, where he says that the Regulatory Staff project team did not develop an independent forecast per se.

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I also, Mr. Chairman, have an additional memorandum which I intend to mark, dated October 5, 1976, reporting a telephone conversation from Mr. Heins to Mr. Feld, where Mr. Feld asked the REgulatory Staff to do calculations and give the results of the calculations to the Staff because they want to rely on those in the testimony.

CHAIRMAN COUFAL: You mean asked Mr. Heins to?

MR. CHERRY: Yes. And then Mr. Feld took those numbers and put them in.

As a matter of fact, the procedure got so ridiculous-- and I'll quote you now from Consumers document 110-032, to file from J. L. Heins, October 5, 1976, with respect to documents sent to the NRC. Maybe I ought to have this document marked Midland Intervenor's Exhibit No. 49.

(The document referred to was  
marked Midland Intervenor's  
Exhibit No. 49 for identification.)

CHAIRMAN COUFAL: Do you have any copies?

MR. CHERRY: I have one additional copy.

MR. BRENNER: Mr. Chairman, it appears we're getting a little far afield, if I understood the objection to the introduction.

MR. CHERRY: Mr. Chairman, I have one extra copy. I'll show mine to the rest of the parties. I'll give this to the Board. The handwriting on the second page is mine.

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The paragraph that I'm talking about, to give you a flavor of how this testimony was prepared, is paragraph 4, which says:

"Mr. Feld requested that the 1974 NPSG staff study on the evaluation of Consumers Power and Detroit Edison be reviewed by Mr. Heins and any changes in forecasting methodology be explained to him."

So instead of the Regulatory Staff independently reviewing this information and seeking out questions, as will become even more clear if you ask Mr. Feld a few questions on how he prepared this, the procedure by which this happened was, as we learned earlier, Mr. Renfrow was dispatched to take care of Mr. Brenner. We learned that from the exhibit that was produced by Dow.

After Mr. Brenner was well in hand, then they agreed to support the plant. Mr. Feld was selected; and, since Mr. Feld was given a predetermined conclusion to come up with testimony that supported the plant, he called Mr. Heins and got whatever information he needed.

CHAIRMAN COUFAL: Mr. Cherry, you're kind of editorializing here.

MR. BRENNER: Mr. Chairman --

CHAIRMAN COUFAL: Why don't you question the witness on voir dire and establish what you're seeking?

MR. RENFROW: I'm going to move to strike that whole thing.

CHAIRMAN COUFAL: It's stricken.

MR. BRENNER: I'm going to move to strike that, especially with respect to "take care of" and "well in hand" phrases used in connection with my name in this proceeding on the public record.

MR. CHERRY: Mr. Chairman, I don't want it stricken. I'm referring to a document.

CHAIRMAN COUFAL: When you get it in, Mr. Cherry, you can make whatever reference there is. If there are other documents that are in, you can argue from them.

MR. CHERRY: I appreciate that, sir, but I was just arguing in support of the motion, and you made a preliminary ruling that said I should seek ~~void~~ dire.

That doesn't mean that my argument gets stricken. That's unfair.

CHAIRMAN COUFAL: The parts of your argument I'm striking are the gratuitous remarks about the counsel in the case.

MR. CHERRY: Which counsel? Mr. Brenner?

I'm just quoting from a memorandum where Renfrow was dispatched to take care of Brenner.

MR. BRENNER: Mr. Chairman, as Mr. Cherry knows, that's not what the memorandum says. If Mr. Cherry would

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like to follow up on what he thinks the memorandum says in whatever proper form, I'll be happy to have him accommodated; but that's enough of this bandying about on the public record.

CHAIRMAN COUFAL: I agree with you. Let's just cut the personal byplay and get on with Mr. Feld.

MR. BRENNER: I would like to respond to the substance of what Mr. Cherry has said.

MR. CHERRY: I would like to do my voir dire. I guess you're not ruling on it until I do that. Is that correct, Mr. Chairman?

MR. BRENNER: I'd like to include the Board's ruling on voir dire in my comments.

CHAIRMAN COUFAL: What do you have to say?

MR. BRENNER: I don't believe what Mr. Cherry was talking about goes to the normal purpose of voir dire. His objection, as I understood it, started out as to the form of the testimony as supposedly argumentative.

He abandoned that line quickly and then went on to asserting that there was no basis and/or accusing the Staff of not doing their job, as I understand it, which is to investigate just what was done by a utility when they file things before us.

If he had read the testimony or remembered what he had read, he would be well aware of the content of those

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thirty-five pages and the many independent sources that were checked.

MR. CHERRY: Mr. Chairman, I move to strike the ad hominem remarks if we're going to be fair. Mr. Brenner doesn't have to tell me what I can remember, because what I forget he'll never learn in a whole lifetime.

CHAIRMAN COUFAL: Come on now, both of you, this is nonsense. We waste hours and hours every day.

MR. PENFROW: Mr. Chairman?

CHAIRMAN COUFAL: Mr. Penfrow, Mr. Cherry, both of you sit down and be still.

Mr. Brenner, you sit down.

MR. BRENNER: I'm not going to get into that type of thing. I'm going to state calmly the substance, I hope, Mr. Chairman.

CHAIRMAN COUFAL: Well, stay out of it.

Both of you keep quiet until Mr. Brenner finishes.

MR. BRENNER: I think these are subjects of proper cross-examination as to the content of the testimony and not the subject of counsel orally making his arguments and his findings at this time, so I don't think voir dire is appropriate. I think he's entitled to cross-examine the witness, and the witness is tendered for his cross-examination.

I was going to ask Dr. Feld at the time the testimony was admitted but the objection was interposed, to ask Dr. Feld

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to briefly summarize his testimony. I understand that the Board had viewed that as appropriate.

CHAIRMAN COUFAL: All right. Right now there's a pending objection to its receipt because of its form.

MR. BRENNER: Yes, sir. My response is that the objection does not go at all to receipt but merely to matters that he can cross-examine on and draw whatever conclusions he wants on his findings and/or further arguments and not through voir dire or objections to admission.

CHAIRMAN COUFAL: Well, Mr. Brenner, you've convinced me. We will receive the documents captioned "Professional Qualifications of Sidney E. Feld, U.S. Nuclear Regulatory Commission" to be bound into the record as though read, and the document which is captioned on its title page "NRC Staff Testimony of Sidney E. Feld on Need for Facility" will be bound into the record as though read.

(Documents follow.)



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

CONSUMERS POWER COMPANY

(Midland Plant, Units 1 & 2)

}  
Docket Nos. 50-329  
50-330  
}

NRC STAFF TESTIMONY OF SIDNEY E. FELD ON  
NEED FOR FACILITY

This testimony addresses the need on the part of the Michigan Electric Coordinated System (MECS) for Midland, Units 1 and 2, in the 1981-1982 timeframe. The analysis will show that, based on Consumers Power's (CP) and Detroit Edison's (DE) latest forecasts and capacity plans, the reserve margin in the summer of 1981, with Midland units delayed one year, will fall below that deemed necessary by the MECS to maintain reliable service. Furthermore, the staff will demonstrate that based on CP's latest projection of KWh sales, there exists an affirmative indication for the addition of baseload capacity on the CP system.

Underlying these analyses is our ability to accept CP's and DE's forecasts as reasonable measures of future growth and inherent in this acceptance is a recognition that conservation has been given adequate weight in these forecasts. Based on a review of the assumptions embedded in the utilities' forecasts, a review of independent forecasts and studies of the MECS service area, and consideration of the Federal Energy Administration's (FEA) regional forecast, the staff concludes that the utilities' forecasts are reasonable representations of likely future growth and they do, in fact, factor in the impact of conservation. The following testimony provides support for this conclusion.

#### CONSUMERS POWER & DETROIT EDISON SERVICE AREAS

Consumers Power is one of two major electric utilities servicing the State of Michigan. As of 1975, it provided electricity to a population of approximately 3.3 million people extending over a wide geographic area (lower Peninsula of Michigan except Southeastern portion) consisting mainly of rural areas and dispersed urbanized centers. Major cities within the service area include Grand Rapids, Flint, Kalamazoo, Lansing, and Battle Creek. The industrial demand for electricity is concentrated in the automobile industry with General Motors alone accounting for about one-third the Company's total industrial electric energy sales. Other important industries in the service area include primary metals, pharmaceuticals, machinery, oil refining, paper and paper products, and food products.

The second major electric utility in Michigan is the Detroit Edison Company. Their service area extends over approximately 7600 square miles in the more urbanized and industrial area of southeast Michigan. Its customers number about 1.6 million, and the population served is about 5 million.

The two utilities comprise the Michigan Electric Coordinated System and jointly service approximately 90% of Michigan's electrical needs.<sup>1</sup> They constitute a highly integrated system and in addition to joint planning efforts, they actively coordinate their transmission and generating equipment to meet the electrical needs of Michigan's lower peninsula. Because Consumers Power is an integral part of this larger system, the staff concludes that a determination of need for Midland must be viewed in the context of the combined capacity and combined demands of both Detroit Edison and Consumers Power.

#### Forecasting Demand

The staff recognizes the uncertain nature of forecasting and that there is no standard forecasting methodology to which one can turn as a reliable guide for predicting the future. Prior to 1973 few envisioned the oil embargo and the succession of bewildering events aggravated by the embargo: fuel shortages; double-digit inflation; a prolonged economic recession; sharp rises in the price of electricity and alternate energy sources; and the implementation of conservation programs throughout the country. Yet, in the uncertain environment of 1971, the applicant prepared a forecast and the staff evaluated those projections of KWh sales and peakload demand and deemed them reasonable. Today, it is abundantly clear that those forecasts overstated future growth for the period 1971 through 1975.

<sup>1</sup> Governor's Advisory Commission on Electric Power Alternatives, Final Report.. Facts and Recommendations, Vol. IV, Lansing, Michigan, August, 1976, p.4.

In 1971, when the applicant submitted its ER for the Midland units, it was forecasting a growth rate in peak demand of about 7.6% per annum for the years 1970 thru 1980. Their KWh sales forecast was also about 7.6% per year over the same time period. These forecasts were strongly influenced by the actual growth experience in the previous decade in which total sales for Consumers Power grew at 7.6% per annum (1961-70), with residential sales growing at 6.4%, Commercial sales at 9.1%, and Industrial sales at 7.8%. Similarly, Detroit Edison was likewise forecasting a relatively high growth rate back in 1971 based on its historic growth pattern.

But because of the factors identified above, growth in the 1970's did not keep pace with historical levels. Between 1970 and 1975, Consumers Power's KWh sales grew at a rate of about 4% and peak demand at only 3.9% per annum. In addition, actual declines in sales were registered in 1974 and 1975, and a decline in peak demand occurred in 1974. Clearly, factors such as conservation, an economic recession, higher prices for electricity, and to some extent, more moderate weather, all contributed to this decline in growth.

However, it should be noted that the preliminary results for 1976 suggest that growth is once again on the increase among the nation's electric utilities. For example, over the first seven months of 1976, the production of electricity by all U.S. utilities has been 6.7% above the same period last year.<sup>2</sup> Similarly, over the first eight months of 1976, KWh sales on the CP system are up about 7.4% and for DE, sales are up 7.9%.<sup>3</sup>

In the midst of declining growth in the MECS the two utilities have over the last few years continually revised their forecasts downward. For example,

<sup>2</sup>Energy Resources Council, President's Energy Program, Monthly Progress Report, August, 1976.

<sup>3</sup>East Central Area Reliability Council (ECAR) - 1975-76 KWh Consumption by Ultimate Customer.

CP's latest forecasted growth rate is approximately 35% below that forecasted in 1972. The forecasts under consideration today, at this hearing, are CP's 1976 forecast of sales and peak demand of 4.9% per annum between 1975 and 1984, and DE's 1976 forecast of 4.8% growth in sales and 5.2% growth in peak demand between 1974 and 1984. It is the staff's belief that these moderate growth rates do in fact take conservation as well as other inhibiting factors on growth into account and reasonably reflect the likely growth over the time period under examination.

Clearly, adjustments to MECS's capacity plans were necessary to reflect the recent experience and these lower growth projections. In the last few years, the response to capacity planning has been rather dramatic. For example, in 1974, Consumers Power announced the deferral of 2773 MWe and the cancellation of 2300 MWe. Detroit Edison deferred 5779 MWe and cancelled 1150 MWe. Thus, the total amount of capacity either deferred or cancelled was 12,002 MWe, at a time when the two companies' total installed generating capacity was approximately 14,000 MWe. In addition, the Midland units themselves are now rescheduled to come on line about 4 years later (1981-82) than initially planned back in 1971 (1977-78).

#### Need for Additional Capacity

Table 1 presents the utilities latest summer peak demand forecasts and capacity plans for the years 1981 thru 1983. The table identifies two cases: Midland units on-line as scheduled (available for summer of '81 and '82); and Midland units delayed one year (available for summer of '82 and '83). In the event Midland is not delayed, the reserve margin (net capability as a percentage of peak demand) is projected to be approximately 20% over all three years, however with a one year delay, the reserve falls to 14.2 and 18.1 percent in 1981 and 1982 respectively. It should be noted that based on the applicant's reliability analysis a reserve margin of about 20% is needed on the MECS to maintain a reliability criterion of one day in ten years loss of load which is a recognized standard throughout the electric utility industry.

Michigan Electric Coordinated System (C.P. and D.E.)  
 TABLE 1 Summer Peak, Capacity and Reserve Margins  
 1981 thru 1983

Y E A R	Peak Demand <sup>a</sup> (MWe)	Net Capability (MWe) <sup>b</sup>		Reserve Margin as % of peak demand	
		Midland on-line as scheduled	Midland delayed one year	Midland on-line as scheduled	Midland delayed one-year
1981	15127	18084	17273	19.5	14.2
1982	15891	19220	18760	20.9	18.1
1983	16653	19896	19896	19.5	19.5

<sup>a</sup>SOURCE: Consumers Power Company Environmental Report Supplement, October 26, 1976, Table 1.1-1.

<sup>b</sup>SOURCE: Consumers Power Company Environmental Report Supplement, October 26, 1976, Tables 1.1-6 and 1.1-7.

Note: Staff accepted the data presented in these tables with the following exceptions:

- 1 - we assume Palisades will not be out during the 1981-82 period.
- 2 - the only sales of capacity that the staff has taken account of are the Luddington sale to Consolidated Edison of 624 MWe and the sale of 220 MWe of Fermi 2 to municipalities. Although other sales are projected by the Applicant and may well materialize, no deduction from capacity has been made for them.
- 3 - The staff has taken account of a 147 MWe derating of capacity for (CP) and 143 MWe for (DE) during summer peak load due to higher cooling medium temperatures in summer. See ER Supplement, p. 1.1-20.

### Need for Baseload Capacity

The staff also evaluated the need for baseload capacity on the CP system. Essentially, this consisted of a quantitative comparison of projected baseload demand and baseload capacity for the years 1981 thru 1983. All units designed and operating as baseload units were identified by the applicant. For example, in 1981, with Midland 2 in service, the CP system will have 7682 MWe of capacity of which 4698 MWe will be baseload for a percentage share of total capacity of about 61%. Without Midland 2 on-line, the baseload portion would approximate 57%. As of September 30, 1976, CP's baseload portion approximated 59% which suggests that the addition of Midland 2 would not alter significantly CP's historic relative dependence on baseload capacity.

Baseload demand has been estimated by the staff as a function of forecasted KWh sales. It may be noted that nationally approximately 85 to 90% of the KWh's generated during the year are at loads equal to or less than the average load. For CP the staff has estimated that 88.2% of its KWh sales occur over this range of their load duration curve.<sup>4</sup> The staff assumes that these KWh's will be generated by those units in the system that are the most economical to operate, usually the large units. The remainder of the electrical energy will be generated by peaking or cycling units. Taking 1981, the year the first unit is expected to go on-line, the applicant forecasts an energy level of 29,835,000 MWh. 87.5% (midrange between 85 and 90) of this is about 26,106,000 MWh. At a capacity factor of 65% for baseload units, this would require 4585 MWe in baseload capacity.

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<sup>4</sup>That load equal to or less than the average load for the CP system is a function of its load duration curve which can be approximated by a fifth degree polynomial whose coefficients are closely related to just two quantities--the ratio of the minimum load to the maximum load during the period, and the ratio of the average load to the maximum load. The preceding method is discussed in International Atomic Energy Agency, "Market Survey for Nuclear Power in Developing Countries," September, 1973, and comments to that article, Nuclear Technology, "Letters to the Editor," letter by Artha Jean Snyder, Vol. 24, November, 1974, p. 260. These ratios were calculated for the CP system based on 1975 results as reported in CP's FPC Annual Report, Form No. 12, Schedules 12 and 13. The results indicate that 88.2% of the total KWh's generated occur at loads at least equal to the average load.

Table 2 presents the baseload capacity and demand estimates for CP for the years 1981 thru 1983. Based on this analysis, a delay of one year will result in shortages in baseload capacity of about 700 MWe and 125 MWe in 1981 and 1982 respectively. With Midland on-line as scheduled, surpluses of between 84 and 335 MWe will occur in the 1981 to 1983 period.

Y E A R	BASELOAD CAPACITY		BASELOAD DEMAND	BASELOAD MARGIN-EXCESS OR (DEFICIT)	
	With Midland on line as scheduled	With Midland delayed 1 year		With Midland on line as scheduled	With Midland delayed 1 year
1981	4698	3887	4585	113	(698)
1982	5158	4698	4823	335	(125)
1983	5158	5158	5074	84	84



A third factor which is relatively important in considering the applicant's need to add the proposed nuclear plant to its system is the desirability of adding non-fossil capacity to reduce fuel consumed by gas- and oil-fired units now forming about 27% of CP's total system capacity. To the extent that this substitution can occur, it will increase the availability of these more versatile fuel resources for other uses for which there is no available substitute. Shifts of this nature are consistent with national energy objectives as set forth by the Federal Energy Administration and the Federal Power Commission, and are also beneficial in reducing our nation's balance of payment deficit.

The foregoing analyses suggest that the Midland units are needed as scheduled to maintain reliable service for the MECS customers, to meet the need for baseload capacity on the CP system, and to permit CP to limit its dependence on scarce fossil fuels in accordance with national energy policy. However, for the most part, these analyses are dependent on two important assumptions:

- 1) that the capacity estimates in the 1981-83 time frame will materialize; and
- 2) that the growth forecasts envisioned by CP and DE will likewise materialize and are reasonable in light of the potential for conservation savings.

#### System Capability - 1981-83

Capacity planning on the CP and DE systems has undergone dramatic revisions in the last few years in response to changing demand and financial conditions. The capacity data appearing in Tables 1 and 2 represent the latest plans (as of mid-1976) available to the staff. The staff believes that the estimates used herein are conservative because the potential for future delays and deferrals in capacity are ignored even though they are very much a reality whereas the addition of capacity not planned for at this time is highly unlikely because of the large lead time typically required.

For example, the capacity plan presented here assumes that six units, excluding Midland 1 and 2, with a total net summer capacity of 4459 MWe will come on-line between 1977 and 1983 as scheduled. Given the frequency with which construction has been delayed in recent years, this must be characterized as a very optimistic assumption. Furthermore, it does not take into account the possible repairs to Palisades which represent a potential derating of CP's capacity of approximately 680 MWe during the 1981-82 period. Also, it assumes that gas and oil supplies will be adequate to allow CP to meet the future demands that will be placed on its gas- and oil-fired capacity. Out of a total capacity of 7682 MWe in 1981, oil- and gas-fired units will account for about 1800 and 400 MWe's respectively. And finally, it does not reflect CP's present plans to sell portions of Midland 1 and 2, and Campbell 3 which, if consumated, would further reduce CP's net system capability in 1981 and 1982.

#### Independent Assessment of Demand

The staff has had an opportunity to review two independent forecasting analyses that project growth in electricity demand on the MECS. Since they are solely concerned with growth in the CP and DE service areas and because they are the products of analyses performed under the auspices of the government of the state of Michigan, their inclusion here appears warranted. In addition, the staff has also considered the FEA's latest forecast for the east north central region. Although this forecast is not as precise geographically (evaluates growth in a five state region), it is included here as a secondary reference check on the preceding analyses. Each of the analyses will be discussed and their results will be compared with those made by CP and DE.

MICHIGAN PUBLIC SERVICE COMMISSION

In December of 1974 the Michigan Public Service Commission (MPSC) released a report entitled Evaluation of the Consumers Power and Detroit Edison 1974 Load Growth Forecasts. The document prepared by a project team within the MPSC, responded to a request by the Commissioner to:

Provide an independent evaluation of the electric demand load factors and forecasts for the Commission's use in evaluating electric demand requirements.<sup>5</sup>

The thrust of the report is a detailed evaluation of the 1974 forecasts prepared by CP and DE. After a careful analysis of each of the assumptions underlying growth in the residential, commercial, and industrial sectors, as well as a detailed investigation of the impact of conservation, substitution, growth in the economy, and the future behavior of the load factor, the report concludes that:

- 1) The forecasting methodologies used by both CP and DE seemed reasonable and were consistent with generally accepted approaches used by utilities across the country. Furthermore, they were depicted as containing a high degree of analysis and statistical support although specific areas of improvement were identified;<sup>6</sup> and
- 2) In the opinion of the PSC project team, the CP and DE 1974 forecasts underestimated future peak demand. This conclusion was based primarily on the project team's belief that the utilities overstated conservation savings and understated growth in the Michigan economy.<sup>7</sup>

<sup>5</sup>Michigan Public Service Commission, Evaluation of the Consumers Power and Detroit Edison 1979 Load Growth Forecasts, Staff Study 1974-4, December, 1974, p. 1-9.

<sup>6</sup>Ibid., p. 2-1<sup>a</sup>, 2-2 and 3-7.

<sup>7</sup>Ibid., p. 2-1, 2-11.

Although the project team did not develop an independent forecast per se, they did produce a reforecast range by substituting alternative assumptions within the Companies' forecast methodologies. It should be emphasized that this is not to say that the Companies' forecasts are necessarily incorrect, or that the project team's are correct. Rather, they indicate the general direction in which the project team believes the actual values may be relative to the Company estimates.

The key parameters used in CP's and DE's 1974 forecast methodologies are depicted in Tables 3 and 4 respectively. For each parameter, three estimates are presented. The first is the company's own estimate which was used to generate their 1974 forecasted growth rate in electricity demand. The latter two values represent the high and low values that the project team assigned to the same parameters based on their research and knowledge. These estimates were then incorporated into the forecasting model to derive high and low estimates of electrical growth in the CP and DE systems. It is interesting to note, that in several instances, CP's value for a particular parameter was even less than the MPSC's low value for the same parameter. For example, whereas in 1974 the applicant assumed an average use per residential domestic customer of 7800 KWh by 1982 and a rate of growth in GNP of 2.3%, the MPSC's low estimates were 8100 KWh's and 3% respectively. The project team's estimates for electrical growth for the year 1982 appear in Table 5. Represented are projected KWh sales and peak demand for CP, DE, and for the MECS (CP and DE combined). In each instance, high and low values are depicted. These estimates are contrasted with the Companies' latest (1976) forecasted results.

Table 5 suggests that CP's forecasts are consistently conservative, even when contrasted to the MPSC's low forecast. For DE, the Company's forecasts are consistently below the high-end of the project team, however, are apparently not as conservative as the project team's low forecast with respect to peak demand. Here, the Company's own forecast is about 700 MWe greater than the project team's low value. With respect to the MECS, the

TABLE 3  
 MPSC SUPPORTING ASSUMPTIONS FOR REFORECAST  
 Based on Projections by 1982  
 Consumers Power

FORECAST CATEGORY	1974 FORECAST	MPSC HIGH ESTIMATE	MPSC LOW ESTIMATE
- Residential Sales			
. Number of Customers	1,275,500	1,304,600	1,265,000
. Marginal Space Heating Saturations	40%	50%	70%
. Average Use Per Residential Domestic Customer	7,800 KWH	8,700 KWH	8,100KWH
. Average Use Per Space Heating Customer	19,200 KWH	19,900 KWH	18,900KWH
-Commercial Sales	6.05%	7.37%	5.17%
-Industrial Sales			
Sales to GM	1%	2.2%	1.5%
. Sales to Other Industrial			
.. Rate of Growth in GNP	2.3%	4.0%	3.0%
.. Rate of Growth in Usage Per Unit FRB	0%	1.9%	1.1%
-Load Factors			
. Space Heating Load Factor	45%	45%	45%
. Net System Load Factor	65%	63%	67%

SOURCE: Chart 4.26 C, MPSC Study.

TABLE 4  
MPSC SUPPORTING ASSUMPTIONS FOR REFORECAST RANGE  
Detroit Edison

FORECAST CATEGORY	1974 FORECAST	MPSC HIGH ESTIMATE	MPSC LOW ESTIMATE
<b>Residential Maximum Demand</b>			
.Number of Customers	1,759,000	1,759,000	1,700,000
<b>Air Conditioning Saturations</b>			
..Room	46%	50%	42%
..Central	23%	25%	21%
.Marginal Space Heating Saturations	63.5%	80%	80%
<b>Average Use Per Customer Temperature Sensitive Load</b>			
..Room Air Conditioning	500	600	400
..Central Air Conditioning	3,200	3,200	2,800
..Electric Space Heating	14,000	14,000	12,000
.Average Use Per Customer Non-Temperature Sensitive Load	6,804	7,600	6,600
.Residential Load Factor	54.4%	50%	50%
<b>Commercial Maximum Demand</b>			
.Commercial Growth Rate	4.6%	5.0%	4.2%
..Commercial Load Factor	46.6%	44%	47%
<b>Industrial Maximum Demand</b>			
.Rate of Growth in GNP	3.5%	4.0%	3.0%
..Industrial Load Factor	77.5%	72.5%	77.5%

SOURCE: Chart 4.15 C, MPSC Study

Table 5 - 1982 KWh Sales and Peak Demand for CP, DE, and MECS--  
Companies' Forecasts vs. MPSC Range

1982 KWh SALES

	Company Forecast (1976) MKWh	MPSC RANGE MKWh	
		HIGH	LOW
Consumers Power	31386 <sup>a</sup>	38737 <sup>b</sup>	34494 <sup>b</sup>
Detroit Edison	48423 <sup>c</sup>	57443 <sup>d</sup>	49937 <sup>d</sup>
MECS (CP & DE)	79809	96180	84431

1982 PEAK DEMAND

	Company Forecast (1976) MWe	MPSC RANGE MWe	
		HIGH	LOW
Consumers Power	5840 <sup>a</sup>	6734 <sup>b</sup>	6354 <sup>b</sup>
Detroit Edison	10051 <sup>c</sup>	11222 <sup>d</sup>	9337 <sup>d</sup>
MECS (CP & DE)	15891	17956	15691

a - Consumers Power Company Environmental Report Supplement, October 26, 1976, Tables 1.1-1 and 1.1-3

b - MPSC Study, Chart 4.26B, p. 4-79

c - Latest forecast submitted 10/18/76 by CP on behalf of DE - Note, since DE only forecasts total output, 1982 sales were estimated by applying growth rate in total output (1975-82) to actual sales in 1975.  
1975 sales = 32,419 MKWh and 1975-82 growth = 1.49

d - MPSC Study, Chart 4.15B, p. 4-42

Companies' combined peak demand is approximately 2000 MWe below the commission's high forecast and about 200 MWe above their low forecast. On balance, one must conclude that relative to the MPSC forecast range, the Companies' combined 1976 forecasts are a conservative reflection of likely electric growth in its region.

Governor's Advisory Commission on Electric Power Alternatives (GACEPA)

In August, 1976 the GACEPA released a study which, among other things, provided the state with an econometric model to forecast electricity demand in the CP and DE systems.<sup>8</sup> The model utilized quarterly data over a ten year period (1965-74) with the exception of the industrial sectors which were developed on 19 years of annual data. Using this data base and regression analysis it derived estimating coefficients for key explanatory variables. The model was fairly disaggregated in that it forecasted sales by major customer class (residential, commercial, and industrial) and within the industrial sector attempted to forecast by the Department of Commerce's Standard Industrial Classification Code (SIC). This attempt at further disaggregation was statistically effective with respect to the CP forecasting model but produced excessively downward biased forecasts for the DE model.<sup>9</sup> Consequently, the forecast for the DE industrial class was ultimately performed on an aggregated basis.

Once the causal variables and estimating coefficients were defined, the Advisory Commission Staff postulated future levels for all causal variables. Three distinct scenarios for the growth levels of causal variables were developed.<sup>10</sup>

<sup>8</sup>Governor's Advisory Commission on Electric Power Alternatives, Final Report...Facts and Recommendations, (Vol IV) Lansing, Michigan, August 1976.

<sup>9</sup>Governor's Advisory Commission on Electric Power Alternatives, Forecasting Electric Energy Demand in Michigan, Vol II, Lansing, Michigan, February, 1976, p. 29.

<sup>10</sup>Advisory Commissions Final Report, pp. 14-15.



However, one study suggests that even with important technological breakthroughs, government subsidies, and large conservation investment, the more dramatic forecasted conservation savings may not be realized. The FEA has projected annual kWh growth through 1985 under a conservation scenario which includes: thermal efficiency standards for new buildings, appliance standards and labeling, an insulation tax credit, an industrial energy conservation program, and increased dispersed solar equipment. The program has been characterized as an aggressive one, with the commitment of \$250 billion over a ten year period in conservation investments in all energy markets. The difference in the results generated through this scenario vs. the FEA reference case is a reduction in the growth rate of electric utility output of 0.5 percent per year over the period 1974-85. Thus, given government incentives, and the expenditures of high sums of money for technological developments, growth in kWh sales is not eliminated, but simply lowered by one-half a percentage point a year, which results in a fall-off in sales of about 9 percent relative to the FEA reference case.

In the opinion of the staff, the foregoing discussion provides support for the applicant's position that conservation is adequately accounted for in its present forecast. And in the event savings should exceed present estimates, the staff feels that countervailing forces exist which may offset an increased conservation response.

### SUBSTITUTION

Since the new emphasis on energy conservation has resulted principally from the energy crisis, it is equally important to inquire as to what extent will the future substitution of electrical energy for fuels in short supply -- namely, oil and natural gas -- tend to increase the demand for electrical power and thus offset the impacts of conservation measures.

Recognition of this positive stimulus to future electrical demand has been frequently noted in the literature. Preliminary data already indicate shifts by consumer groups due to price and supply considerations associated with natural gas. For example, for the residential sector, for the first six months of 1973, the sale of gas ranges was down 0.6 percent from the year before while electric ranges were up 12.6 percent over the same time period. Water heater sales suggest a similar trend; gas water heater sales up 1.2 percent versus electric water heater sales up 18.4 percent. For gas and electric dryers, sales of electric models increased 17.5 percent versus an increase of 5.5 percent for gas units. And in the spaceheating category, gas fired units were down 9.3 percent versus a 15 percent increase for electric models. In 1974, the Electric Energy Association predicted that for the first time more than half the newly built homes in the United States would be heated electrically.<sup>29</sup>

Recently, the 50th American Assembly held a symposium attended by 62 experts from government, industry, and the academic community where the following general consensus was reached:

For U.S. electric power demand, it was felt that although growth would probably be less than the historic growth rate, it was unlikely to be less than 5 to 5.5 percent in view of the need to substitute electrical energy for some present uses of oil and gas.<sup>30</sup>

<sup>29</sup> See for example, "Energy Crisis Alters Power-Use Pattern," Electric World, January 1, 1974 and Sanford Jacobs, "More Homes are Using Electric Heat," Wall Street Journal, February 18, 1974.

<sup>30</sup> The American Assembly, Columbia University, Report of the Fiftieth American Assembly, April 22-25, 1976, Arden House, Harriman, New York.

### Natural Gas - National Perspective

As early as 1969, it was recognized by the Federal Power Commission's (FPC) Bureau of Natural Gas that the nation would be facing difficulties of supply emerging during the period 1969-73.<sup>31</sup> The shortage indeed appeared such that by 1971-72 the major pipeline companies and distributors in most parts of the country were forced to refuse requests for additional gas service from large industrial customers and many new customers. By 1970, ninety-five percent of the proven reserve inventory was already committed to gas sales contracts and was therefore unavailable for sales to new customers or for increased volumes to old customers. Availability had decreased to such an extent that it became necessary for the FPC to curtail service on interstate pipelines and to issue guidelines and priorities in meeting commitments to gas customers.<sup>32</sup>

### Natural Gas - State of Michigan

In 1970, gas requirements in the state of Michigan were approaching one trillion CF. Today, because of curtailments on the major interstate pipelines servicing Michigan, the available supply approximates 900 billion CF or a short-fall from 1970 requirements of about 10 percent. As a result of this shortage most Michigan gas distributors have not hooked up new commercial and industrial customers since 1970. Today, only one distributor continues to service new non-residential customers but does so on a selective basis. Thus, the 10 percent short-fall in supply may be misleading because it does not take into account most of the growth in gas requirements that would have occurred in the commercial and industrial sectors between 1970 and 1976.

In recent years, the applicant has observed some minor conversions to electricity on the part of CP customers.<sup>33</sup> For example, in the industrial sector during the last 6 to 8 years conversions to electric furnaces have

<sup>31</sup> Federal Power Commission, "National Gas Supply and Demand 1971-1990," Staff Report No. 2, Bureau of Natural Gas, Washington, D.C., February 1972.

<sup>32</sup> 38 F.R. 1503 (January 15, 22, 1973).

<sup>33</sup> Consumer Power Company, Environmental Report Supplement, October 26, 1976, pp. 1.1-14 & 15.

resulted in the addition of about 200 MWe. Recently, a natural gas pipeline company replaced gas engines with electric motors resulting in a small electric load of about 2200 KWe. In addition, CP has received numerous inquiries from industry, including one from one of its largest customers, to discuss contingency plans calling for conversions to electricity. New commercial and industrial buildings and private residences are also installing electric heat with much greater frequency. For example, since 1970, the number of homes heated with electricity has more than doubled (18.6 thousand vs. 39.4 thousand) on the CP system.

The results to date indicate that although electricity is increasing its market share relative to other energy sources, the transition is slow in coming. The Governor's Advisory Commission on Electric Power Alternatives acknowledges that the substitution stimulus in Michigan is really not effective at the present time and attributes this to the fact that increases in the price of natural gas have not yet matched those of other fuels. However, they conclude that shifts out of natural gas should pick up momentum in the next decade and ultimately predominate over those factors such as conservation which tend to reduce growth in electricity demand.<sup>34</sup>

Specifically, they identify the following substitution factors as items that will increase the future demand for electricity in Michigan.<sup>35</sup>

- . Natural gas, historically the space-heating fuel of choice, will become, less available and/or much more expensive in real dollars. As natural gas becomes less available and/or more expensive, space-heating installations will turn to oil and electricity.
- . New and more efficient forms of electric heating and cooling, such as the heat pump, are being developed and put into widespread commercial and residential use. As such developments make electric heating and cooling more

<sup>34</sup> Governor's Advisory Commission on Electric Power Alternatives, Final Report--Facts and Recommendations, State of Michigan, Lansing, Michigan, August, 1976, pp. 19-22.

<sup>35</sup> Ibid., pp. 19-20.

desirable, they will increase its use in new and, to some extent, replacement applications.

- . The low capital cost of electric resistance heating makes it attractive to builders of both single-family and multiple dwellings. (Over 50% of dwelling units completed in recent years contain electric heating.)
- . Uncertainty of future price and availability of natural gas and petroleum-based fuels has led to increased experimentation and commercial development of devices which run on electric power.

Another study<sup>36</sup> also acknowledges the importance of substitution on future electric demand and identifies these shifts as being long-term in nature. The authors of this study conducted a survey of the major energy consuming manufacturing industries in the United States to determine the effect of potential short-falls of fossil fuels on future industrial electric energy requirements.

The 15 most energy intensive manufacturing groups were selected, representing over 90 percent of the energy consumed by the industrial sector in the United States. Ten companies from each of these groups were selected for interviews and in all, 142 companies and approximately 25 trade associations, electrical equipment manufacturers, and electric utility industry representatives were contacted.

Of the 142 companies surveyed, 80 percent indicated that they expect a short-fall of certain types of fossil energy and 61 percent plan significant changes in their energy mix during the next ten years and have developed contingency plans. Of those companies expecting to make energy use changes in the immediate future, most anticipate greater reliance on oil, apparently due to the ease of conversion. However, although

<sup>36</sup>Potential Fuels Shift--A Survey of Contingency Planning by Manufacturing Industries in the United States, A Report by Stone & Webster Manufacturing Consultants, Inc., for the Edison Electric Institute, May, 1976.

oil will remain the dominant alternate fuel for the two to five year immediate period, increased shifts to electricity and to new coal applications are anticipated. This study concluded that...."over the long term, the number of companies using coal and electricity is expected to increase significantly.<sup>37</sup>

Industrial activity in the state of Michigan is concentrated in the lower peninsula where CP's and DE's service areas are located. According to the Census of Manufactures, the 1972 manufacturing activity in those counties serviced by MECS accounted for over 95 percent of total manufacturing payrolls and value added. Furthermore, those manufacturing activities that predominate in Michigan also happen to be the most energy intensive. For example, the 15 most energy intensive industries, as identified in the preceding survey, account for over 95 percent of Michigan's manufactures value added.

The staff has attempted to calculate the potential level of conversions and translate this to its effect on the growth in electricity in the MECS's service area. The FPC's Bureau of Natural Gas has adopted a policy which includes reallocation of available natural gas away from low priority use together with conversions to alternate fuels for all interstate gas supplies. Industrial use, of which manufacturing is a subset, has been designated a low priority by the FPC. Approximately 90 percent of the natural gas consumed in Michigan enters the interstate supply system and thus comes under the authority of the FPC. Just viewing manufacturing activity, one can demonstrate that electricity growth, via natural gas substitution, can be significantly expanded.

<sup>37</sup> Ibid., p.4.

In 1971, Michigan manufacturers purchased fossil fuels for heating and power purposes equivalent to 149.3 billion kWhs of electricity. In the same year, these industries' direct use of electricity amounted to about 25.4 billion kWhs. Thus, approximately 14.5 percent of their energy needs were being met with electricity. This is slightly higher than the national average in 1971 of about 13.4.<sup>38</sup>

However, Michigan's dependence on fossil fuels is heavily biased toward that which is in shortest supply -- namely, natural gas.

Seventy, point two billion kWh equivalent, or 47 percent of the energy used by Michigan manufacturers was produced with natural gas.<sup>39</sup> Thus, independent of economic growth in the state, there nevertheless does exist a vast potential source of increased demand by manufacturers in the MECS. This potential is somewhat on the order of three times the electricity demand by manufacturers in the state. For each billion cubic feet of natural gas replaced by electricity, the MECS would realize an increase in electricity sales of about .3 billion kWhs or an increase in their annual electric sales growth rate of about 0.5 percent (using 1975 as base). That is, if growth in 1976 is presently projected at 5 percent, with an additional one billion CF of conversions, it would be 5.5 percent. And one billion CF of natural gas represents only 0.4 percent of what manufacturers in Michigan used in 1971. Adding potential conversions from other fossil fuels and other customer groups would of course add further to the potential growth in electricity from substitution.

<sup>38</sup> Derived from--U.S. Department of Commerce, Bureau of Census, 1972 Census of Manufacturers Fuels and Electric Energy Consumed, (Washington D.C.: Government Printing Office, July, 1973), Tables 1 and 4.

<sup>39</sup> Ibid., Table 4

In summary, the staff believes that the existing shortage of natural gas in the state of Michigan and the uncertainty of future supply offers significant growth potential in new electric loads in the MECS service area over the forecast period and beyond. However, it must be emphasized that just as with conservation savings, there is no guarantee that substitution's full potential will be realized. Rather, its inclusion here appears warranted to simply identify a potential off-setting influence to conservation.



PROFESSIONAL QUALIFICATIONS  
SIDNEY E. FELD  
U. S. NUCLEAR REGULATORY COMMISSION

I am Sidney Feld, Regional-Environmental Economist with the Cost-Benefit Analysis Branch, Division of Site Safety and Environmental Analysis of the Regulatory Staff of the Commission. I served with the Staff from July 1973 to August 1974, and rejoined the Staff in October 1975. I am responsible for reviewing and analyzing Applicants' environmental reports and preparing cost-benefit sections for the NRC Staff's Environmental Statements. During the 1973-74 period, I conducted generic research on topics related to the social and economic impacts of nuclear power plants, including costs of delay, and the potential for population and industrial growth in the vicinity of nuclear plants. More recently, I have been involved in preparing a staff guide for use in instructing staff reviewers on the requisite methodology in analyzing the issue of need for facility. I also presented testimony on need for power and conservation of energy issues for the hearings on Alvin W. Vogtle Nuclear Power Plant, April 1974, the Shearon Harris Nuclear Power Plant, May 1974, and the Wolf Creek Generating Station, February 1976.

I received a B.B.A. Degree in Economics from the City College of New York in 1967, an M.A. Degree in Economics from the University of Rhode Island in 1969, and a Ph.D. Degree in Resource Economics from the same university in 1973. My graduate degree in resource economics focused on the application of economic theory to public resources. Areas of study included: simulation of market economic solutions; consideration of social implications such as environmental impacts; and the application of decision tools such as cost-benefit analysis.

From September 1974 through August 1975, I was an Assistant Professor of Resource Economics at the University of New Hampshire at Durham, New Hampshire. In this capacity, I taught courses in Resource Economics and Statistics. I also served as co-investigator on a Sea Grant research project to examine economic activity in the New Hampshire Coastal Zone.

During fiscal year 1970, I served as the coordinator of the Governor of Rhode Island's Technical Committee on the Coastal Zone. In this capacity, I prepared working papers and parts of the Committee's Final Report. The Committee's recommendations were adopted by the State Legislature in 1971, leading to the establishment of a Coastal Zone Council and Coastal Zone Laboratory, both of which are presently the state's principal governmental bodies overseeing coastal resources.

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CHAIRMAN COUFAL: I think Mr. Brenner was right, that those kinds of questions that you have, Mr. Cherry, are more appropriate for cross-examination than voir dire.

MR. CHERRY: Very well.

MR. BRENNER: With the admission into evidence, Mr. Chairman, the Staff would appreciate an opportunity for Dr. Feld to summarize his testimony for the benefit of people present and for the members of the press present if the Board deems that appropriate.

MR. CHERRY: I would object, Mr. Chairman. There's no need to have time taken out when I'm donating my time to have Mr. Feld summarize for the benefit of the press.

Insofar as the people who are present, they include my secretary and someone who works for Bechtel, so I don't really think that that's really appropriate here.

CHAIRMAN COUFAL: Okay, your objection, Mr. Cherry, is overruled.

Go ahead, Mr. Feld. Give us a brief summary of what your testimony is about.

THE WITNESS: In this testimony I have analyzed the need for the electric power and the electric energy that is to be generated by the Midland Nuclear Power Plant, and I have looked at this need for the 1981-1993 time period.

I have evaluated these needs based on two criteria. The first criteria is to determine whether or not the Midland

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Nuclear Power Plant is needed in order to provide reliable service and reliability as based on a reserve margin above peak demand in the 1981-83 period.

The second criterion -- well, let me just go back to the first one specifically. I think there is a very important point to be made here with respect to this reliability analysis.

In this testimony we have defined this service area, that is, the one that is relevant for reliability, as being the Michigan Electric Coordinating System. The service area encompasses both Consumers Power and Detroit Edison, and the reason why we have looked at reliability in this context is because these two utilities jointly plan, coordinate and build generating and transmitting equipment. They dispatch power as a single entity. Finally, when the Staff initially assessed the need for the Midland Plant with the initial FES back in 1972, that was the service area that was deemed to be appropriate.

Furthermore, when the Michigan Public Service Commission and the Governor's Advisory Commission on Electric Power Alternatives look at reliability, they do so in terms of the combined system.

The second analysis that we did was to look at the need for the Midland Nuclear Plant in terms of providing base load generating capacity in the 1981-83 time period.

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I think just to look at the bottom-line conclusions of the first analysis one could turn to page 5 of my testimony. On page 5 Table 1 appears, which identifies peak demand, net capability under two varying assumptions, and the resultant reserve margins.

The peak demand numbers that appear here are the 1976 forecast, the latest forecast, of Detroit Edison and Consumers Power, and I would say that the bulk of the remaining part of this testimony addresses the reason why the Staff is able to accept this forecast as reasonable measures for those years.

Specifically, the Staff had available to it several independent forecasts that were prepared for Detroit Edison and Consumers Power service areas for the Michigan Electric Coordinated System. Those were the Michigan Public Service Commission study and the Governor's Advisory Commission study on Electric Power Alternative. One of those was an econometric approach; one was a more subjective analysis, which essentially reviewed the assumptions and methodologies employed by the utilities.

In each instance those forecasts substantiated the forecast that was made by Detroit Edison and Consumers Power in 1976.

We also used as a secondary check the FEA regional forecast on electricity growth, and by deriving estimates for

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the service area based on the regional forecast I again concluded that the forecasts of the utilities were reasonable and in line with the FEA analysis.

The second category is net capability, and I feel that in this particular instance the Staff has been quite conservative in arriving at the estimates of net capability in the 1981-83 time period.

I think it important to identify certain assumptions that are embedded in these estimates, because they have been continually mentioned over the course of this hearing.

The Staff has not given any credit to net capability for the Palisades Nuclear Power Plant --- I'm sorry, by that I mean the Staff -- this analysis assumes the net capability will include 686 megawatts of Palisades as if it was on line. It assumes that the Campbell-3 sale that is being proposed to municipalities and co-ops and the sale of Midland will not take place.

Each of these factors tend to increase net capability, and, therefore, raise the reserve margins that result.

I think I should point out that there's one assumption in the net capability estimate that is not conservative relative to what the Consumers Power did, and that is we gave Consumers Power and Detroit Edison a summer derating based on the deratings that occur on certain units on a system because of the high temperatures during the summer. And that is explained in the footnote.

The final reserve margins are essentially calculated

based on the net capability and peak demand figures, and they show that with Midland on line as scheduled reserves can approximate 20 percent. With Midland delayed one year, the reserves fall to less than 20 percent.

With respect to the second criterion -- and I think the result of that can be seen on page 7 -- the Staff has estimated baseload capacity with Midland on line, or with Midland delayed. It has estimated baseload demand, and it has shown that with Midland delayed there will be slight deficits in baseload capacity on the Consumers Power system.

I think that pretty much summarizes it.

CHAIRMAN COUFAL: All right, go ahead Mr. Brenner. Do you have anything further, Mr. Brenner?

MR. BRENNER: I have one clarifying question on direct that has come up in this hearing before, which may interest the Board.

BY MR. BRENNER:

Q Dr. Feld, are you familiar with a proposed sale of 20 percent of the power from Fermi-2 generating unit which has been discussed before in this proceeding?

A Yes.

Q When were you first aware of this? Were you aware of this prior to the preparation of your testimony?

A Yes, I was. There was a Wall Street Journal article that --



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MR. CHERRY: Objection, and unless his familiarity is described I may very well object to no foundation.

CHAIRMAN COWAN: I think that's what he's about to do, was describe it.

MR. CHERRY: Well, then let's have that question asked. He's about to tell us he read a Wall Street Journal article. I think, sir, - -

MR. BRENNER: I'll tie it up, Mr. Chairman.

MR. CHERRY: Just a minute, Mr. Brenner. The merits of the answer should not be gone into until the foundation questions are asked.

CHAIRMAN COWAN: Go ahead and tie it up, if you can, Mr. Brenner.

BY MR. BRENNER:

Q Dr. Feld, what was the source of your information with respect to the identified possibility of sale of that 20 percent prior to the time of preparation of your written testimony?

A In May of 1976 the Wall Street Journal reported that letters of intent had been signed between itself and these municipalities and co-ops interested in 220 megawatts. As I understand it, more recently -- a later article states that that agreement has now moved closer to being finalized and final contracts are being signed.

Q On the basis of that identified 20 percent sale

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of Fermi-2, would you have to make any changes to your testimony to reflect that?

A. No, I would not. That is already reflected in the net capability figures.

MR. CHERRY: Mr. Chairman, I would move to strike everything after Mr. Feld's statement, "The Wall Street Journal." He was asked the question: What is the basis for your statement, and he said the Wall Street Journal and then proceeded to move forward to tell what it is.

I do not believe that this witness should be able to offer for the truth of the matter stated complicated questions concerning letters of intent, et cetera, from a reading of the Wall Street Journal.

Friday Mr. Crocker made judgments based on Nucleonics Weekly. Now Mr. Feld makes judgments based on the Wall Street Journal. That is just not the way to regulate nuclear power.

MR. BRENNER: Mr. Chairman, the point of this is for purposes of the record before the Board. We've got no problem, because it is identified in the direct testimony. I merely wanted to highlight it because the Board had highlighted it previously, and I think this is common practice, to assist your search of the record later, and in fact our search of the record later.

If I could remind the Board, the context was there

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were questions with respect to whether or not Consumers Power forecast had included the possibility of these sales, and then further possible theories flowing from the fact that they may not have already included these sales in their capability. And if they hadn't included these sales, would sales of other units occur, and so on.

I think it useful and very material to the record to note that Dr. Feld took account of the reports of these sales which the public literature has now identified as about to be consummated in a contract.

CHAIRMAN COUFAL: Well, isn't the important part, Mr. Brenner, what assumption he made when he made his projections?

MR. BRENNER: That's correct, Mr. Chairman, and that's exactly what I wanted to highlight. It does appear in a footnote in his testimony. At the time the testimony was prepared, there were many facts which are not necessarily of highlightable value in terms of the Board's interest or the general interest. But after the preparation and filing of the testimony, this one fact did get highlighted in the proceeding and I think it's an obligation of counsel to direct attention as to where it's highlighted.

You did ask the Staff at one point, I believe -- and I'm sorry I wasn't present that day but it was reported to me that the Board had expressed some interest in knowing how

the Staff would factor this in.

CHAIRMAN COUFAL: All right. That's enough, Mr. Brenner. Let the testimony stand. The important issue is what assumption he made in his testimony, and not, I guess, whether he read the Wall Street Journal or what.

Have you got anything more, Mr. Brenner?

MR. BRENNER: No, Mr. Chairman, Dr. Feld is available for cross-examination.

CHAIRMAN COUFAL: All right. Mr. Remrow?

MR. REMROW: I have no questions on this portion of Dr. Feld's testimony, Mr. Chairman.

CHAIRMAN COUFAL: Bow?

MR. NUTE: No questions.

CHAIRMAN COUFAL: Mr. Cherry?

MR. CHERRY: Do we have all of Mr. Feld's testimony in?

CHAIRMAN COUFAL: Well, I'm not going to, as with the Licensee, as far as --

MR. CHERRY: Well, I'll defer my cross until all of Mr. Feld's testimony is in, unless he's not going to put anything else in, then I won't fool with it.

MR. BRENNER: May I be heard, Mr. Chairman?

CHAIRMAN COUFAL: Yes, sir.

MR. BRENNER: I think the proponent of the direct case has the option as to how that case will be put in,

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provided there's no great prejudice shown in the segmentation.

This is an area that is easily separable from the cost-benefit area and Dr. Feld's other testimony. Dr. Feld should not have to sift through many, many pages of testimony and many, many documents in focusing his attention on cross.

Cross-examination which purposefully wanders over all documents would only tend to obfuscate the record. Mr. Cherry should be required to ask all his questions now as related to the scope of this direct testimony.

I might add, I think it would make the Board's job much easier with respect to objections as to scope of the testimony and things of that nature. Also, Dr. Feld has two other pieces of testimony. Originally we had proposed to put one of those pieces in jointly with Mr. Melts. If the schedule proceeds such that Dr. Feld's cross-examination on used for power is completed today, and Mr. Melts won't be here, I will then continue with Dr. Feld with the other two pieces of testimony.

CHAIRMAN COUFAL: What's the second piece? Cost of replacement power, and what else?

MR. BRENNER: It's the fuel cost differential on cost of replacement power as related to delay cost. It's important to point that out.

And then the other piece is the economic comparison of the coal alternative with the proposed nuclear

plant. Although different, those two areas do have some overlap and I would certainly be willing to put those two places in together.

136 CHAIRMAN COWLEY: Okay, Mr. Cherry, cross-examine on this one.

MR. CHERRY: Mr. Chairman, I was served by the Regulatory Staff with all of their testimony, and I have prepared by questions on the basis of all of the testimony being in, and I cannot proceed now on the basis of limiting my questions merely to one portion of the testimony.

I don't see any basis at all for the Regulatory Staff's position. They're only talking about putting in one piece of the papers involved. I'm entitled to cross-examine on all of the testimony tendered, and it is impossible for me to move forward on the basis of my preparation, when I relied on all of the testimony. I cannot do it.

MR. BRENNER: Mr. Chairman, Mr. Cherry makes that kind of a statement in what I believe is an attempt to put the Board in an awkward position. I don't think the Board should feel itself to be in an awkward position. He presents no basis for his statement that it's impossible to cross-examine.

The areas are clearly different. One is need for power. The other is the economic comparison. It's that simple.

I also did point out that although there were separable areas in the other two pieces of testimony, I will certainly admit that there is some overlap, and I would put those two pieces in together.

But it is just beyond any possible rationale for Mr. Cherry to point to any specific prejudice with respect to putting this testimony in. In fact, it is not unusual to have separate witnesses for the Staff for these pieces of testimony.

MR. CHERRY: Mr. Chairman, I'll make one other point:

That cost of coal alternatives to to the question of purchased power, because he's using coal prices which go to the question of purchased power, which is an integral part of the need-for-power testimony, because he's talking about availability of fossil purchased power.

Secondly, replacement power resulting from suspension deals directly with his assertions of what's available in 1981-83.

All of the testimony is of an integral part, and it relates to testimony, and the Staff has not shown any prejudice in proceeding forward this way.

This is an administrative hearing. They don't have a right to put in this testimony. This has been available for four months. No one has ever told me I would have to

proceed on this basis, and I cannot do it. I have prepared carefully detailed cross-examination on narrow areas which interrelate, and I don't see any prejudice to the Staff. And I'm telling you, there's prejudice to me.

Now, I'll quit. I have no questions for Dr. Feld, if I cannot ask him questions as related to all of the testimony which I have studied and worked on with Dr. Timm for four months.

MR. BRENNER: Mr. Chairman, this "I'm walking out" stuff just doesn't --

MR. CHERRY: I'm not walking out.

MR. BRENNER: -- just doesn't deserve any comment. There is great prejudice to the Staff. The witness has different testimony in different areas that cover a wide spectrum, and there's going to be ranging areas of cross-examination even if we put them in separately. It's going to be impossible for the witness to focus his attention on the areas. There's just too many documents, too many numbers, too much detail.

This isn't a two-page flip piece of testimony. This is an extensive piece of testimony with extensive numbers and calculations, and extensive bases which will have to be gotten at in cross.

Mr. Cherry's statement as to how the testimony is interrelated is simply wrong. The replacement power and



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the cost of the coal and nuclear plant do interrelate somewhat, and I'll say again, for the third time, I would put those two pieces in together.

The need-for-power testimony does not relate at all to the assumed costs. Once one finds a need for power that could be keyed in the next area to the replacement power. But if you read the replacement power testimony in order to be conservative we assume only for that purpose no need for power, just to have a conservative lower replacement power cost.

There was very little of a tenuous tie in the first place, because it's a serial tie rather than an inter-relationship tie. Secondly, because of the way we did it, we even removed that tenuous tie.

(The Board conferring.)

CHAIRMAN COUFAL: Okay. Mr. Cherry, it's the feeling of the Board that you should proceed on NRE testimony of Sidney B. Feld on Need for Facility.

MR. CHERRY: I've explained my reasons why I cannot, Mr. Chairman.

CHAIRMAN COUFAL: All right. Then you're electing not to?

MR. CHERRY: No, I'm not. I'm being forced not to.

CHAIRMAN COUFAL: All right, whatever.

MR. CHERRY: Will the Board permit me to -- well,

let me try it another way:

May I have two exhibits, please, marked for identification? I'd like to mark the testimony of Sidney B. Fold on the Cost of Midland V. Cell Alternatives, as Midland Intervenor's Exhibit 50, and NRC Staff testimony of Sidney B. Fold on Cost of Replacement Power Resulting from Suspension as Midland Intervenor's Exhibit 51.

MR. BRENNER: Does the Board grant the request to mark those?

CHAIRMAN COYNE: Do you have some objection to marking them, Mr. Brenner?

MR. BRENNER: Yes, Mr. Chairman. It's clear that we're just getting into a legal wrangle which prevents the Board from going into the factual inquiry which this Board deserves.

CHAIRMAN COYNE: Now, I've been trying to get a witness going here since 9:30 this morning, and all I've heard is legal wrangle by everybody, most of which was not of overwhelming significance or interest.

Now, he's got a right to mark exhibits, Mr. Brenner, and I suppose to do whatever he thinks he ought to do with them.

So ahead, Mr. Cherry.

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## CROSS-EXAMINATION

BY MR. CHERRY:

Q Mr. Feld, can you identify Exhibits 50 and 51, which have been marked?

MR. BRENNER: Mr. Chairman, I would like to --

CHAIRMAN COUFAL: Just hold still a minute, Mr. Brenner.

THE WITNESS: Yes.

BY MR. CHERRY:

Q Is that testimony prepared by you?

A Yes.

Q That was all filed on the same date?

A To the best of my knowledge, yes.

Q And it was prepared by you in the same time frame as a project in connection with your overall testimony in this proceeding?

MR. BRENNER: I'm having difficulty hearing you, Mr. Cherry.

BY MR. CHERRY:

Q I said: The testimony on need for power which has been received, plus Exhibits 50 and 51, were all prepared by you as part of your presentation in this proceeding?

A Yes.

Q Could you be provided with copies of 50 and 51 by

your counsel? I want to ask you some questions about them.

CHAIRMAN COUFAL: No, you're not.

MR. CHERRY: Pardon me?

CHAIRMAN COUFAL: This is counsel's prerogative, how he wants to run his case, Mr. Cherry, and whatever the witness thinks about what he wants to testify to and when does not bear on the rulings at this point.

MR. CHERRY: So that I can't --

CHAIRMAN COUFAL: Make an offer of proof, if you want to, whatever you want to prove by this witness, if permitted to ask the questions.

MR. CHERRY: Well, I don't want to waste time. You're saying I can't ask questions about Exhibits 50 and 51 that I've identified?

CHAIRMAN COUFAL: I'm saying, for the purpose of determining the question as to whether or not you're cross-examining on the need for power, you may not. You may make an offer of proof why you want to do that. You can ask, obviously, when that testimony gets in, if it ever gets in, you can ask all the questions you can think of about it.

MR. CHERRY: Well, Mr. Chairman, I'll withdraw Exhibits 50 and 51.

I've made a rather open and candid statement to the Board about my financial problems. I'm determined to stay through the cross-examination of Regulatory Staff. I've

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prepared by cross-examination to go to the three documents, and I just don't see that I'm getting sufficient courtesy from the Board in connection with my cross-examination. Whether two pieces of paper are in the record or three is immaterial to the Regulatory Staff's case.

If on cross-examination an interrelationship exists that indicates this witness can't handle the matter, that's the appropriate time to raise it.

DR. LEEBS: Mr. Cherry, let me say this: I'm not sure I understand why it's necessary. I could see how perhaps as you went along through the need for power that there might come up some sort of tie some way, which I don't know what your questions are, but conceivably there could be a tie there that would come as the questions develop. But it would seem like that you could start with the need for power part, and if later on it turned out there was a meaningful tie, we could reevaluate the situation in light of the specific question asked and the specific facts that are trying to be presented.

And it seems to me that -- maybe I'm wrong, maybe you could explain it to me, why you can't proceed with respect to the need for power issue, and then if something came up later on to tie these documents in some way -- I don't know how it would be, because I don't know what your questions are -- but if you could then present that as a

specific point rather than a generalized statement -- that's what my problem is, it's a generalized statement of the need to do these three together.

MR. GIBNEY: Dr. Leads, I'll move forward as best I can in light of the Board's ruling. I have made whatever statements I can. I think that I'm entitled to shape my cross-examination in a manner that's calculated to bring out information. And the only additional thing I'd like to say, and then I'll move forward, is that all of my cross-examination was planned with a very careful strategy in mind.

In connection with Consumers Power Company, my strategy involved the fact that I wanted to isolate their witnesses.

In connection with Dow Chemical, my strategy involved that I wanted Dow Chemical to get on the stand because I thought they would tell the truth.

My strategy in connection with the Regulatory Staff is my business, and I am entitled to create a strategy of cross-examination which I feel is most calculated to bring out the truth.

The only way that I can do that, in my judgment, in a way that's consistent with the preparation that I have made, is in accordance with the suggestion I've made.

I don't want to go any further, but I do regard the Board's ruling as an intrusion on my ability to strategize

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my cross-examination however I see fit.

BY MR. CHENRY:

Q Dr. Feld, I want to show you what's been marked as Intervenor's Exhibit Number 40, and ask you if you remember a conversation with Mr. Holms at or about October 5, 1976, dealing with the subject matters that are set forth in Midland Intervenor's Exhibit 40?

MR. LENTROW: Mr. Chairman, may I just see the document? I haven't even seen it yet. It was marked before we had a chance to see it.

CHAIRMAN COUFAL: I guess there's only two copies in the room.

MR. BRENNER: I can look over the witness' shoulder at the exhibit, with the Board's permission.

CHAIRMAN COUFAL: Go ahead.

(Pause.)

MR. BRENNER: Mr. Chairman, I'd like to state that I read it, and depending on how detailed the questions flow from it, it may be difficult not having a copy in front of me, which is why it's better to have copies of exhibits.

CHAIRMAN COUFAL: Take care.

DR. LEEBS: I'll loan you mine as soon as I've had a chance to read it myself. I haven't had that opportunity.

MR. BRENNER: Perhaps I could be permitted to just jump up and continue to look at the copy the witness has.

DR. LEEDS: I'll be glad to give you this copy just as soon as I have a chance to read it.

MR. CHERRY: Mr. Chairman, this was a packet of documents which was sent by the Regulatory Staff that included this memorandum. The Regulatory Staff has had this memorandum for some time.

MR. BRENNER: I never meant to imply anything different. What Mr. Cherry says is absolutely correct. I just don't have a copy in front of me. Dr. Feld might have his own copy somewhere in his bags, but rather than have him go through it all --

CHAIRMAN COUFAL: All right.

MR. BRENNER: I will affirm that we did in fact provide Mr. Cherry with those.

BY MR. CHERRY:

Q Mr. Feld, can you confirm that on or about that date you discussed with Mr. Heins the subject matters in that memorandum which is marked as Highland Intervenor's Exhibit 40?

CHAIRMAN COUFAL: Mr. Feld, before you answer that, wait until Dr. Leeds gives Mr. Brenner his copy, or our copy.

(Document handed to Mr. Brenner.)

THE WITNESS: Yes.

MR. CHERRY: Dr. Feld, could you speak up? I'm having a good deal of difficulty hearing you.



BY MR. CHERRY:

Q Now, Dr. Feld, there is a reference on page 3 of that memorandum to a 35 percent reserve that the Regulatory Staff had calculated?

A Yes.

Q Did you make a calculation which would show certain assumptions for that 35 percent reserve for Consumers Power's service area in the period 1981-84?

A Yes, I believe I did. But I would like to explain something here.

I was asked to examine need for power back in October, and at that point in time the Applicant had not even submitted its ER supplement. And, therefore, I was working with very limited information.

I would say that probably my first estimate of reserve margins, based on limited information, showed -- and looking just at Consumers Power -- perhaps showed this, this 35 percent reserve margin.

Q Didn't Consumers Power provide the Regulatory Staff with information like the information in the environmental report supplement in other documents that were available to you, Mr. Feld?

A Well, I think there's something to be said here, in that the series of events were slightly in reverse in this particular instance. I was asked to look at need for power

before an environmental report was submitted. I made requests for data and information from the Applicant, and I received that information from the Applicant.

And then when the environmental report came out, I believe that the Applicant felt that if this was the type of data that the NRC needs to evaluate need for power, then they would present it and expand upon it in their environmental report.

So I think the similarity that you see between the types of information that I requested or I needed, and what was in the environmental report, reflects the fact that the environmental report was catered to my needs.

Q I'm talking about whether or not the Palisades generating station had submitted information on need for power of Consumers' system, which was in your possession at the time you made the 35 percent calculation. Or didn't you look at the Palisades --

A My recollection is that the Palisades ER would be much, much too outdated.

Q Are you aware that there's a draft environmental impact statement of recent date that deals with a suggestion to go from 686 to 786 megawatts electrical on Palisades' system and analyzed need for power for Consumers entire system, and that the Staff has prepared a draft environmental impact statement on that?

MR. RENFROW: Mr. Chairman, my continuing legal objection to the line of questions as to Palisades. I'll just have a continuing objection.

CHAIRMAN COUFAL: All right. Overruled.

BY MR. CHERRY:

Q Dr. Feld?

A I did not review the Palisades latest statement. I wasn't aware of its existence at the time I prepared my analysis.

Q Are you aware of its existence now?

A Yes.

Q What changes would be made in your calculations if an additional 100 megawatts were available from Palisades?

MR. RENFROW: Object to that question. There is no basis in the record, Mr. Chairman, that there will be an additional 100 megawatts.

CHAIRMAN COUFAL: He said "if" there is. That's an assumption.

MR. BRENNER: Mr. Chairman, I have a slightly different objection, and I think the assumption is too vague for the witness to answer, unless a year is defined, as to when the 100 megawatts assumption that Mr. Cherry asked the witness to make would be on line.

MR. CHERRY: Beginning in 1981.

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MR. RENFROW: Yes, sir.

CHAIRMAN COTLER: Okay, go ahead with Dr. Feld.

CROSS-EXAMINATION (Continued)

BY MR. CHERBY:

Q Dr. Feld, before the noon hour I attempted to ask a question, which I'll rephrase again:

Will you agree with me that Consumers Power Company has no need-for-power problem based upon your testimony and the assumptions made therein during the 1951-53 period, if you limit the discussion to the Consumers Power Company's service area?

A I thought I responded to that question before.

I would say if you limit your analysis to the Consumers Power service area, your reserves would increase relatively dramatically, let's say in the 30 percent range; 30, maybe 33 percent as the maximum.

At the same time, if you limit yourself to the Consumers Power analysis -- just to Consumers Power -- you should then be concerned about a reserve margin requirement that corresponds to just Consumers Power. That would be something on the order of 50-55 percent.

Q So it's your testimony, I take it, that if you make the assumptions that you have made in your testimony, which is a given in my question, Dr. Feld, and then you limit the analysis to Consumers Power, however with the

assumptions you made in your testimony, that there is still a need for power in 1981-83 in Consumers Power's area?

A I guess I'm having difficulty with the question, because my testimony does not address just the Consumers Power --

Q Yes. Well, if we turn to page 6 of your testimony, and the table contained therein, with the reserve margins that you gave me as corrected, limiting it to Consumers Power in the Midland Valley case, of 23.6 percent in 1981, 31.5 percent in 1982, and 32.6 percent in 1983, would you agree with me that those figures do not suggest a problem in Consumers' area?

MR. BRENNER: Mr. Chairman, I'm going to object. This question has been asked and answered. But the problem is Mr. Cherry keeps limiting it to one of the parameters. The answer, three times now, has shown that you can't limit it to that parameter.

CHAIRMAN COUFAL: Yes, we understand. Go ahead, Dr. Felt.

BY MR. CHERRY:

Q Do you understand the question, Doctor?

A I believe I do, and I would agree with you, if you just looked at Consumers Power, the reserve margins would be what you just stated.

Q And those numbers would be adequate for Consumers

service system, based upon all of the assumptions you made in your testimony if you assume no other assumptions are changed, would you agree with that?

A No, I do not.

Q Now, Dr. Fald, when I asked you what the reserve margins would be if you limit to Consumers' territory, on page 5 of your table 1, you gave me the figures I've just mentioned, correct?

A Yes.

Q What calculations did you go through in order to arrive at those reserve margins?

A I took the peak demand forecasts for Consumers Power in the 81-83 period. I calculated the net capability under Consumers Power's system in 1981 through '83 based on my assumptions regarding the capacity on Consumers Power's system that I previously specified as pertaining to sales and Palisades, and so forth. And I calculated reserve margins on that basis.

Q What other assumptions did you change in your testimony in making those calculations?

A I did not present this type of analysis in my testimony, so --

Q I'm just asking you, what you arrived at those figures, did you change any of the assumptions in your testimony, other than limiting it to just Consumers' territory?

A Again, I didn't prepare these numbers. They don't appear in my testimony.

Q I know, but they appear now in your cross-examination, and I'm asking you: When you calculated these numbers, I told you what would change -- I asked you to tell me what would change on table 1, if you just limited the analysis to Consumers Power's service area, but took all the other assumptions in your testimony as corrected, and then you gave me those numbers? Correct?

A Correct.

Q Okay. Would you agree with me, then, if you leave all the assumptions in your testimony alone, the ones you have already made, that there exists, based upon the calculations you have made, a sufficient reserve margin for Consumers Power without Midland in 1981-82?

A I'm having difficulty being that, because the reliability that I'm addressing is for the Michigan Electric Coordinating System.

Q Dr. Feld, I don't know that I agree that you're having difficulty with the question. I think you don't want to answer it. But --

MR. BARNER: Mr. Chairman, I'm going to object and ask that he continue. I had an objection to that same question as having been asked and answered three times. It's now been asked and answered four times.

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I think the difficulty is clear on the record. I appreciate that the Board let it continue for the sake of seeing where we're going, but it's clear that we're just going in the same circle.

The witness has attempted to answer and explain what his difficulty is. Since it's the same answer for the fourth time, he didn't go through the same litany.

But I think it's clear to the Board and everybody else what's happening.

MR. CHERRY: There's a motion to strike pending, sir.

CHAIRMAN COUFAL: It was an objection to the question.

MR. CHERRY: No, it was a motion to strike.

MR. BRENNER: It was a motion to strike Mr. Cherry's comment that the witness doesn't want to answer the question, or words to that effect. There was also an objection to allowing the continuation along the same asked-and-answered line.

CHAIRMAN COUFAL: Overruled.

BY MR. CHERRY:

Q Now, Dr. Wald, you made certain assumptions in your testimony, all right?

A Yes.

Q Now, do you believe any of those assumptions in



connection with your analysis are wrong?

A No, I do not.

Q Do you believe that any of the assumptions you made in your testimony are wrong if you were to limit the analysis just to Consumers Power's service area?

A Yes.

Q Which ones?

A I have to find a reserve margin that is necessary to maintain one day in ten years as 30 percent for the Michigan Electric Coordinating System. If I wanted to just analyze the reliability on the Consumers Power system, I would expect that the reserve margin would be considerably higher.

Q Did you read Mr. Keins' testimony?

A Yes.

Q Mr. Keins says Consumers was capable of purchasing between 30 and 40 percent of their needs for reserve margin, is that correct?

A Yes.

Q Now, assuming that Mr. Keins was correct in that statement that he is capable of buying between 30 and 40 percent of Consumers reserve needs, assuming the correctness of that statement -- do you follow me so far, Dr. Feld?

A Yes, I do.

Q -- would you then agree with me that if we limit the analysis to Consumers Power's service area, Consumers has

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a sufficient reserve, i.e., above 20 percent, during the period 1981-84, without Midland?

A I would agree with you, but I would have to emphasize that I have looked at the reliability -- the reserve margins on Detroit Edison's system in 1981-83, and if they were to provide 30 to 40 percent of their peak demand in those years they would not even be able to supply their own load.

Q You've talked to Detroit Edison people about that?

A I have looked -- I have not talked to Detroit Edison, but I have pursued other avenues.

Q Yes. Where did you get the information you looked at?

A I requested from Consumers Power the forecast for Detroit Edison, their forecasting methodology. I reviewed the same in the Michigan Public Service Commission's study and the Governor's Advisory Commission study. I also reviewed their filings with ECAR which are then forwarded to the Federal Power Commission under an order, and I also looked at the Fermi ER filing that Detroit Edison made to the Nuclear Regulatory Commission.

Q But in all of those filings that you looked at and documents, all you got were conclusions. You did not get the raw data with which one could check whether the conclusions were correct; is that correct?

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A I don't think that's fair. Certainly with respect to the Fermi BR there is a breakdown on the capability by units, identifying what assumptions they have in their net capability figures. The forecast is explained in there, as well as in the Michigan Public Service Commission filing.

Q What year of the Detroit Edison forecast did you look at? In other words, when was Detroit Edison's forecast made that you looked at?

A 1976.

Q What date?

A I believe May, I'm not certain.

Q May of 1976.

And you accepted that Detroit Edison forecast as correct, based upon what you've stated?

A Yes.

Q Now, did it ever dawn on you, in light of the fact that Mr. Heins had made this statement of 30 to 40 percent availability, to ask him what the justification was for that?

A I think --

Q I'm asking whether or not --

A Yes, it did.

Q Did you?

A Yes. The lawyers directed questions to Mr. Heins while he was on the stand, addressing that particular point.

Q Did you ever call Mr. Heins and ask him, in

connection with the preparation of your testimony, whether or not you could rely upon the 30 to 40 percent figure?

A No, I did not know that he was thinking in that magnitude, based on my -- it didn't come out until this hearing.

Q Well, but you knew before you got on the stand today?

A Yes.

Q Have you ever asked Mr. Heins that question after you'd seen his testimony?

A No.

Q Now, you agree that that's a very important question to ask, because you have agreed with me that if Mr. Heins is correct in this statement then Consumers has sufficient reserve margins without Midland from 1981 to '83, isn't that correct?

A Yes.

Q Now, is it your understanding that Mr. Heins has withdrawn this statement, that Consumers can buy during 1981-83 30 to 40 percent of its reserve requirement?

A No, it's not, but I think I would like to say something on that, because --

Q Well, just a minute, Dr. Feld. We've gone through this again, and --

MR. BRENNER: Mr. Chairman, I think the witness

is entitled to explain answers. He is clearly doing his best to be unresponsive. It's clear that this isn't the type of witness who is making speeches. He asked to explain his answer. This is a complicated, technical field.

CHAIRMAN COUFAL: I think he can explain it. Go ahead.

BY MR. CHERRY:

Q Are you making an explanation?

A It's an explanation of the question. I am not certain, but it is my feeling that what Mr. Nelson did was look at the winter peak on the Consumers Power system, and Consumers Power is in a very unique position because they are forecasting their maximum load will be the same in the winter as in the summer.

And the reason why I think he's looking at the winter peak is that they didn't give themselves any credit for the summer demand, although they identified that in their DR supplements.

If you assume he's looking at his winter peak, Detroit Edison is a summer peaking system, and, therefore, there exists a certain amount of diversity between the two companies. And it is conceivable that Detroit Edison could make a contribution to placement of power's availability for the winter peak.

But the summer peak is what is identified as the

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peak for the Michigan Electric Coordinating System, and the summer peak is just as high for Consumers Power as the winter peak.

So I don't think Detroit Edison is going to be able to help them out during that critical period of peak demand.

Q Have you discussed your feelings with Mr. Heins to determine whether or not your feelings are correct?

A No, I have not.

Q Now, Dr. Feld, in 1983, without Midland, if we look at the Detroit and Consumers Power area we have a 19.5 percent reserve, which is .5 percent below what Consumers thinks is adequate for the system.

Would you agree with me that 19.5 percent is also adequate for Consumers' system?

A Do you mean for Consumers' system, or for the --

Q And for Detroit Edison. In other words, would you move forward to try to get Midland on line in order to move the figure from 19.5 percent, higher?

A (Pause.)

Q Do you understand my question, Dr. Feld?

A Yes, I do.

Q Are you concerned about a 19.5 percent in light of Mr. Heins' testimony that he wants a 20 percent reserve?

A Yes.

Q You are?

A And I'd like to explain why.

Q Sure.

A This 19.8 percent assumes a certain amount of peak demand coming from other ECAR companies. The review of the other ECAR companies suggests that the reserves at peak are also not going to be sufficiently high for them to presumably be able to help out the Michigan Electric Coordinating System.

Furthermore, in the analysis by Mr. Gunderson at the Federal Power Commission, his analysis suggests that a one day in 10 year reliability for the Michigan Electric Coordinating System is approximately 32 percent.

MR. CHERRY: I move to strike the testimony about Gunderson's analysis unless it's produced.

CHAIRMAN COWAL: Where does that come from?  
Mr. Gunderson hasn't testified, has he?

MR. CHERRY: No, and I was told that it was in draft form, and clearly I have not been told the truth.

MR. BREWER: I object to that. I don't think it's appropriate for me to have to stand up and explain the status of that testimony at this time, but I'll be happy to.

The initial reason I did stand up was to oppose the motion to strike most strongly. Dr. Feld has been asked questions, and in response to those questions I think he's been

helpful to the Board and the record in explaining the bases for his answers. As part of that answer, he explained the bases in terms of information supplied by another expert that he has relied on for that matter.

If the Board cares to hear the status of Mr. Gundersen's work, I would be glad to state it.

CHAIRMAN COUFAL: Well, we'll overrule the motion to strike, Mr. Cherry. If you want to go into Gundersen's work with the witness you may do that.

MR. CHERRY: Mr. Coufal, can we apply the same rules to the Staff as well as me? You made me jump through hoops to get them all the underlying data with respect to Dr. Timm's testimony. I have now asked for a copy of the study which this witness has relied upon in his answer. May I have it, sir?

CHAIRMAN COUFAL: I'm not ruling on that at all, Mr. Cherry. I was ruling on your motion to strike.

MR. CHERRY: All right. I'm now asking you to direct production of that document, in whatever form it is, because this witness has relied upon it. The Regulatory Staff made a representation in a letter to me that they gave me all of the backup for the document. That letter is dated --

CHAIRMAN COUFAL: Have you got the document?

MR. BRENNER: Yes, sir. I'd like to respond to that and explain where it is. I think Mr. Cherry confused the



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chronology, or he wouldn't make those charges. We did represent that we supplied all the backup for Dr. Wold's testimony at the time it was requested. We in fact did so.

Mr. Gunderson's work was not in existence at that time, and in fact, I did not even know of Mr. Gunderson's existence at that time.

Mr. Gunderson is an employee of the Federal Power Commission. In preparing possible rebuttal in this proceeding, in order not to be in a position where we'd have to tell the Board we need "X" number of weeks to prepare rebuttal, now that everything else is in, we have been preparing rebuttal on the run, so to speak.

Mr. Gunderson, in anticipation of a line of rebuttal that counsel for the Staff wanted to make -- and I might add, this was even before we knew of the existence of Dr. Timm's testimony -- has prepared an analysis of loss of load probability. Mr. Gunderson is an expert in this field. That analysis has been prepared in the form of testimony.

We have copies here. We still consider it a draft, and I'll explain why. He did everything we needed up until this point, but the proceeding is still continuing. Now that we have seen Dr. Timm's testimony, we are attempting to develop a possible further rebuttal and/or cross-examination on that subject of Dr. Timm.

So there are undoubtedly additions that will go in

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the loss of load probability study.

In consulting Mr. Gundersen, Mr. Gundersen acted not solely as a consultant to me, as an attorney, but also as a source of expertise for Dr. Feld with respect to that area. And Dr. Feld and Mr. Gundersen and myself had many conversations in the preparation of this document. The document does exist in the form of testimony. The reason it is not filed I've just explained, in terms of our preparing rebuttal. And I still have some problems with the Board possibly making me furnish rebuttal by February 28 before I have a chance to cross-examine Dr. Fiam, which is something I wanted to raise again at the end of this proceeding.

Having said all that, just to, I hope, explain that there is nothing nefarious about, I'd be happy to supply copies of the document with the understanding that we'd reserve the right to add to it, modify it, or whatever, before we consider it to be the final testimony by Mr. Gundersen.

I may even exercise an option not to present it in the form of testimony if I think the record adequately covers the point.

CHAIRMAN COUFAL: All right.

MR. BRENNER: Mr. Gundersen is the person that would testify to that document, though.

CHAIRMAN COUFAL: I understand.

MR. BRENNER: Having said all that, does Mr.

Cherry still wish the document?

MR. CHERBY: I did not hear myself withdraw my request.

MR. BRENNER: I reserve all possible objections to the use of the document. I'll make it available. I don't think it's necessary that I do it at this moment, but I can if that's what you want.

CHAIRMAN COUFAL: Make it available, did you mean?

MR. BRENNER: Yes.

CHAIRMAN COUFAL: Well, why don't you, and then we'll get on with it.

MR. BRENNER: Okay.

Dr. Feld, I might inquire if you have a copy?

THE WITNESS: No, I don't.

MR. BRENNER: I have a six-page document, and in addition to the six pages there are four attachments consisting of a total of four pages for the attachments, and, therefore, a total of 10 pages.

The caption on the front page reads: "United States of America, Nuclear Regulatory Commission, In the Matter of Consumers Power Company, Midland Nuclear Power Plant Units; Numbers 1 and 2, Docket Nos. 50-329 and 50-330, Testimony of Walter J. Gunderson. I would emphasize that it's been typed in this form in possible anticipation of using it in this form, if nothing else had occurred.

Subsequent to the typing of it in this form, something else had occurred. In fact, several things had occurred, both on the record of this proceeding and the proffering of Dr. Timm's testimony.

CHAIRMAN COUFAL: Okay.

(Documents distributed.)

END 7  
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MR. CHERRY: Mr. Chairman, may I inquire where the backup to this testimony is, whether it is also available in the form of the computer runs and other various studies?

MR. BREWER: I am confused. When you said this testimony, do you mean --

MR. CHERRY: The Gunderson testimony that Mr. Feld said he relied upon.

MR. BREWER: Mr. Chairman, I think that is a mis-characterization, especially in light of the chronology I just explained; relied upon for his initial written testimony.

CHAIRMAN COUNAL: All right; go ahead.

MR. CHERRY: All I want to know is if it is here.

CHAIRMAN COUNAL: That's why I asked him, Mr. Cherry.

MR. BREWER: I am sorry, sir.

CHAIRMAN COUNAL: Is the backup material for this testimony or this document which may not be testimony here.

MR. BREWER: No, it is not.

I assure it is in Mr. Gunderson's possession.

MR. CHERRY: May I ask that it be delivered to me on a prompt basis, Mr. Chairman?

CHAIRMAN COUNAL: Do you have any idea, Mr. Stephens, or you, Mr. Feld, what the backup amounts to? I have not read this. Are there internal references to backup?

MR. BREWER: There are runs, continual runs.

CHAIRMAN COUFAL: Pardon me?

MR. BREWSTER: From the Federal Power Commission, on the Federal Power Commission's independent loss-of-load probability analysis.

MR. CHERRY: When I would like to see the runs plus the computer code so I understand what the inputs are. And I don't like to take the time to read this right now, but I would like to see anything else that Mr. Stenger believes to be fairly falling within backup data, using the analysis that he made of Dr. Timm's testimony, so that he could fully understand it.

CHAIRMAN COUFAL: I think there is a problem about whether or not it is producible, but we will ponder that, Mr. Cherry. This is not testimony obviously; it is a paper that Dr. Feld -- can I finish please? -- that Dr. Feld relied upon he said, just now in answering a question.

Now if you have got to rely on every bit of backup data to every piece of paper that an expert relies on, there just isn't any limit to what is going to have to be delivered.

And for that reason, I would like to think about that some.

MR. BREWSTER: I would ask Mr. Chairman, if I correctly understood Mr. Cherry's last request that he come of counsel in there. But Mr. Cherry has made a big point of not turning over discovery that was prepared for his use in

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cross-examination of Dr. Timm's testimony because I haven't been able to get all my experts together with all the materials. When I do have such an analysis for purposes of cross-examination, Mr. Cherry's own statement that in his view that it is not discoverable documents.

With respect to backup documents to any testimony that we choose to file of Mr. Gunderson's, I will go on further when Mr. Cherry has ever done for us simply with respect to Dr. Timm's testimony. Our filing date is February 28th. At the time I file that, I will file the backup computer runs that Mr. Cherry has asked for with that testimony.

I am not sure how voluminous it is. If it is not very voluminous, I will photocopy it and send it to him. If it is very voluminous, what I may try to do is make it available in a central location in Chicago so that both the Licensee and Mr. Cherry can view the same material.

I think that is more than what is required of me and it is fair under the circumstances. I would certainly not want something like that to delay the proceedings, either.

CHAIRMAN COFFAL: Okay.

MR. CHERRY: When you say you will send it to a central location, do you mean Glen Ellyn, Illinois? Because if you do, the undated memorandum --

CHAIRMAN COFFAL: Let's don't get sidetracked on that discussion. We will solve that when we get to it.

MR. CHERRY: Okay. I assume that Mr. Brenner will address himself to that before I turn over what he is asking for for Dr. Feld, or I will put it in a central location in Chicago.

BY MR. CHERRY:

Q Dr. Feld, would you turn to page two of your testimony?

MR. BRENNER: Mr. Chairman, I will respond to that now.

I have made documents available at Mr. Cherry's office. We gave him the stuff. I made documents available practically across the street, but he refused to cross the street and look at them. I have made available voluminous documents that were staff information.

When he has documents here available in the courtroom that he is unwilling to give me, I think the Board should take note of that.

MR. BRENNER: When I said a central location, that is only if it is very voluminous. If it is not, I am going to copy it and give it to him.

CHAIRMAN COURAL: So ahead, Mr. Cherry.

BY MR. CHERRY: Would you turn to page two of your testimony, Dr. Feld?

In forecasting demand, you say in the second sentence; prior to 1973 "view envisioned," and then you have



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 a list of things. Do you include the Midland Intervenor as among the few who envisioned these problems?

A. I am sorry; I don't understand.

Q. Would you credit the Midland Intervenor with among those precious view who forecasted prior to 1973 that there would be problems in electric growth for various reasons?

MR. BRENNER: Mr. Chairman, I can't find -- what was the page number again?

CHAIRMAN COUNSEL: Page 2, the last paragraph entitled forecasting demand, third line.

THE WITNESS: I wasn't aware that the Midland Intervenor had done so.

BY MR. SHERRY:

Q. Have you read our petition to intervene, the original one back in 1971 that had 30 pages of contention on need for power and suggests things; rise in electricity, shortage of fuel, cut off of foreign supplies, or others?

A. I can't recall if I did. If it was placed in the FES, I think I did review it.

Q. Are you aware that the Regulatory Staff in 1971 took the position that all of those matters were beyond the scope of the hearing?

MR. BRENNER: Mr. Chairman, I object to that as seeking a legal conclusion and/or comment -- I don't see where

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it is going, in addition to that objection.

CHAIRMAN COUFAL: Sustained.

BY MR. CHERRY:

Q Mr. Feld, would you turn to page 5?

In the second paragraph you list some factors as having a tendency to reduce the growth in electricity, including conservation, economic recession and higher prices for electricity.

Now you were here during the cross-examination of Consumers witnesses on need for power; were you not?

A I would say for the most part, yes.

Q Would you agree with me that the forecasting methodology which is not -- does not specifically include sensitivity to price elasticity makes that forecast and study less than reliable?

A No, I would not, and I would like to explain that, if I can.

Q Sure.

A I think we will all agree that higher prices are going to reduce the demand for electricity. Now whether an individual develops an econometric model which specifically develops price elasticity has to quantifying, or if they do so in an objective approach as Consumers has done, the end result is the same. Both of them have factored in higher prices, but Consumers Power did not do so via econometric

approach.

Q Is it your testimony that you have reviewed Consumers Power forecasting and you believe that in any fashion, price elasticity was specifically, expressly included in the study?

A Not price elasticity but higher prices, yes.

Q But not price elasticity?

A You could only develop price elasticity if you use an econometric approach.

Q Would you believe, Dr. Feld, that a utility who aggressively pursues and implements an inverted rate structure would be taking an action which would have a tendency to reduce load growth?

A I am sorry; could you repeat that?

Q Dr. Feld, do you agree that inverted rate structures have a dampening effect upon the use of electricity?

A No.

Q You do not.

Do you believe they have any effect on the use of electricity?

A I don't really think it is clear as to what effect they have. And I would like to explain that, if I could.

The only analysis that I have seen that has attempted to look at the inverted rate structure or move towards flattening rates, is a study by Chapman, Dwight Chapman, that was prepared by the National Science Foundation.

for the Federal Power Commission. And if you start moving toward inverted rates or flat-topping rates, the effect is two-fold:

You are going to have lower prices for those who consume less electricity and higher prices for those who consume more electricity. You are going to have it on the bottom end of the spectrum. You are going to have increased demand. And on the upper end, you are going to have decreasing demand.

And whether or not they balance each other out, or if one outweighs the other, there is no concrete evidence to suggest that -- what effect they would have.

In fact, the Chapman model concluded that, if anything, there was no effect at all on kilowatt hour sales, except possibly a slight increase in kilowatt hour sales.

Q Have you taken into effect in your analysis of the future of demand and load growth effect, the fact that Consumers Power has taken a position against the inverted rate structures of any kind?

A No, I have not. And the reason why is because, as I just identified, there is no evidence to suggest that kilowatt hour sales are going to be affected in any appreciable way.

I might further say, or I think it is important to say here, that there is also a lot of concern among economists

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as to whether or not an inverted rate is very meaningful from an economic efficiency standpoint. By that I mean it doesn't identify -- it doesn't go to the core of service concept. And there are several economists who have addressed this issue and have so stated that inverted rates is not the way if you are looking for a moral or social objective via inverted rates to help the poor.

For example, the approach would be -- one should adopt a much more direct approach, not via an electric rate structure.

Q Anything else you want to add, Dr. Feld?

A No.

Q Dr. Feld, do you believe that Consumers Power's analysis is adequate in reflecting energy conservation for the future?

A Yes.

Q Do you believe that Consumers Power as a company is aggressively pursuing elimination of waste in attempting to reduce demand?

A Within its own operation, I would say most assuredly.

Q I don't mean within its own operation. I mean within its service area.

A I hadn't completed my answer with respect to trying to influence demands of its customers. I would think

that utilities simply to inform, provide the knowledge to have consumers adopt conservation measures. I don't think that they can force the consumer to conserve.

Q. Is it your understanding that Consumers Power Company is actively pursuing an active policy in an effort to reduce demand in eliminating waste in their service area?

A. I guess I don't know what you mean by an active program.

Q. I want to establish a program with a goal to determine that electricity is wasted and then find ways to make certain that that goal is reached?

A. I think they have identified several programs that would achieve those objectives.

Q. Dr. Feld, you told us that you do not believe it is a utility's responsibility to change people's habits, just give information and let the public decide, right?

A. Yes.

Q. Now is it your testimony that Consumers Power's elimination of waste and conservation program goes any further than what ever informational programs you have just defined?

A. Yes.

Q. How much further does it go?

A. I can think of one program at the moment and that involves installation of gas customers. And they provide low term loans for these customers to put -- the insulation

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will have an impact, will reduce the demands during the air conditioning season and therefore influence -- reduce electricity consumption.

Q Have you taken into consideration, Dr. Feld, that the government may institute mandatory conservation programs?

A I say -- I think I would say no to that answer.

Q You think that is a possibility in the next five years?

A It certainly is a possibility, but I would like to try to explain that a little bit further.

Q Explain the possibility of it? I don't want you to explain that. I just want to know if you have taken it into account and you said no, and I asked you if you thought it was a possibility and you said yes.

A I don't want you to speculate on what kind of legislation will be passed, Dr. Feld.

A I guess I wanted to respond why I didn't take it into account in the forecast.

CHAIRMAN COUFAL: Go ahead, Mr. Feld.

THE WITNESS: The mandatory conservation energy programs that have been identified here as potential or possible for the future identify some fairly significant energy saving and conservation.

But there is a distinction that has to be made between energy conservation and reduction of electricity demand.

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At the same time that federal programs are calling for reduction in energy conservation, they are also -- there are also very noticeable shifts toward electricity between energy sources because of the availability and supply considerations associated with the different fuel or energy sources.

So in that sense, I don't think that the mandatory programs are going to have that much of an impact on electricity consumption per se.

BY MR. CHERRY:

Q And I take it the NRC has so informed President Carter so that Dr. Schlesinger will -- and the President, will not be pursuing any of this legislation.

MR. BRENNER: Mr. Chairman, I don't think that calls for a meaningful answer from this witness.

CHAIRMAN COUFAL: Yes.

Sustained.

BY MR. CHERRY:

Q Do you know whether the NRC has officially taken that position and informed the White House that mandatory energy programs will not have any impact and therefore, they should not be pursued?

A I didn't --

MR. BRENNER: I think that is the same objectionable line.



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CHAIRMAN COUFAL: I think he can answer as to whether he knows the NRC is officially taking that position.

THE WITNESS: I think the way the question was worded is not what I said.

I didn't say the NRC has taken a position that energy conservation would have no effect. I said that impact electricity demand might be significantly less than what we are talking about for all of the energy sources.

BY MR. CHERRY:

Q. Have you done any analysis of specific legislative proposals to determine what impact it would have, or not have, in terms of reducing demand any place?

A. I can cite one analysis that I am aware of. It wasn't an analysis that I performed.

Q. And that analysis said that mandatory energy conservation would not, in the total scheme of things, have much of an impact?

A. Not the total energy but that the effects on electricity would be appreciably less.

Q. And who prepared that study?

A. The Federal Energy Administration in its National Energy Outlook has adopted an energy conservation scenario which is pretty substantial and it calls for something like \$250 billion investment with all sorts of mandatory control promoting energy conservation. The objective by 1985 is

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something like 15 percent reduction in energy demand below what is the base case projection.'

With respect to electricity, it is something like five percent reduction from what was projected.

MR. CHERRY: I don't have any further questions.

CHAIRMAN COUFAL: Mr. Brenner, do you have any redirect.

MR. BRENNER: Does the Board have questions?

DR. LEEDS: Yes.

Do you want to go after us?

MR. BRENNER: It doesn't matter. I have some questions now and then I wanted to ask two or three others after you depending on what happens.

DR. LEEDS: Let me go first and then we can clean it all up at one time.

#### BOARD EXAMINATION

BY DR. LEEDS:

Q Dr. Feld, when did NRC receive information regarding this probability encoding method?

A I became aware of the probability encoding sessions at this hearing when it was presented by, I guess, Mr. Heins.

Q When he presented his testimony?

A Yes.

Q Have you made an evaluation of this method in any respect? Do you know of any other utilities where, for

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example, that use it?

A. I would say that the most serious weakness associated with something like the probability encoding methodology is that the methodology and the assumptions that go into that defy any kind of validation on the part of anyone who wants to make a determination of how reasonable is.

All you essentially get is the bottom line, the end result. And in that case, the probability encoding methodology, in my opinion, is not one that I would have much confidence in or faith in, at least I couldn't validate it.

But that is not to say that the end result, the bottom line, is incorrect, if the experts in their subjective evaluation happen to be good experts; it is quite possible that that result will in fact prove correct.

Q. If we accept arguendo that it was a valid and acceptably methodology, okay? Has the Staff made any evaluation of the spread of numbers that they got? We were presented with a single number as a result.

Have you made an evaluation of the spread of the numbers; high, low, probability associated with those?

A. No, I have not. I have taken the most probable estimate.

Q. Do you agree that the most probable estimate, as they define it, is correct as a point to take?

A. I can't say that within their forecasting

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methodology if that was the correct number, that they should have come with it.

I feel that it is right in terms of other forecasts I have considered for the Consumers Power System.

Q Maybe I didn't put my question to you correctly. Let me try it another way:

Accepting the probability encoding method as discussed by Mr. Mosely, as I understand it, he comes up with a curve which is associated with a percent growth number and probabilities associated with different values.

My question is:

When you go to a method like that, do you need to evaluate the different numbers and look at the probabilities, and you look -- or you look at what you call the spectrum of results rather than a single particular number?

In other words, is the criterion most probable value, which I gather is 50 percent chance or something like that?

A I honestly don't know enough about that type of methodology to answer. I would expect that the range of values would be an important factor.

Q Do you know if anyone else uses it anywhere else, in any other areas?

A I won't say that exactly that approach, but a similar type approaches; yes.

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Q Where?

A About two years ago I took a course on the future of costs and it identified methodologies such as this. And they had much more fancier names, such as Delphi technique and so forth.

And my understanding is that the Japanese government in most of its long-range important decisions relies on such a methodology.

Q They use the Delphi method, if I remember correctly, isn't that a method in which you try to get trends rather than quantitative numbers?

A It doesn't have to be. You can use it to come up with a number.

Q Do you know how Detroit Edison and Consumers Power between themselves allocate reserves in the Michigan pool. I am not sure of the exact name for it, but there is a pool operation. How do they allocate reserves?

A I believe that they are -- they each assume that they will be able to maintain their own level of reliability, 20 percent let's say, and that in actuality, because of errors in forecasting and delays in construction and so forth, one might be less than the other at any given point in time.

But I think the objective is that they each maintain their own level of reliability.

Q Is that an equal percentage method?

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A. I am not exactly sure, because if you combine the systems then -- when I looked at the combined system I have to weight them because Detroit Edison is a larger entity than Consumers Power.

Q. Let me ask the question in a different way:

I think you stated that each maintains its own reserve and 20 percent is the number for the combined systems; 20 percent?

A. Yes.

Q. So each must maintain 20 percent reserves. And my question very simply is this:

That is an equal percentage system; isn't it?

A. Yes.

Q. So that means that when you put these two systems together as a pool, you require 20 percent reserves?

A. Correct.

Q. And they always operate together as 20 percent reserves?

A. That's their goal.

Q. So if one of them has more than 20 percent, does that mean that he is supplying extra reserves?

A. That would be the implication.

Q. So they only to -- have to supply 20 percent?

A. Well, --

Q. Have to?

Q There are cost penalties associated that would be assigned to -- if one of the companies was making -- it depends on the other company's capacity and energy, there would be cost penalties assigned to them.

Q Let me go back then, because I was really not quite clear in understanding something when Mr. Cherry asked you a couple of questions. And I want to go back to that and try to bring it forward with -- together with the question I just asked you.

Q Could I refer you, please, sir, to your table on page 5, table 1. And pardon me if I go over something again. Mr. Cherry asked you to write the numbers in there for Consumers Power. And if my notes are correct on the first line where it was Midland on-line as schedule, the 19.3 percent is for the combined systems and then you gave a 36.2 percent.

Q So that means that, I guess -- would I correctly interpret that to mean that Consumers Power is supplying 13 percent extra reserves to the system?

A I don't know if it is fair to make that characterization. It may well be. What might be a relevant number to consider is that Detroit Edison in 1991 would have an 3.7 percent reserve.

Q So if I made another column then, and it sounds like you have that data there; could you read it off for me

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then? I will make a column in there; Midland on-line as scheduled, and I will write Detroit Edison reserve, right?

A. 0.7 in 1931.

Q. And then give the next two numbers.

A. 10.2 and 11.9.

Q. And Detroit Edison just sold 200 megawatts or thereabouts, of a plant?

A. Yes.

(Board conferring.)

Q. Let me quickly whip through here because I think I have a couple more.

You list on page 1 of your testimony major cities, major cities within the service area; Grand Rapids, Flint, Kalamazoo, Lansing and Battle Creek. Do you know anything about these cities? Their demands?

A. My general impression is that they are highly industrialized.

Q. They are highly industrialized? Let's take Lansing; what do you know about Lansing?

A. Really not very much.

Q. How much does Consumers sell to Lansing?

A. I don't have a breakdown by city.

Q. Do you know whether or not Lansing generates its own facilities, whether Consumers Power has generating facilities in Lansing?



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Do you know whether the city of Lansing generates  
any of their own?

A. No.

CHAIRMAN SCOFFER: No they don't or know you don't  
know?

THE WITNESS: No, I don't know.

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p. 9

Q. You don't know? Did you check to see whether these cities happened to have a visible generation capability?

A. Well, it's my understanding that if they are identified as within the Consumers Power service area, then that means that they are being supplied by Consumers Power.

Q. What about--if you look at a map of the state of Michigan, what about the muni-coops? Are they not also in the service area, some of those municipalities and cooperatives?

A. They would be "whited out" of the Consumers Power service area.

Q. How would you know whether they were included or not?

A. Perhaps by looking at a map of the Consumers Power service area I could.

Q. But you did not check specifically?

A. I have -- well --

Q. Would it make any difference, for example, if Lansing were a municipal that generated its own power?

A. I would think there would be a very strong inconsistency there, because it's been identified as being supplied by Consumers Power and now we're saying it might be supplied by a municipality. It can't be counted twice.

Q. I would suggest you check, because my understanding is that Lansing generates their own.

Do you have something you could refer to?

b1: 2

A. I may.

(Witness examining documents.)

Yes, I have a map here where Lansing is "kicked out" of the Consumers Power service area, which would suggest that perhaps it was incorrect to identify Lansing as being a part of the Consumers Power service area.

Q. Have you made an evaluation of the effect of the sale of portions of Midland or Campbell or whatever else with respect to wholesale sales of Consumers Power Company?

A. Did I make an analysis of those sales? No.

What I did was I argued or I reasoned with myself that to be conservative I would consider the capacity of the Consumers Power system assuming that those sales did not take place; therefore, the capacity figures that I reported in this table are higher than what Consumers Power would report.

Q. Thank you, sir.

CHAIRMAN COOPER: Dr. Luebke?

DR. LUEBKE: No questions.

CHAIRMAN COOPER: Does anyone have any cross on Dr. Leedy's questions before we go to Mr. Spenser?

MR. CHERRY: I just have one question.

QUESTIONS OF BOARD MEMBERS?

BY MR. CHERRY:

Q. If we go to page 5 and just pick 1983, you have a

bit 3

32.4 percent reserve if we just consider Consumers and 11.9 percent reserve if we just consider Detroit Edison.

If I minus those two, I don't come out with 19.8. Should I do something else besides minus those two figures?

A. Yes.

Q. What else should I do?

A. Detroit Edison is a significantly larger system than Consumers Power; therefore, there's a weighting factor that should be applied to each.

Q. But even under your examination of Detroit Edison's conclusions, because you said you didn't talk with them or look at the underlying data, you've told Dr. Leeds that Detroit Edison assumes a need for 20 percent reserve on their system; is that correct?

MR. BRENNER: Mr. Chairman, I object to a mischaracterization of the testimony in that question.

Dr. Fold did not testify that he in no way looked at the underlying data in the forecast. I think that was clear from the series of questions and answers. He did state that he did not talk to them directly.

MR. CHERRY: He also stated that he didn't look at the data. He looked at what was in the SR, what was in the Rural PSRR; and I would bring to the Board's attention the conclusory nature of those documents.

CHAIRMAN COUFAL: I seem to recall that he said

b1c 4

that a good number of the assumptions that were made to arrive at the conclusion were stated in the documents he reviewed.

Is that right?

THE WITNESS: Yes.

CHAIRMAN COUFAL: Okay.

I've lost track of the question. Can you ask it again, Mr. Cherry?

MR. CHERRY: No, I'm through.

CHAIRMAN COUFAL: All right.

Mr. Brenner?

Mr. Pribila, or Mr. Benfrow? I don't mean to cut you out.

(No response.)

REDIRECT EXAMINATION

BY MR. BRENNER:

Q Dr. Fold, on the first page of your testimony, the sentence that Dr. Leeds had directed you to, which reads:

"Major cities within the service area include Grand Rapids, Flint, Kalamazoo, Lansing, and Battle Creek."

Does any of your express analysis depend -- does any of your express quantitative analysis depend on the exact correctness of that sentence?

A No, not at all.

b1c 5

Q Is that sentence in that for background description rather than a basis for your analysis, then?

A I would characterize it as descriptive of the service area, and apparently an incorrect description.

Q Have you used a different starting point than looking at the cities' load in order to assess the load in the various categories of service customers for the MECS system?

A I'm sorry?

Q I'll restate the question.

So you did not approach your analysis of the load and load growth of various components of the MECS system by looking at the load on a city-by-city breakdown?

MR. CHERRY: Objection. Leading.

CHAIRMAN COUFAL: It sure is, Mr. Brenner.

MR. BRENNER: Mr. Chairman, I think I'm entitled to lead on redirect where an error in part of the testimony is disclosed in order to clarify the record.

CHAIRMAN COUFAL: I think you may examine on redirect and do whatever you want to that's proper redirect, but I don't think you can lead.

MR. BRENNER: I'll restate the question, if I might.

BY MR. BRENNER:

Q Did your analysis or analytical approach include a city-by-city breakdown of the load makeup on the system that you analyzed?

bit 5

MR. CHERRY: The same objection.

CHAIRMAN COTRAN: Overruled.

THE WITNESS: No. One forecasts usually by class of customer, major customer class, and one does not forecast by taking geographic portions of the service area.

BY MR. BRENNER:

Q Dr. Feid, turning to page 8 of your testimony, Table 1, do you recall that there were questions from both Mr. Cherry and the Board requiring you to add columns to this table?

A I'd like to ask you in that light if you have available a column which would indicate the reserve margin for those three years if you assumed that Midland is delayed beyond the 1963 period?

A Yes.

Q Could you give those figures, please?

MR. CHERRY: Beyond 1963? Is that the question?

MR. BRENNER: That was the question.

CHAIRMAN COTRAN: Yes.

MR. CHERRY: May I ask the relevance of that to this suspension hearing? I don't know that anybody has analyzed Consumers' position in that area. It wasn't gotten into in the hearing; it's not part of the testimony; it's not part of the cross.

CHAIRMAN COTRAN: Mr. Brenner?

b1c 7

MR. BRENNER: Yes, sir.

Maybe Mr. Cherry misunderstood my question. I'm not asking for Dr. Feld to go into years beyond 1983. I'm asking him to give us the reserve margins for those three years, 1981, '82 and '83, if we assume that Midland is delayed beyond the point where it can come on line in those years.

I think the relevance goes to several points.

CHAIRMAN COOPER: I think it's relevant. Go ahead, Mr. Feld.

THE WITNESS: The information does appear on the Draft Environmental Statement. Would you want the capacity figures as well, or just the reserve margins?

BY MR. BRENNER:

Q Perhaps it would be easier on this record, and with the Board's permission, if you just gave the reserve margin and also referenced the table in the draft supplement to the Final Environmental Statement so that the derivations can then be seen by anyone.

A All right.

The table is 4.3, and 1981 would be essentially the same as the delay case, 14.2.

1982 would be 12.9, and 1983 would be 11.6.

DR. LEBDES: That's the combined system?

THE WITNESS: Yes.

DR. LEBDES: Why don't we just get it complete?



Let's get all of them.

THE WITNESS: Do you want it for Consumers Power alone?

DR. NEEDS: And D.E. alone. We might as well get it all. Do you have those there?

THE WITNESS: Yes.

With Midland delayed beyond '33, the reserve margins for Consumers Power would be 23.6 for 1931, 17.6 for 1932, and 11.7 for 1933.

For Detroit Edison, there would be no change at all, because the capacity of Midland is not a component of the Detroit Edison capability.

BY MR. BRENNER:

Q Dr. Feld, Mr. Cherry pursued a line of inquiry, or at least one question, with respect to the reasons for considering the Detroit Edison and Consumers Power systems together as the MECS.

You gave one reason, that they were interconnected, and stated that you had other reasons. Could you give those other reasons?

A Yes.

A lot of utilities are interconnected. With respect to Consumers Power and Detroit Edison, they dispatch power and energy as a single entity.

And the other items that I think are relevant are

bit 9

that the Nuclear Regulatory in its initial review of the Midland case identified the Michigan Electric Coordinated System as the relevant service area to analyze reliability, as did the Michigan Public Service Commission and the Governor's Advisory Commission on Electric Power Alternatives for the State of Michigan.

MR. BRENNER: That's all I have, Mr. Chairman.

MR. CHERRY: Could I just ask one other question?

RECESS EXAMINATION

BY MR. CHERRY:

Q When you were talking about reserve requirements, you were assuming no additional capacity of any kind was added either by Consumers or Detroit Edison, is that correct?

A No. This includes all capacity additions out to 1983 by Detroit Edison and Consumers Power.

Q Consumers Power doesn't plan to bring any plant on line after 1980, isn't that correct, other than Midland?

A My recollection is that they don't, but I could check that.

Q And your testimony indicates in other places that Consumers could have a coal-fired plant on line by January 1, 1984, in your alternative.

A Yes.

Q So that Consumers could solve that reserve problem by building that coal plant that you talked about, that is

blt 10

percent reserve, in 1984?

A I don't think I addressed 1984 at all.

Q Or 1983.

A No, they couldn't. It would be coming on in '84.

Q You're telling me that it's impossible to get more generating capacity of any kind in 1983 except to build the Midland facility?

A No, I didn't say that.

MR. CHERRY: I don't have anything else.

FURTHER EXAMINATION BY THE BOARD

BY CHAIRMAN COOPER:

Q Mr. Feld, when Dr. Leeds was asking you some questions, he asked you about Lansing. I don't want to do anything except try to recall with you what you said.

As I recall, you said you weren't aware of whether or not Lansing had its own generation, that is, a muni plant, is that correct?

A Yes.

Q And you recall you said that Lansing was listed as one of the areas or one of the cities in the Consumers service area. Is that correct?

A I have since identified that I don't believe that is the case, because I have a map of the Consumers Power service area which has Lansing deleted from it.

Q I agree with you. You did say that, and I'm not

b1: 11

trying to exclude that from consideration.

You also made a response, as I recall, to something that Mr. Leeds said that if you had included the city of Lansing as a Consumers service area component and they were not in fact, that would be a serious discrepancy or a serious inconsistency. Do you recall saying something to that effect?

A. I may have said "serious." I don't know how large Lansing is. But it would be a case --

Q. Well, strike the word "serious." Did you say it would be an inconsistency or discrepancy?

A. Yes.

Q. What do you mean by that, if now you say in response to Mr. Bronner's questions that it really didn't make any difference at all?

A. I'm saying if Lansing is being supplied by a municipal Consumers Power is identifying Lansing as part of the system, then Lansing is going to be supplied twice, which is inconsistent. That's double counting.

I feel very comfortable that, based on the map itself, if Lansing is a muni it's not accounted for in the population and industries that are identified as being part of Consumers Power service area.

Q. Well, would that comfort that you feel come from a feeling that your analysis is correct irrespective of whether or not it is, or would your comfort come from the

p. 12

fact that you rely on Consumers to properly analyse the situation vis-a-vis Lansing and Consumers?

That's a heck of a question. Do you understand?

A. I guess there is a considerable discrepancy there, and I really don't have the answer for you. How important it would be to the Consumers Power Forecast would be a function of what kind of demand existed in Lansing. It may be a relatively insignificant problem. I don't know. It could be significant.

Q. Do you know of any large industrial areas in Lansing?

A. I believe there are.

Q. If I told you that was headquarters for Oldsmobile and much of that is served by a wind system in Lansing, would you find that hard to believe?

A. No.

Q. Would you consider Oldsmobile would be a major user of electricity?

A. Yes.

Q. Do you think it's worth looking into?

A. Yes.

Q. I agree. I used to live in Lansing.

(Laughter.)

DR. NEEDS: Let me ask another question.

bit 13

BY DR. LEEDS:

Q Does that map you have show Consumers Power service area in what respect -- retail, wholesale, or otherwise?

A It's a map that I drew. It was based on a representation of Consumers Power's service area. I believe it appears in their annual report. I can show you.

Q What are some of the white areas?

A Lansing. Interestingly, Lansing is really the only one that's defined. The others are just areas.

Q Might they be selling wholesale to those other places?

A No.

Q Why not?

A Typically, sales to others picks up sales to co-ops and municipalities and so forth, so that would be a part of the Consumers Power service area.

Q A part of the Consumers Power service area.

The areas aren't identified? For example, Alpena, Wolverine Cooperative?

A No.

Q A muni-coop pool, is that indicated at all?

A No.

Q Holland, Cherry -- I think there's one called Cherryland or the Cherry Cooperative. Northern Michigan, I think, is another cooperative. Are any of those indicated?

bit 14

A. They're not identified. They're just blank areas on the map.

Q. I see.

I'll ask the Chairman's question again now. Do you think that's important enough to be looked into?

A. Yes.

Q. Thank you, sir.

CHAIRMAN COUFAL: Any questions?

MR. RENNICH: Yes.

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## FURTHER CROSS ON BOARD EXAMINATION

BY MR. RENNICH:

Q. Dr. Feld, you told the Board it was important to look into this area. I'd like to take you back to the second page of your testimony.

You talk about major cities within the service area. You include Grand Rapids, Flint, Kalamazoo, Lansing and Battle Creek, which is where I believe all of this started.

For your testimony, what you've based this on, your testimony on, is whether Lansing is included in the service area important to your testimony or not?

MR. CHERRY: Mr. Chairman, I'm going to object to that question. It clearly is a redirect line of questioning. It was inquired into by Dr. Feld's other attorney, Mr. Brenner. I just don't think it's proper at this point.

CHAIRMAN COUFAL: Overruled.

b1c 15

MR. BRENNER: Mr. Chairman, I would like that remark stricken. I don't think I have to specify which remark.

We shouldn't allow that thing to go on in my humble opinion.

CHAIRMAN COUPAL: We'll strike the remark about Mr. Feld's other attorney.

Answer the question.

THE QUESTION: The analysis that I looked at is a forecast based on customer class. What concerns me now is does Consumers Power's forecast -- they have residential, commercial, industrial, and then other -- does that other include sales to Lansing, to the Lansing muni, that are a part of its class customer service.

If they do, is Lansing also going about its own business -- is that muni going about its own business, also building the means to provide its own service for that area?

If that is the case, then it seems to me there is a case of double counting, counting that demand twice.

I just honestly don't know at this point in time whether the CP forecast includes Lansing or it does not include Lansing.

BY MR. RENFROW:

Q So that if both Consumers and Lansing were saying they were supplying energy for Lansing, then that would be double counting?



blt 16

A. Yes.

Q And, therefore, it might have some effect, depending upon the amount that the possible double counting was for, as to your testimony, is that correct?

A. Yes.

I think I'd like to just say one further point on that. My feeling is that Consumers Power is not including the Lansing rural demand in its system, because its other customer class is sufficiently small to suggest that they aren't taking into account municipals and co-ops as a portion of that in the customer classes.

Q Do you know what percentage that is, Dr. Feld?

A. My impression is that it's in the neighborhood of 5 percent of their total kilowatt-hour sales.

MR. CHERRY: I move to strike the answer. He asked if he knew. The answer to that question is no, not "My impression is . . . ."

CHAIRMAN COUFAL: You may follow it, Mr. Renfrow, and see how strong that impression is -- or you'd better follow it and see how strong that impression is.

MR. RENFROW: Thank you.

BY MR. RENFROW:

Q Do you have documents you can refer to?

A. I believe the ER has a breakdown by the customer class.

b1c 17

(Witness reading.)

5.1 percent.

MR. CHERRY: Mr. Chairman, I'd like the record to be clear that the answer to the question asked by Mr. Renfrow should properly be "I don't know, unless, of course, I look at Consumers' ER, the backup to which I didn't feel I needed to analyze because I believe everything that Consumers tells me except when it's inconvenient for my testimony."

MR. BREWER: I don't think I have to say anything, Mr. Chairman. I move that we strike that and get on with it.

CHAIRMAN COUTAL: I think it's fairly clear what the situation is.

Do you have any more questions, Mr. Renfrow?

MR. RENFROW: Just a couple, Mr. Chairman.

BY MR. RENFROW:

Q Mr. Feld, are all municipals self-generating?

MR. CHERRY: Object to the question. There is no foundation.

We don't have the geography; we don't know whether Dr. Feld knows all of the municipalities; we don't know what "self-generating" means; we don't know if he's including those within or without the Iron Curtain.

CHAIRMAN COUTAL: Do you know where you're going, Mr. Renfrow?

MR. RENFROW: Yes, sir. I can change the question

bit 18

around if you'd like for me to, Mr. Chairman.

CHAIRMAN COUFAL: Well, it's pretty broad.

MR. RENFROW: All right.

BY MR. RENFROW:

Q Mr. Feld, in the municipals and the cooperatives that we've been discussing in this proceeding -- cooperatives like Wolverine and municipals like Lansing and Holland -- taking the municipalities, are all of those capable of generating their own electricity?

MR. CHERRY: Objection. No foundation.

The witness has just indicated previously that he hasn't made an inquiry into those cooperatives. I don't think that we can ask this witness that question.

CHAIRMAN COUFAL: "Are they capable of" -- I'm a little hung up on that.

Do you mean do they have the facilities for doing that, Mr. Renfrow?

DR. LEEDS: Present facilities?

CHAIRMAN COUFAL: State your question in those terms and see if he can answer that.

DR. LEEDS: Why don't you ask him what he knows about the municipals and co-ops first? Ask him to name some, what they do and so forth.

MR. RENFROW: Well, I don't really care right now, Dr. Leeds. What I want to know is the general principle,

blt 19

when you classify something as a muni, does that mean that it has to be capable of generating its own electricity within its own system?

CHAIRMAN COUFAL: As he has used the term "muni"?

MR. RENFROW: Yes.

CHAIRMAN COUFAL: All right.

You can answer that, Mr. Feld.

MR. CHERRY: Mr. Chairman, I'm going to object to that question. It now has no material relationship to the issues in this proceeding.

What good is the answer to that general question if it has no application to the state of Michigan at all? Since Mr. Renfrow has said he doesn't care, why ask the question?

CHAIRMAN COUFAL: Overruled.

THE WITNESS: I honestly do not know if there is a requirement that a muni be able to be self-sufficient or not, and I guess that's really where my problem lies, to try to figure that out.

BY MR. RENFROW:

Q Other than self-sufficiency, is there a requirement that a muni be capable of generating some of the electricity to meet its own demand?

MR. CHERRY: The same objection. It calls for a legal conclusion as well.

CHAIRMAN COUFAL: What kind of a requirement do you

1t 20

mean, Mr. Renfrow?

MR. RENFROW: A requirement in terms of which we're speaking of a definition of a municipality in terms of supplying electricity, Mr. Chairman.

CHAIRMAN COUFAL: You mean by his definition?

MR. RENFROW: Yes.

CHAIRMAN COUFAL: I think the point's all right, but reframe the question so you ask the question that you explained to me you wanted us ask.

MR. RENFROW: Sure. I'll start back.

BY MR. RENFROW:

Q. You used, Dr. Feld, the word "self-sustaining." Would you mean that they would have to have generation capable of meeting their own demand?

I would like for you to take that word "self-sustaining" and tell me whether or not by your definition of a municipality they are required to be capable of generating at least a part of their own demand.

MR. CHERRY: Objection. It calls for a legal conclusion.

CHAIRMAN COUFAL: No, I think he's asking if his definition requires that.

MR. CHERRY: His definition is precisely what is required to define what anything is not municipalities.

CHAIRMAN COUFAL: Let's see what he says to that.

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question, Mr. Cherry.

THE WITNESS: Yes, I believe that's the case.

BY MR. RIMFROW:

Q So that a municipality could generate a portion of its own electricity and still be a municipality and then be required to purchase another portion of its electricity, is that correct?

A Yes.

Q And I believe your answer was that you do not know if Lansing generates its own electricity, is that correct?

A Yes.

Q Where would you look to find that out?

A A first guess would be -- well, I honestly don't know at the moment.

Q Have you ever seen a breakdown of the 5.1 percent that is classified by Consumers Power Company as sales to others?

A Yes, I have.

Q Do you have that breakdown with you?

A I believe it's in the ER. It identifies such things as street lighting and internal uses of electricity within the company.

(Witness reading.)

It identifies street lighting, interdepartmental sales, and sales to other utilities.

b1t 22

Q You have never seen a breakdown as to what those sales actually are, though?

A You mean the percentage of the 5 percent?

Q What that 5 percent is made up of.

A I think I have seen it, but I'll have to start digging a little bit.

End 9

LOWEL  
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Q Before you start digging, can you tell me what five percent of the sales of Consumers Power Company would be, based on the information you have before you?

A Five percent of the total sales? For 1976?

Q Yes.

A About 1,100 gigawatt hours, based on 1975 sales.

Q Okay. Now, will you look through your information and see if you do have a breakdown of the sales to others with you in the hearing room, and perhaps that will answer Dr. Leeds' question.

A (Pause)

I'm looking for a document that I can't locate. I would think that a reasonable place to look would be the piece of testimony of Mr. Bickel.

CHAIRMAN COUFAL: Well, if that's the case, it's already in the record. And if it's not the case, then the witness isn't going to be able to answer the question. So, can you drop it there, Mr. Renfrow, for purposes of this witness? If it's Mr. Bickel's testimony, how could this witness testify to it?

MR. RENFROW: I've not seen the document, so I'm not in a position to respond to you right now. I don't have that particular document, nor the transcript. Let me ask one question, and then I will leave it there, subject to the Board allowing me, after the break, I will try to find that



document to determine if it's in there. I may have an additional question further if I can find that document.

CHAIRMAN COUNAL: Well, if it's in the Bickel testimony it's in the record. If it's not in the Bickel testimony it isn't going to get in the record through this witness, because that's the way this witness said that he would determine whether or not what other sales were included.

MR. RENFROW: Yes, sir. However, I don't have Mr. Bickel here, and I may not have it in straight words but this witness may be able to take it and then, through that document, refresh his recollection and tell you how that's calculated, Mr. Chairman. That's why I would like to look at it.

CHAIRMAN COUNAL: Well, you can look at it during the break.

DR. LEEDS: Mr. Feld, have you calculated the item in question before?

THE WITNESS: Sales to others has an extremely low forecasted growth rate on the part of the company, which is, you know, if anything it has a downward pressure on their forecasted growth rate, and it represents a very small component. And I didn't really get that deeply involved in that particular component of the forecast.

DR. LEEDS: Well, my question really is: Have

LOWEL  
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Q Yes.

A About 1,100 gigawatt hours, based on 1975 sales.

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you ever calculated it, because if you haven't calculated it then how is he going to refresh your memory? That's my problem.

THE WITNESS: I did calculate it with respect to when I derived the FEA forecast for the Michigan Electric Coordinating System. I relied on the 5.1 percent estimate for the other category, which was based on 1975 sales distribution as reported to ECAR.

When you say calculate, it's a matter of taking the amount of kilowatt hour sales to that sector, divide by total kilowatt hour sales, and come up with --

DR. LEEDS: Well, yes, but it's a question of sales to other utilities, isn't it? And if you haven't dealt with those numbers in any manner previous to now, how can you refresh your memory, is my basic, logical problem.

THE WITNESS: I am not sure.

CHAIRMAN COUFAL: All right.

Any more questions of this witness?

MR. BRENNER: Yes, Mr. Chairman, based on --

CHAIRMAN COUFAL: You started to move, Mr. Cherry. Do you want to ask yours before Mr. Brenner does?

BY MR. CHERRY:

Q Mr. Feld, without starting to mince words, is it fair to state that your testimony is based upon your analysis of documents generated by other persons or sources, and you

wel 5

questions? I see what you're getting at, but why don't you limit your questions to this bit on Lansing and so on?

MR. CHERRY: Mr. Chairman, I think it's extremely important to point out with respect to the Michigan Public Service Commission study, this witness did not go look at the underlying data --

CHAIRMAN COUFAL: Well, we've been through that, is what I'm saying.

MR. CHERRY: Well, but I would think that at this late date and hour maybe Dr. Vold will apologize for imposing his testimony on this hearing.

MR. BRENNER: Mr. Chairman, I think -- you know, that's just about enough.

DR. LEEDS: Mr. Cherry, why don't you look at the first paragraph of his testimony, and maybe that has already answered that question that you're trying to ask, or maybe I'm misreading it.

MR. CHERRY: Yes. I just want to make it clear that he's not looked at that underlying data, and if that's the Board's recollection, then I don't have anything else to ask.

MR. BRENNER: Mr. Chairman, those statements of counsel would more appropriately go to findings and argument. And I'd just very briefly like to throw in --

CHAIRMAN COUFAL: We're not going to look at

statements of counsel as basis for findings.

MR. CHERRY: I'll withdraw the question, Mr. Chairman.

MR. BRENNER: I have one or two brief questions which Mr. Cherry's second cross brought up, subsequent to my prior questions.

FURTHER REDIRECT EXAMINATION

BY MR. BRENNER:

Q Dr. Feld, Mr. Cherry referred to a coal plant Consumers has scheduled to come on line in 1984. I forgot the unit number of that coal plant. Can you help me? It's Campbell number something. Do you recall, Dr. Feld?

A I'm sorry. A plant in 1984?

Q Yes.

A There is no scheduled plant for 1984.

Q Dr. Feld, in response to Mr. Cherry's question along that line, you had asked for an opportunity to verify the capacity plans on Consumers' system in that approximate time period, 1980-84. Could you do that at this time, and on the record state what your reference is?

A I'm looking at table 1.1-8 in the ER supplement of November, and Midland-2 is scheduled to come on in March of 1981; Midland-1 in 1982; Bell River-1 in 1982; in 1983, Bell River-2. That's it.

Q All right. Does that reference verify whether

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your answer -- without having made that check before -- that Mr. Cherry was correct or not?

A I don't remember the exact initial question of Mr. Cherry.

Q Mr. Cherry asked whether -- and this is a paraphrase -- whether there were other units of Consumers Power coming on line in the 1980-84 time period besides the Midland units.

A Other than Midland, there are none.

MR. BRENNER: That's all the questions I have.

CHAIRMAN COUFAL: All right.

What's your plan? Are you going to have -- I guess you'll have to go ahead with Mr. Feld on the other aspects of his testimony?

MR. BRENNER: Yes, sir. Unfortunately for Dr. Feld, in terms of stamina, we'd like to certainly take a break -- to give everybody a break including Dr. Feld, who's going to have to continue straight through because of the illness of Mr. Helts.

CHAIRMAN COUFAL: Well, after the break you're going to have what?

MR. BRENNER: I'll put in both of his pieces of testimony together. I think they are separable, but I think they're somewhat related as distinguished from the arguments I made this morning with respect to this piece

of testimony. And to avoid a big harrangue on the part of everybody, we'll put them in together.

CHAIRMAN COUFAL: That's cost of replacement power and what else?

MR. BRENNER: The economic comparison of the Midland Nuclear Plant with the coal alternative.

DR. LEEDS: Why don't we get them in before the break, so that if there happened to be any revisions or corrections or something like that, that'll solve that problem? Because I don't know whether there are or not, but ---

MR. BRENNER: I wouldn't mind, Dr. Leeds, except that Dr. Feld, I believe, has to transfer a good deal of paper around in terms of having his documents for the other pieces of testimony. Experience has shown me in this proceeding that we have not gotten stuff in for one reason or another, merely by the act of proposing that it go in.

CHAIRMAN COUFAL: That's all right, Mr. Brenner.

MR. CHERRY: I will stipulate for both of those portions of testimony in as if read now, with or without corrections, and I only have one question that refers to both pieces of testimony, and I'd be delighted to ask it now and we'll all go home.

What I want to know on both of those testimonies is in connection with the nuclear fuel cost has Dr. Feld considered plutonium recycle and plutonium reprocessing, what

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impact does that have on his testimony, and if he has considered it and eliminates it, would he then give us his judgment as to nuclear fuel costs?

That's all I want to ask him.

MR. BRENNER: That's fine. The Board and the other parties might have questions.

I'd like to take a very quick break, the normal 10 minutes, then --

CHAIRMAN COUFAL: Is the stipulation agreeable to the other parties?

MR. BRENNER: It's fine with me. We do have some corrections, and we'll make them.

CHAIRMAN COUFAL: All right, make your corrections, but the testimony which Mr. Brenner is about to identify is received subject to stipulation of the parties, and will be incorporated in the record as if read.

(The documents follow:)



looked at those documents so far as you believed necessary, but you have not gone and, in effect, checked any of those other analyses by going back to the actual underlying data of any of those analyses?

A No, I don't think that's true.

Q Okay. Did you go to Consumers Power Company and check all the underlying data of the Bickel forecast, the confirmatory study?

A Each of the forecasts that I looked at I identified all of the assumptions that were quantified.

Q Dr. Feld, my question is simple: Did you take the Bickel confirmatory study and go back and redo his calculations and check the underlying data? Yes or no.

MR. BRENNER: Mr. Chairman, I'm going to interpose an objection at this point with respect to procedure. We've gone through several rounds already, and the only questions that came up since Mr. Cherry's last round, which was not even a normal round, he just kind of jumped in, is those questions about the City of Lansing municipal. And I think it's clear -- if it's not clear, I'll make a statement of counsel that we've exhausted this witness' knowledge of that subject, and I don't know where the other supposed cross-examination is going or how it relates to questions asked since the second round of cross that Mr. Cherry had.

CHAIRMAN COUFAL: Yes. Why don't you limit your

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

CONSUMERS POWER COMPANY

(Midland Plant, Units 1 & 2)

)  
)  
)  
)  
)

Docket Nos. 50-329  
50-330

NRC STAFF TESTIMONY OF SIDNEY E. FELD ON  
COST OF MIDLAND V. COAL ALTERNATIVES

This testimony presents an up-dated cost comparison between the Midland Plant and alternative coal-fired units. For each alternative the major cost components under consideration are capital, operation and maintenance (O & M), fuel, and, taxes, decommissioning, and insurance. In addition, for the coal alternatives we have factored in the cost of interim power.

The analysis is somewhat complicated by the fact that the Midland units are already under construction and consequently, a portion of its capital cost is already sunk. In theory, one should add the sunk cost component of Midland less the salvage value to the capital costs of the alternatives as these net costs will still be borne in the event one of the alternatives is chosen. However, in this analysis no credit has been allowed for these sunk capital costs.

The fact that the Midland units are already under construction also suggests that these units can come on-line some time earlier than the coal alternatives. The applicant estimates this time differential at between two to three years and calculates a levelized interim replacement power cost of 13 mills/KWh to reflect the cost of make-up power during the 1981-1983 period. The Staff accepts the premise that in the event the coal alternative is chosen, the applicant would likely incur interim

replacement costs that could be substantial. However, the Staff's estimate is considerably lower, essentially because we have assumed that all the power can be made up internally, whereas the applicant has assumed that a portion would have to be purchased. In spite of this conservatism, and our decision to include the sunk capital costs on the nuclear side of the ledger, the following analysis still supports the conclusion that Midland is a more cost effective alternative than a coal-fired plant.

The following analysis will compare the costs of Midland, Units 1 and 2 to (a) two 800 MWe high sulfur coal plants, and (b) two 800 MWe low sulfur coal plants.

#### Capital Costs

Initially, the Staff planned to use a computer program known as CONCEPT<sup>1/</sup> to estimate the capital costs of Midland and its coal-fired alternatives. This program....

was designed primarily for identifying important elements in the cost structure, examining average cost trends, determining sensitivity to technical and economic factors and providing reasonable long-range projections of cost. Cost estimates produced by the CONCEPT code are not intended as substitutes for detailed engineering cost studies for specific projects, but it can be used and is frequently run to assess the overall plausibility of such studies.<sup>2/</sup>

The CONCEPT Computer runs produced capital cost estimates of about \$1.2 billion for Midland, and \$1.1 billion and \$1.2 billion for comparable size low and high sulfur coal plants, respectively. Recognizing that there is really no basis to conclude that CONCEPT estimates are more reliable than detailed engineering cost studies, and that the applicant's own estimates are, on balance, more favorable to the coal alternatives, the Staff has decided to use CP's capital cost estimates in this analysis. From Table 11.3 of the Environmental Report Supplement the 1981 capital cost present values are: Midland - \$1.670 billion; higher-sulfur coal - \$1.2655 billion and; low-sulfur coal - \$1.0616 billion. Assuming a 30 year plant life, 10 percent discount rate, and a 65 percent capacity factor for all alternatives produces annual levelized values of 19.2, 14.5 and 12.2 mills/KWh, respectively. These estimates are still more favorable to the coal option than the applicant's own levelized values because in levelizing, CP assumed a higher capacity factor for Midland and the low sulfur coal alternative (70%), a higher discount rate (11.75%), and a longer operating life (34 years).<sup>3/</sup> In addition, they have reduced the Midland capital cost by about \$400 million to reflect that portion already sunk due to construction to date.

Operating and Maintenance (O & M)

The Staff has relied on Oak Ridge's OMCST code for the levelized O & M cost estimates for Midland and the coal alternatives.<sup>4/</sup> This code utilizes

an extensive data base which takes into account historical experience and current trends to derive O & M cost functions by type and size of plant. The Staff believes this is preferable to the applicant's approach which relies primarily on the historical experience on their units. This is particularly true of the O & M estimate for Midland, as it is heavily dependent on the O & M expenses incurred on only one nuclear facility (Palisades).

The OMCST computer runs provided the Staff with 1984 O & M cost estimates for Midland and the coal alternatives. Assuming a 5 percent escalation rate, 65 percent capacity factor, 10 percent discount rate, and 30 year plant life, we estimate annual levelized costs of 2.6 mills/KWh for Midland, 2.6 mills/KWh for the low sulfur alternative, and 6.1 mills/KWh for the high sulfur coal plant. It should be noted that the high sulfur O & M estimate includes an incremental expense for SO<sub>2</sub> control.

#### Fuel Costs

The Staff's independent nuclear fuel cost estimate is 6.9 mills/ KWh in 1981. An explanation of the Staff's estimate appears in my testimony on "Cost of Replacement Power Resulting from Suspension" in this proceeding.<sup>5/</sup> Essentially, the Staff has assumed that nuclear fuel costs will escalate at 8 percent per year between 1975 and 1982, and at 5 percent thereafter. Based on this assumed escalation rate, a 10 percent discount rate, and a

an extensive data base which takes into account historical experience and current trends to derive O & M cost functions by type and size of plant. The Staff believes this is preferable to the applicant's approach which relies primarily on the historical experience on their units. This is particularly true of the O & M estimate for Midland, as it is heavily dependent on the O & M expenses incurred on only one nuclear facility (Palisades).

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30 year plant life, the levelized annual value is estimated at 11.8 mills/KWh.

The Staff's fuel estimates for the coal alternatives are based on the average delivered price paid by Michigan utilities in 1975 for low sulfur coal (sulfur content 1% or less), and high sulfur coal (sulfur content exceeding 2%).<sup>6/</sup> These prices were escalated at 5 percent per annum to obtain 1981 coal estimates of 12.5 mills/ Kwh (high sulfur) and 15.8 mills/Kwh (low sulfur). To each of these estimates the Staff has added 0.2 mills KWh for 1981 coal inventory costs. For the low sulfur alternative an incremental 1981 fuel cost of 0.6 mills/ KWh has been added due to estimated fuel requirements for particulate control, and to the high sulfur alternative, the 1981 incremental fuel cost is estimated at 1.8 mills/KWh for fuel required for particulate control and SO<sub>2</sub> control. These incremental fuel costs due to pollution control are taken from a 1975 report prepared for the Michigan Public Service Commission.<sup>7/</sup> Assuming a 30 year plant life, 10 percent discount rate, and a 5 percent escalation rate, the 30 year levelized values for the total coal fuel cost are 27.8 mills/KWh for low sulfur coal and 24.3 mills/KWh for high sulfur coal.

#### Taxes, Insurance and Decommissioning

The Staff has accepted the applicant's estimates of taxes, insurance, and decommissioning for Midland and the alternatives as reported in the Environmental Report Supplement, Table 11-3. It should be noted that

their nuclear insurance estimate overstates this cost item relative to the result reported in the OMCST computer run made for Midland<sup>8/</sup> and their decommissioning estimate is consistent with values provided by other utilities for the highest level of decommissioning (complete restoration of the site).<sup>9/</sup> The annual levelized values based on a 65 percent capacity factor, 5 percent escalation, 10 percent discount rate, and 30 year plant life are: Midland - 9.7 mills/KWh; low sulfur option - 5.9 mills/KWh and; high sulfur coal option - 7.0 mills/KWh.

#### Cost of Interim Power

The present construction schedule calls for Midland, Units 2 and 1, to come on-line on March 1, 1981 and March 1, 1982, respectively. Unit #2 would contribute 811 MWe to CP's capability and Unit #1 would make an additional 460 MWe available to the applicant's service area. Assuming a 65 percent capacity factor, these units would be capable of providing 3.85, 6.80, and 7.2 billion KWh in the calendar years 1981-1983, respectively.

If a coal alternative is selected over the Midland units, its in-service date is assumed to be January 1, 1984. This delay will force the applicant to rely on other sources of power during the 1981-1983 period to make-up the power that would have been provided by the Midland units during this time interval. The applicant has assumed that this power would be obtained from a combination of greater utilization of existing capacity and outside purchases resulting in a 1981 present value cost of \$661 million. The Staff has assumed that all the interim power will be

provided internally by coal and oil-fired units and that the only incremental cost associated with this energy will be the fuel charges. Assuming 5 percent per year escalation in the price of coal and oil, a 10 percent discount rate, and a 30 year plant life, produces a 30 levelized cost of 4.0 mills/KWh.

#### Conclusion

Table 1 summarizes and shows the Staff's conclusions regarding the cost comparison of Midland and the coal alternatives. The comparison has been presented in terms of a levelized annual cost over a 30 year operating life. The table shows a levelized cost advantage of about 12.6 mills/KWh and 9.2 mills/KWh by selecting Midland over the high sulfur and low sulfur options, respectively. It should be noted that the Staff has attempted to use conservatively high cost estimates for nuclear compared to coal, so that the cost differences shown are more likely to be too small than too large.

TABLE 1 - Economic Comparison of Energy Alternatives - 30 Year  
Levelized Costs in Mills per KWh

	<u>Midland 30 Year Levelized</u>	<u>High Sulfur Coal 30 Year Levelized</u>	<u>Low Sulfur Coal 30 Year Levelized</u>
CAPITAL COST	19.2	14.5	12.2
O & M	2.6	6.1	2.6
FUEL	11.8	24.3	27.8
TAXES, INSURANCE & DECOMMISSIONING	9.7	7.0	5.9
INTERIM POWER	-	4.0	4.0
TOTAL COST	<u>43.3</u>	<u>55.9</u>	<u>52.5</u>

Discount rate - 10 percent

Plant life - 30 years

Capacity factor - 65 percent

O & M cost based on OMCST

Escalation rate of 5 percent per annum to year 2011 except 8 percent per year  
for nuclear fuel between 1975 and 1982.

FOOTNOTES

1. CONCEPT: A computer code for Conceptual Cost Estimates of Steam-Electric Power Plants - Status Report, USAEC Report WASH-1180, April 1971.
2. Supplemental Testimony of Darrel A. Nash before the Atomic Safety and Licensing Board, Wolf Creek Generating Station, Unit No. 1, March, 1976, p. 3.
3. E.R. Supplement, October 26, 1976, Section 8 (revised).
4. A Procedure for Estimating Non-Fuel Operating and Maintenance Costs for Large Steam-Electric Power Plants, ERDA 76-37, October 1975.
5. NRC Staff Testimony of Sidney E. Feld on Cost of Replacement Power Resulting from Suspension, Midland Plant. Units 1 & 2. pp. 2-3.
6. FPC News, Vol. 9, No. 12, March 19, 1976, Table 3.
7. Environmental Protection Study, prepared for Michigan Public Service Commission, ICF, Incorporated, Washington, D.C., May 1975, pp. 57-58.
8. OMCST computed a 1981 present value for insurance of about 11.3 million dollars vs. applicant's estimate of about 53 million dollars
9. Supplemental Testimony of Darrel A. Nash, note 2 supra, p. 23.



The staff has determined that when the Midland units come on-line in 1981 and 1982, they will have the lowest production costs of any unit, with the exception of Palisades Nuclear and hydro capacity, within the applicant's system. It is therefore of some economic concern to the applicant and its customers to have Midland available as scheduled. Clearly, if the Midland units are delayed, Consumers Power Company (CP) must seek out alternative power sources to make up power that would have been forthcoming from the Midland units. Since it is logical to assume that the least cost units will be used to the maximum, independent of whether Midland is on-line or not, all alternative power sources available to the applicant will be more costly and will require the utility to incur incremental costs. The cost differential between producing the energy with Midland vs. the alternative constitutes the actual cost of the replacement power.

The selection of an alternative power source is not something one can readily predict. Logically, the utility will utilize the least expensive alternative available. However, what is available will depend on the demands existing on the system in 1981 and 1982. Seasonal patterns, as well as diurnal patterns of demand will affect this choice. Also, flexibilities in the utilities planned outages and maintenance checks may well alter the final selection. Depending on these factors, replacement power may be supplied by some combination of base, intermediate, and peaking units on the system, or thru outside purchases, or the creation of additional capacity.

For the sole purpose of our analysis of the cost of replacement power we conservatively assume little or no growth on the CP system. Consequently, the cost estimates developed herein are modest as they assume that the applicant will be able to make up the energy deficiency internally thru the utilization of existing capacity. It is further assumed that either coal or oil fired units will be available to make up the energy differences.

The cost of replacement power refers to the cost differential during that period of time between the presently scheduled availability of the Midland units and the date of availability that would occur as a result of the proposed suspension, the relevant time period is 1981-1982.

In 1981 and 1982, the nuclear fuel cost is estimated at 6.9 and 7.4 mills/kWh in 1981 and 1982 dollars respectively. These estimates are based on information previously presented in testimony at the Wolf Creek hearing.<sup>1</sup> Here, it was assumed that the nuclear fuel cost would escalate at 8% thru 1982 and at 5% thereafter. In this testimony the staff utilized a number of sources of information in preparing its nuclear fuel cycle cost estimate. The estimate considers the various fuel cycle components as identified by ERDA. The first step was to evaluate 1974 estimates of AEC and update these costs based upon latest available information. The source of these updates was to contact ERDA experts most closely associated with the various fuel cycle components together with experts in the private sector, particularly regarding U<sub>3</sub>O<sub>8</sub> price forecasts. The results of these efforts are reproduced below as Table.1.

In 1981 and 1982, the coal fuel cost is estimated at 12.4 and 13.0 mills/kWh respectively and for the same years the oil fuel cost is estimated at 28.0 and 29.4 mills/kWh. These values are also in 1981 and 1982 dollars.

These coal and oil estimates are derived from average prices paid for coal and oil for steam-electric plants in Michigan in 1975 as quoted in Table 13 of FPC News of March 19, 1976. The Staff has used a representative equivalent for 1 kWh of electricity of 10,000 BTU's of coal or oil. In addition, 1975 prices were escalated at 5% per annum (see Enclosure 1).

Thus, the average fuel differential between nuclear and coal is approximately 5.5 mills/kWh, and between nuclear and oil, it averages out at about 21.5 mills/kWh.

<sup>1</sup>Same as Source for Table 1.



These price differentials are then multiplied by the number of kWh's of nuclear generated electricity foregone due to the delay. Assuming a 65% capacity factor, the Midland units would have been capable of generating 0.6 billion kWh per month. Thus, if the energy is made up with coal units, the cost of replacement power would approximate 3.3 million dollars per month. If oil is the alternative, the cost of replacement power would approximate 13.0 million dollars per month.

Table 2 shows the cost of replacement power per month under different capacity factor assumptions and under different alternative fuel assumptions.

TABLE 1  
ESTIMATED NUCLEAR FUEL GENERATION COSTS  
(1982 DOLLARS)

Cost Component	Mills/kWh
Mining and Milling (\$40/lb of $U_3O_8$ )	2.33
Conversion to $UF_6$ (\$2.57/lb U)	0.12
Enrichment (\$128.50/kg SWU)	1.84
Fabrication (\$171/kg U)	0.66
Shipping and Reprocessing (\$249/kg U)	1.07
Pu Credit (\$26/g)	(0.66)
Waste Management	0.17
Subtotal	5.53
Carrying Charge (at 15%)	1.85
Total	7.38

Source: Supplemental Testimony of Darrel A. Nash before the Atomic Safety and Licensing Board, Wolf Creek Generation Station, Unit No. 1, March, 1976.

TABLE 2  
COST OF REPLACEMENT POWER PER MONTH

<u>CAPACITY FACTORS</u>	<u>COST OF REPLACEMENT POWER PER MONTH</u> <u>(in millions of dollars)</u>
Coal vs. Nuclear	
55%	2.8
65%	3.3
75%	3.8
Oil vs. Nuclear	
55%	11.0
65%	13.0
75%	15.0

Enclosure 1

Justification for a 5% Per Annum Escalation Rate for the Price of Coal

Several steps were taken to arrive at a 5% escalation rate for projecting the price of coal. These steps included:

A. A review of the current literature on the subject matter.

This included an examination of:

- (a) the National Energy Outlook-1976 prepared by the Federal Energy Administration,
- (b) A Study of Coal Prices prepared by the Executive Office of the President, Council on Wage and Price Stability, and
- (c) several other reports on fuel price projections prepared by, among others, Arthur D. Little, the Federal Power Commission, and the Environmental Protection Agency.

B. Collecting computerized pricing data on recent coal deliveries to every electric utility in the U.S. This data was obtained on a computer tape from the FPC.

C. Discussions with knowledgeable individuals in the field of fuel prices. This included discussions with representatives of FEA, FPC, Arthur D. Little, and Sobotka and Company.

In making this recommendation on projected coal prices, it is recognized that by simply escalating the 1975 price of coal, one ignores, to a degree many of the factors which might influence coal prices in the future. For example, there are several factors which would tend to lower the future price of coal. These factors include, among others, the availability of vast supplies of western coal and the relative ease of strip mining operations in the west. On the other hand, there are forces at work which could substantially increase the price of coal. These include the continuing labor difficulties and rising coal miner wages coupled with declining productivity. In addition, strip mine reclamation programs could add significant costs to the price of coal.

The staff's approach to projecting future coal prices would be based on the assumption that these factors would tend to cancel one another out and that the net effect would be that coal prices will increase at the nominal inflation rate of 5 percent per year.

Based on discussions with the parties identified in Item C above, the staff's approach to projecting coal prices may be conservative. FEA representatives stated that in their opinion, future prices of low-sulfur coal will escalate substantially over existing prices in real terms and that high-sulfur coal will probably escalate at the normal inflation rate. An FPC representative indicated that in real terms, coal prices can be expected to increase by 50 percent by the early to mid-1980's. When this 50 percent real increase is added to the 5 percent inflation rate assumed in the proposed treatment, this yields price increases ranging from 9.6 to 12.0 percent per year.

#### 5% Escalation for the Price of Oil

With respect to oil, staff believes that a 5% escalation rate is very conservative given the continued long-term outlook for a shortfall in supply of this fuel.

MR. CHERRY: Just to be on the safe side, can I just read the titles of the stipulated testimony?

NRG Staff Testimony of Sidney E. Feld on Issue of Midland v. Coal Alternatives, which comprises 7 pages, including footnotes. My stipulation will go to any corrections that are made.

And NRC Staff Testimony of Sidney E. Feld on Cost of Replacement Power Resulting from Suspension, which is approximately 3-1/2 pages.

CHAIRMAN COUZAL: Are those the same documents, Mr. Brenner?

MR. BRENNER: Yes, sir.

CHAIRMAN COUZAL: All right, they're received, and will be bound into the record as though read.

We'll take a break and --

MR. BRENNER: Maybe I'm wrong, Mr. Chairman, but my understanding of such a stipulation means that it does not necessarily go to some of the pre-foundation questions such as is the testimony true and correct to the best of the witness' knowledge, and so on. If I'm right, I'd just like to put that on the record right after the break.

MR. CHERRY: I'll stipulate that if asked he'll say he prepared it, or under his supervision, and he believes that's true and correct.

MR. BRENNER: That only takes one minute, and I

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think it's useful for the record.

CHAIRMAN COUFAL: All right, we'll do it that way, Mr. Brenner. I don't know what it gets us, but we'll do it.

MR. CHERRY: Well, it's procedure. That's how they run nuclear power. The procedure's okay, the substance isn't.

MR. REMFROW: Move to strike that.

CHAIRMAN COUFAL: All right, it's stricken.

(Recess.)

CHAIRMAN COUFAL: All right, are you ready to go, Mr. Brenner?

MR. BRENNER: Yes, sir.

DIRECT EXAMINATION

BY MR. BRENNER:

Q Dr. Feld, the documents that were identified by stipulation just before the break, were those prepared by you?

A Yes.

Q Do you have any changes to make to those documents?

A With respect to the Cost of Midland v. Coal Alternatives, I do have a few corrections.

Q Could you make them at this time, please?

A Yes.

On page 3, the sixth line up from the bottom of the first paragraph, the word "then" should be "than."

On page 7, fourth line down from the top, towards the end of the line, "...produces a 30..." the word "year" should be inserted, "...30 year levelized cost..."

MR. RENNROW: What page is that on?

THE WITNESS: Page 7, fourth line down, the end of that sentence.

And on page 8, I'd like to add a footnote to that table. The footnote would read:

This table assumes the following conservative assumptions:

(a) With respect to Midland, it assumes the total capital cost, rather than the "to-go" costs. And that's with respect to the capital cost component.

(b) Price of coal assumed to escalate at a nominal rate of 5 percent per year. And by that I mean essentially there is no real increase in the price of coal being forecasted over the 30-year life of the plant. We assume a five percent general inflation rate. There's no real increase.

(c) The cost of interim power assumes all the power can be made up by existing coal and oil fired units on the CP system. And by that I mean there is no assumption here that they'll have to go out and purchase power, which

constitutes the interim power, and it's levelized over 30 years, although the cost only occurs on a two-year period.

DR. LEEDS: Thank you.

THE WITNESS: Those are the only changes.

BY MR. BRENNER:

Q Do you have any changes to make in the other identified piece of testimony, cost of replacement power as a result of suspension?

A No, I don't.

Q As changed by you, are these two identified documents true and correct to the best of your knowledge and belief?

A Yes.

Q And you adopt it as your testimony in this proceeding?

A Yes.

MR. BRENNER: I take it that's it. They've already been bound in per stipulation.

I do have one brief question on direct.

BY MR. BRENNER:

Q Dr. Feld, with respect to your testimony on the cost of Midland v. coal alternative, on page 8 of that testimony, table 1, as noted on that table you there have comparative costs expressed as 30-year levelized costs in mills per kilowatt hour.



Could you also express the total cost column for each alternative in terms of 1981 present worth costs in millions of dollars?

end 10  
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A Yes; that information appears in the DES on page 5-3, Table 5.1; presenting the same data in a present worth, present value, 1981. Midland Nuclear would be \$3.616 billion. The high sulfur coal would be \$4.951 billion, and the low sulfur coal would be \$4.549 billion .

Q The document that you refer to as the DES, Dr. Feld, the source of that identified table, is that the Draft Supplement to the Final Environmental Statement related to construction of Midland plant, Units 1 and 2, dated January 1977, and also denoted as KUREG 0157?

A Yes, it is.

MR. BRENNER: That's all I have.

Dr. Feld is available for cross-examination on these two pieces of testimony.

CHAIRMAN COUFAL: Mr. Nute?

MR. NUTE: I have no questions.

CHAIRMAN COUFAL: Mr. Renfrow?

MR. RENFROW: Thank you.

#### CROSS-EXAMINATION

BY MR. RENFROW:

Q Would you turn to page 5 of your testimony on cost of cost of Midland versus coal alternatives, the first full paragraph there. I direct your attention to the low sulfur coal that you identify as a sulfur content of one percent or less?

arb2

A Yes.

Q Do you know what EPA identifies as low sulfur coal?

A I have known the figure but I can't place the sulfur content right now.

Q Is it less than one percent?

A I am not sure what the EPA assigns as what constitutes low sulfur coal for environmental purposes. I can explain the basis for using these particular numbers and that was in discussions with Consumers Power, I asked them specifically what they were viewing as low sulfur coal, for the low sulfur coal alternative, and they identified a sulfur content of one percent or less.

With respect to high sulfur coal, it was sulfur content that exceeded two percent.

Q Now, this was their 1975, I take it, identifications?

A No; those pieces of information were extracted for this hearing within the last month or two. The 1975 fuel cost estimates were obtained from the Federal Power Commission listings that employed this information.

Q I want to go back to the one percent sulfur content. The question I was specifically asking you was that was identified as 1975 low sulfur coal, would be sulfur content of one percent or less, is the question I am asking you.

Is that how it was identified to you?

arb3  
A To the best of my recollection, that was not the way it was identified to me. I had asked them when they were talking about low sulfur alternative, what was the sulfur content. By alternative, I mean the alternative to the plant at Midland.

Q Have you looked at whether or not the EPA requirement for low sulfur coal in terms of SO2 per million btu is actually less than one percent sulfur content in coal?

MR. CHERRY: Objection. Asked and answered.

CHAIRMAN COUFAL: Overruled.

THE WITNESS: I don't know that number, what the sulfur content is that the EPA is calling for as meeting the standards.

BY MR. RENFROW:

Q If it was less than one percent, would it change your cost estimates?

MR. BRENNER: Could I get that question --

CHAIRMAN COUFAL: If it was less than one percent, would it change your cost estimate?

MR. BRENNER: Thank you.

THE WITNESS: Yes; I suspect it would.

BY MR. RENFROW:

Q Would you turn to your testimony on cost replacement power resulting from suspension, please?

And turn to page two of that testimony. I refer

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you to the second paragraph at the bottom referring to Table 13 of the FPC News, March 19, 1976.

Do you have that?

A. Yes.

Q. Can you describe for us what that table contains?

A. Yes.

Well, there are several tables in that report.

Q. I am referring now only to the coal table. Leave the oil alone.

A. Let me see if I can go back and pull it out.

(Pause.)

Table from the FPC News -- unfortunately, the table isn't identified. I am going to assume for the moment that it is Table 13.

It provides the breakdown of the costs of coal deliveries and these are delivery prices to utilities, to steam electric plants by state. And it breaks the coal deliveries down by .5 percent sulfur or less. And there are varying ranges for sulfur content. And then there is an average price for all purchases coal and it expresses the cost in cents per million btu.

Q. Do those delivered -- are those delivered prices, prices delivered under contract?

A. My understanding is that it is a combination of both spot and delivered.

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Q Can you tell me what the percentage of contract versus spot deliveries in the table?

A I don't believe I can, no. I believe that there are other tables in the FPC files that do break it down by that.

Q If they are, these contracts, -- excuse me:

If those tables were weighted in favor of contracts for the delivery price of coal, what would that do to the average price, which is stated in the table?

A I think, given the present spot prices, it would probably increase it.

Q Would increase the price of coal stated as the average?

A Yes.

Q Can you tell me the basis for your belief that it would increase it?

A Well, I am not 100 percent certain on this but my understanding is that the spot market right now is depressed that the price of coal is perhaps falling.

Q Can you tell me, define for me what a spot purchase is, as opposed to a contract purchase?

A I think it is if someone wants to go out right now a utility, let's say, and purchase coal and they are given a quote for a given quantity as opposed to a contract which would extend over -- one would be committed to providing coal

over an extended period of time, I would say.

Q Have you investigated as to what the price is as of this date for long-term contract of coal?

A No, I believe this table identifies an average for all deliveries. I guess that is as far as I would be able to discuss.

Q Some of those would be long-term contracts for years price of coal, being delivered under them?

A Yes.

Q Let me take you to page five of your testimony.

CHAIRMAN COUFAL: Which testimony?

MR. RENNOR: The same one, Mr. Chairman. I will stay with this even though some of the information is in the other one and just ask one set of questions on it.

BY MR. RENNOR:

Q Now, Dr. Feld, the 5 percent escalation rate, if we are projecting the price of coal which you refer to in the first sentence of that, would you describe that 5 percent escalation rate for me, tell me what, exactly what you mean by that.

A That is a nominal increase. So if one assumes inflation of 5 percent it seems that there is no increase in the price of coal.

Q And I take it from this enclosure I that you believe that is a conservative assumption?

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A Yes.

I guess if I were to explain a little bit further, the Staff reviewed many reports on that forecasted coal prices. And we received -- I suspect that there is a fairly wide range that one could look upon as being an expected or a possible price increase for coal.

But I think the five percent nominal increase represents the lower end of this range. And it was adopted for conservation.

Q Let's start with the National Energy Outlook, 1976 prepared by the FEA. You referred to that in your previous testimony.

Can you tell me what they predicted for increase in coal prices?

A I think so.

(Pause.)

The notes I have indicate that the FEA results show estimated 1985 prices to East North Central Region, of \$2.15 per million btu for low sulfur, and \$.65 per million btu for high sulfur.

Q What did they say about the escalation rate of the coal?

A If you accept those forecasts, we are talking about increases of less than five percent.

Q What does the study of coal prices prepared by the



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Executive Office of the President's Council on Wage and Price Stability say with regard to the escalation rate for coal?

A. That, too, shows a real decline in the price, and that is a price quoted for Chicago between -- well, it shows a real decline in the price to Chicago between 1975 and 1980.

Q. What about after '80.

A. My notes do not indicate if they have forecasted beyond 1980. I think I have an excerpt of that in my --

Q. And your notes, while you are looking for that, maybe you save -- your notes on the National Energy Outlook of 1976 show what happens beyond 1985?

A. I don't believe they forecast beyond that, '80. I am sure they have not.

(Pause.)

The figures I quoted you for the Council on Wage and Price Stability are for 1985.

Q. That is as far as they go?

A. Yes.

Q. Fine.

Now will you turn to page 6 of your testimony, that first -- I guess the second full paragraph starting, "Based on discussions with parties identified in Item C above...", you have a quote there from an FEA representative:

"Future prices of low sulfur coal will escalate substantially over existing prices in real

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terms...."

Did you ask them about that statement in terms of their statements in the National Energy Outlook, that there would be a decline?

A Well, my understanding was, was that this was in conversation with an individual with FEA as opposed to the FEA's National Energy Outlook Study which incorporated many people's inputs.

DR. LEEDS: Did you say:

My understanding was, was that it was a conversation with --

THE WITNESS: Yes.

DR. LEEDS: You didn't have the conversation?

THE WITNESS: No. The analysis for the forecast of coal prices was initiated by the branch of which I am a member.

DR. LEEDS: Excuse me for interrupting. I just wanted to be sure I heard it correctly.

BY MR. RENFROW:

Q You had started to say something when you were cut off.

A Yes.

This particular comment by a representative of the FEA is not something that, you know, is overly alarming. We have many additional studies that we looked at which

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suggest that the future price of coal will increase at substantially a faster rate than 5 percent nominal rate.

And we have estimates that probably go up to 7, 10 percent in real terms, which would mean compared to what we are talking about maybe 15 percent real -- actual increase in the price of coal; 10 percent of it being real.

Q Do you know when this conversation with the PER representative took place?

A It appears in a memo dated June 4, 1976 -- it was in 1976.

Q Do you know whether it was before or after the National Energy Outlook, 1976 was published?

A I don't know.

Q What did the Arthur D. Little study say about the escalation rate for the price of coal?

DR. LEEDS: Mr. Renfrow, could we get that identified. It just says the Arthur D. Little study. Can you be more specific?

MR. RENFROW: I am sorry. I am now on 2C of your enclosure 1.

BY MR. RENFROW:

Q Would you identify the author of the Arthur D. Little study?

A It is entitled, "Economic Comparison of Base Load Generational Alternatives for New England Electric,"

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March 1975.

Q Can you tell me what that report stated about escalation rate for coal in the future?

A Yes. They are assuming a 7.3 percent real increase. If we assume inflation of 5 percent, that would be a nominal increase of 12.3 percent. That is per year.

Q What about one -- can you identify the Federal Power Commission report that you talk about?

A I believe that is entitled, "The Adequacy of Electric Power Fuel Supplies in 1975 to 1985, a paper presented at the 38th Annual Meeting of the American Power Conference, Chicago, April 20, 1976. The notes I have on this paper indicate that they are estimating a 2.5 percent per annum real price increase.

Again, if you were to assume 5 percent inflation, they are talking about a 7.5 percent.

Q Let me take you back to page 6 now, and your comment about the FPC representative there in the second full paragraph.

Can you identify when that information was obtained?

A If I was able to locate that memo, -- I believe it is a memo that has been introduced into the record. It was used by Mr. Sims -- I could then give you the date but I don't think I have it with me for some reason.

I don't know what the date is. I don't remember.

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Q Did you have that conversation with the FPC representative?

A I did not have that conversation.

Q Was it the same representative who gave the paper?

A I don't believe so.

Q Do you know why there is a difference in the FPC paper and the FPC representative's coal prices increases?

A This FPC paper was prepared by five members of the FPC staff. It could reflect their personal feelings, not necessarily those of the Federal Power Commission nor necessarily does this FPC representative represent a formal FPC position.

Q What is the formal FPC position?

A I am not aware of one.

Q What about the Environmental Protection Agency? Can you identify the report that you looked at for them?

A This was an EPA contract done by Sobetha Company, and that was prepared in February of 1978. I am having difficulty locating the price increase.

(Pause.)

My problem is I have long-run forecasts presented in 1978 dollars, but they don't identify what the year is. I don't know if I am going to be able to help you on that one.

Q All right.

What other reports did you look at besides the ones

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A The Governor's Advisory Commission on Electric Power Alternatives has a forecast for the price of coal in real terms of between 7 and 12 percent per annum down to 1985. That would correspond to between 12 and 17 percent, relative to the 5 percent.

Q Can you tell us what Governor's Advisory Commission you are speaking of?

A On electric power alternatives, 1976 report, and those estimates are here in Appendix 3, page 40.

Q What state?

A The date?

Q What state?

A It is for the State of Michigan.

Q What other reports did you look at?

A I also performed a -- this is very -- yes; using the FPC News and looking at their price for 1975 and their price for 1976, to the State of Michigan there was a 12.2 percent increase in the average price. That compares to a 3.9 percent increase nationally.

Q That 12.2 percent is real?

A You would have to deduct out inflation.

Q So, just to keep the record straight in terms of real, it would be 12.2 minus inflation for that period; is that correct?

A Right.

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Q Are there any other reports that you looked at?

A There was an Arizona study entitled, "Price and Availability of Western Coal," in the Midwestern Utility market, 1974 to 1982. It was prepared by Ashury and Gosselin. They forecast a price increase for coal to Detroit, Michigan between 1974 and 1982 of 3.3 percent per annum. That is a real increase. We assume five percent inflation and we are talking about 3.3 percent.

Q Any other reports that you look at?

A Those are the ones that I have references to at this time.

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Q Are there any others that you remember?

A No, there are no others that I remember.

Q Based upon what you reviewed in terms of long-term prices for coal, you have an escalation rate for coal prices, including nominal escalation, of between 5 percent and 17 percent based on all the studies that you've looked at, is that correct? We'll leave out the EPA study.

A I think there were a couple of studies that identified absolute real declines in the real price of coal. More precisely, it would be something less than 5 percent to 17 percent.

Q That would be the study of coal prices by the Executive Office of the President?

A Yes.

Q Do you remember what that decline was?

A It's sort of open-ended. It says between 1975 and the 1980s a real decline in price of between 8 and 24 percent.

I want to make it clear there is a likelihood of an increase in price going on with respect to coal, but it's something less than inflation; so in real terms it's a decline.

Q So it would still be increased, but it would not increase as fast as the inflation rate, whatever that was?

A Exactly.

Q You took a nominal increase of 5 percent, so if we



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took 8 percent of that we'd have somewhere about the increase that the Executive Office of the President on Wage and Price Stability tells us that we're going to pay for coal, something in that range, is that right?

A. No.

You're saying that the Council on Wage and Price Control's forecast might be around 9 percent?

Q. No, I'm saying that if you took -- if your escalation rates were correct, and we'll take that as a given, 5 percent, we'd have to increase the amount for coal by 5 percent per year; but then we'd have to decrease that 5 percent by somewhere between 8 and 24 percent, and we'd get the number the Office of the Executive, whoever those fellows are at the President's office, are telling us, is that right?

A. Yes, but you'd have to make an assumption as to what number of years that 8 to 24 percent corresponds to.

Q. Okay. But it goes from whatever that number comes out to be and 17 percent, is that right?

A. Yes.

Q. That's your range?

A. Yes.

Q. Considering your second full paragraph, where you talk about factors which will increase and factors which will decrease the price of coal, did you consider in reaching this the cost of transportation?

blt 3

A We've considered it -- well, let me back up a second.

The forecast -- the price that we're starting from in 1975 is a delivered price, so in that sense transportation in 1975 is reflected.

The analysis assumes 5 percent escalation for coal, 5 percent escalation for transportation costs. If I were to have to identify factors that might make this forecast too low, as others have done, the transportation component seems to be the one that would suggest that there would be something greater than 5 percent.

I don't know if this is appropriate, but to try to clarify the Wage and Price Stability report, maybe these numbers might be of help to you. This is delivered low-sulfur coal prices in cents per million BTUs.

Chicago, Illinois, as of October 1975, the current price was 96 cents per million BTU; the forecasted price for the 1980s, which is again vague, 73 to 83 cents in 1975 prices.

Q All right.

Now, are those, once again, based on contracts that were in existence at the time?

A I do not know.

Q Have you looked -- well, let me ask you this question first before we go to that.

bit 4

You talked in Section B. of collected computerized pricing data on recent coal deliveries. Can you describe for us what that data is?

Again, I'd like to correct an impression that has arisen a couple of times.

This analysis was prepared by people at the NRC, not by myself.

MR. RENFROW: Excuse me, Mr. Chairman. I've got another conversation going.

MR. BRENNER: Mr. Chairman, excuse me. Mr. Cherry just walked over and removed the Intervenor's Exhibit 49 which Dr. Leeds had this morning. I was in the process of having somebody copy it so I could return it to Dr. Leeds.

MR. CHERRY: Mr. Chairman, this is my copy of the exhibit. I will duplicate it and mail copies around to everybody. I don't want them losing my only copy.

MR. BRENNER: Could I borrow it for 15 minutes so I could have it photocopied and added to my exhibits file?

CHAIRMAN COURSE: Why don't you let him take it out and have it copied, Mr. Cherry, and bring it back?

MR. CHERRY: Mr. Feld has the other copy. Why doesn't he get it from Mr. Feld?

CHAIRMAN COURSE: I don't know who's got the other copy. Is it all that important?

MR. CHERRY: Well, no, I suppose it isn't important.

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It's just that it was taken from my table and not returned. I wasn't told about it, and I don't like it.

CHAIRMAN COWFAL: If that's happened, you're admonished, whoever took it from Mr. Cherry's table, not to take it from his table.

MR. BRENNER: This is ridiculous. Dr. Leeds knows what has happened. He had a copy; he lent it to me; I promised I would have it copied and returned. We're endeavoring to make good that promise.

Nobody took any of Mr. Cherry's toys.

CHAIRMAN COWFAL: It's all straightened out.

Now, go ahead and ask your question, Mr. Renfrow.

DR. LEEDS: I think it is on the record how it got transmitted around.

MR. BRENNER: I agree, Dr. Leeds. I'm certainly sorry this interruption was caused by somebody who apparently isn't sorry.

BY MR. RENFROW:

Q. Let's go back and start over.

You started to tell me about a misconception.

A. Yes. The Enclosure I on the cost of replacement power resulting from suspension is a description of a review and the sources that were used by people within the Cost-Benefit Analysis Branch to reach a decision regarding what would be a conservative, non-controversial estimate of

bit 6

escalation for the price of coal, and these procedures were employed in that analysis.

I myself did not partake in that analysis, although I have reviewed -- I have tried to review as many of the reports that they've identified in the literature.

Q Have you reviewed the computerized pricing data that they got from the computer take from the FPC?

A No, I have not.

Q Have you made your own analysis of what a realistic projection for the price of coal will be in the future?

A To the best of my knowledge, based on items that I've reviewed, I feel that a reasonable price increase of between 5 and 10 percent would be in order. That would include inflation, so we're talking about a real increase of perhaps zero to 5 percent.

Q Can you tell me what you base that analysis on?

MR. CHERRY: Objection. Asked and answered.

CHAIRMAN COOPER: Overruled.

THE WITNESS: I base that on the documents that I have reviewed and we have just been identifying.

BY MR. JENKINS:

Q These are reports that you and I just discussed and the results from them? It does not include the computer take that you haven't seen yet, is that correct?

A Correct.

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Q. What about subsection C., "Discussions with knowledgeable individuals in the field of fuel prices"?

Did you have any discussions with them before reaching this conclusion?

A. I've just been able to review what their comments have been.

Q. Okay.

I want to be sure the record is clear, Dr. Feld. The FEA comments are the ones that are listed over here on page 3, which you and I have already discussed. Is that correct?

A. Yes.

Q. The FPC comments are also the ones that are shown over here on page 3, too, that we have already discussed?

A. Yes.

Q. What about the Arthur D. Little discussions? Did you have any discussions with a representative of Arthur D. Little?

A. I did not personally, no.

Q. Did you have any discussions with a representative of Sobotta?

A. No.

Q. What did the representative of Arthur D. Little -- excuse me. I'll have to go back and ask another question.

In reaching your decision as to your increase of

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between 5 and 10 percent, did you review the memorandum of discussion with a representative of Arthur D. Little?

A No. I reviewed the Arthur D. Little report.

Q Okay.

I don't want to confuse you, but I'm now down on

C.

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Q Did you review a memorandum of discussion with Jobotka and Company?

A No.

Q Other than the factors which you have listed which will lower the price of future coal, the availability of vast supplies of western coal and the relative ease of strip mining operations, what are the factors that you consider would lower the price of coal?

A I think that pretty much covers it. I think the gist of what I was trying to convey is the supply, the potential future supply, which would have a constraining effect on prices.

Q All right.

What are the factors did you consider which would increase the price of coal besides labor difficulties, rising wages, declines in productivity and strip mine reclamation?

A I really can't identify any specific additional items. I guess in my own mind I fall into the problem

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that all of this is rather subjective, how one takes these factors and weights them and comes up with a final forecast.

I think the Staff's position as presented here was to assume they would balance each other out, to not try to support a higher price for the future, higher prices for coal, which might be construed as, you know, that we're trying to support them.

Q I appreciate that. You've taken the low end of coal costs, which is 5 percent; and there's only one study you've looked at which projects a lower number, is that right?

A I believe that there are two studies that I've identified that have actual real declines in the price of coal.

One was the study from the Council of Wage and Price Stability.

Q I'm sorry. If you have, correct me. I thought that was the only one that showed a decline. The rest of them were rising.

A The FEA results, which are for the east-northcentral region, show real declines in the price of coal.

Q What are those real declines?

A \$1.15 per million BTU for low-sulfur for 1985 and 65 cents per million BTU for high-sulfur in 1985.

Q How does that compare with today's prices, based on your studies? How are we going to relate that to decline



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in prices?

A All right.

These are expressed in 1975 prices. The prices that are reported in the Federal Power Commission for low-sulfur and high-sulfur coal are on the order of 90 to \$1 for high- and low-sulfur.

Q What did the Federal Energy Administration use for their current prices, so that we can compare what they used with what they say is going to happen?

A All right.

(Witness reading.)

They don't -- based on the excerpts that I have pulled out here, there's no indication of what the 1975 base price was.

Q You remember, though, that it was a decline? Is that what you're saying? Or you assume it's a decline because of your review of the FPC data?

A I believe it was identified as a decline in the report itself.

MR. CHERRY: Mr. Renfrow, do you have considerable more?

MR. RENFROW: No.

BY MR. RENFROW:

Q You don't have that with you, I take it? Do you remember whether it was more of a decline than the 8 to 24

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percent identified by the other Government agency, or was it in the same range?

A Well, based on the estimates that I've seen for 1975 prices, it would appear as if the low-sulfur coal would have to be a very, very minor decline, if a decline at all; but the high-sulfur coal, we're talking about maybe a 10 cents per million BTU decline, and that would be in real terms.

Q We've got that range, up to 17 percent, is that right?

A Right.

Q And you picked a 5 percent number.

Do you know whether or not the Staff has done any analysis that looks at such things specifically as reclamation, transportation, labor costs as specific components of the future price of coal?

A My understanding is that the Staff doesn't look at that. It relies on studies of others that have looked at them.

Q I want to go back to the base price for a second and get off the escalation.

Your FPC index which you used is weighted in terms of long-term contracts. As I understand what you've done in your testimony, you would take the price of coal that you could buy today in the long-term contract, and then according to your testimony to get a conservative number you

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would then escalate that price by 5 percent. Is that correct?

A. I don't believe that's correct.

Q. Okay.

A. The numbers I used represent the average prices for this coal of specific sulfur content with the average price of all coal composite, and whatever the combination of contracts and spots that exist in 1975 would be assumed to remain, to hold for 1982 up to 30 years.

Q. And you would escalate them at 5 percent a year?

A. Right.

Q. So that if that base number was either low or high, you would have to adjust it and then, as I understand it, escalate it 5 percent a year?

A. Right.

Q. Are you aware -- who in your section is in charge of coal, actually doing the coal analysis?

A. Two gentlemen -- I guess three people that I know are involved in it. Two of them are no longer in the section, although they're in other parts of the NRC.

One was a Dr. Paul Fire; the second was a Regis Boyer.

Q. They're no longer in your section anymore?

A. Right, but I believe Daryl Nash, who is in the section still, had input to this.

Q. Did you review all of that material and their

blt 13

findings before you wrote this testimony?

A. No, I reviewed those reports after I wrote the testimony. I accepted the analysis that was prepared by the Cost-Benefit Analysis Branch.

Q. Do you know when they prepared that?

A. My impression is it was sometime in 1976. It was something that was prepared prior to the Midland case being identified as an area where it might be applied.

Q. Can you give me a season -- summer or spring?

A. There is a memo floating around on it which would have the exact date.

Q. If you could just give me an approximate time, that would be satisfactory.

A. Perhaps May. I could be off on the date.

Q. So you don't know?

A. I have a memo here from Paul Fine on the subject which is dated June 4, 1976, and my recollection is that this was part of the process that resulted in the final memo.

Q. Have you reviewed any of the tables from the EPC News since March 19, 1976, and compared the price with that which is quoted on March 19?

A. The March 19th data, I think, produced the final results for 1975. It provided the average price for the entire year, and I used that particular starting point because of seasonal variations in the price. I wanted to get

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the average for the year.

As I mentioned earlier, I have looked at data through June of '76, which appeared to have -- I would speculate that as a 2- to 3-months lag, so we're talking about maybe September or October of '76, EPC News.

And based on a comparison between the June '76 results and the June '75 results, I observed a 12.3 percent change in the price of coal in Michigan.

Q But you haven't looked at it since June, any of the data since June?

A No.

Q And that 12.3 is a 12.3 percent increase which includes inflation or to which you have to add inflation?

A It includes inflation.

MR. REMFROW: I don't have any further questions, Mr. Chairman.

CHAIRMAN COUFAL: Mr. Cherry?

BY MR. CHERRY:

Q In your nuclear fuel costs, did you assume there would be plutonium recycling at some point?

A Yes.

Q What year?

A I believe it's in 1985.

Q What is the present status of plutonium recycling before the Nuclear Regulatory Commission?

bit 15

A. I don't know what the position is before the Nuclear Regulatory Commission. My understanding is that ERDA is the agency that has lead responsibility there and that it is still being funded.

Q. Still being funded?

A. Yes.

Q. Is there a decision which permits recycling of plutonium right now by any federal agency?

A. I don't know that, if there is or not.

Q. Is it going on right now?

A. No, it's not.

Q. Is it possible it will never occur?

A. It certainly is possible.

Q. Do you have any information that will lead you to believe it's more likely than not that plutonium recycling will occur?

A. I have no reason to conclude that, nor the opposite of that.

Q. Then why did you put it in your testimony as part of the cost?

A. It's something that is being budgeted for. There is research for it. I believe in all the analyses that I have reviewed that have identified nuclear fuel costs for the Staff it is a component that is considered.

Q. Would the absence of consideration of plutonium

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recycling increase your nuclear fuel cost?

A Yes.

Q By how much?

A Approximately 10 percent.

Q 10 percent per year?

A 10 percent on the levelized mills per kilowatt-hour basis.

Q Over how many years?

A Well, on a levelized or annualized basis. That takes care of the differences in the price per year.

Q I know. But what's the span?

Are you talking over the life of the Midland Plant?

A Yes, that's what the levelized figure is.

Q What would that do to the comparisons of coal and nuclear if the nuclear cost were raised in percent?

A It would increase your nuclear fuel cost approximately 13 mills per kilowatt-hour and therefore raise the total cost to 44.5 mills per kilowatt-hour.

Q How about reprocessing? Have you assumed that?

A That's embedded in the plutonium recycle.

MR. CHERRY: Mr. Chairman, I don't have any further questions of this witness. I have a couple of motions to make about his testimony.

CHAIRMAN COOPER: Dr. Leeds has a couple of questions.

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## EXAMINATION BY THE BOARD

BY DR. NEEDS:

Q Dr. Feld, would you try to explain to me, in stages if necessary, what is the difference between a real price increase and an inflation rate of 5 percent? Can't I pay more if the inflation goes up by 5 percent? Isn't that a real price increase?

A Well, if you assume a perfect economy where all prices are increasing and add a general inflation rate, and included in that is your salary and wages, then if your wages go up 5 percent and all prices go up 5 percent you're just as well off as you were before. So we say that there is no real increase in the price; you're just keeping even.

It's only when the price of a particular commodity increases at a faster rate than inflation that we can identify that as a real price increase.

Q Well, I guess my problem is this: How do you identify a 5 percent inflation rate, in the first place? What goes into that calculation?

A Well, given the fact that two years ago we experienced double-digit inflation, it's obviously not, you know, assigning values to the inflation rate is also something that's subject to a lot of uncertainty.

Q Excuse me. My concern was not with the actual numerical value; it was with what you mean by X-percent



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inflation rate.

A It's assuming that all prices and wages and so forth are going to increase at 5 percent per year.

CHAIRMAN COUFAL: Excuse me.

Will the parties stipulate that I can step out of the room a minute while Dr. Leeds is asking his questions?

MR. CHERRY: What if we don't?

CHAIRMAN COUFAL: I suppose I'll stay here and my head will be stuffed up worse than it is.

MR. CHERRY: Of course I'll stipulate it.

MR. BRENNER: So will I.

MR. RENFROW: Certainly.

MR. NUTE: Yes, sir.

CHAIRMAN COUFAL: Thank you, gentlemen.

(Chairman Coufal leaving courtroom.)

BY DR. LEEDS:

Q So all prices go up by X-percent uniformly?

A It never really is uniformly. We use price indexes. We use a consumer price index or a wholesale price index. That is supposed to be a representative package of goods and services that the consumer is concerned with, and the wholesale index would be what industry is concerned with.

If that experiences a 5 percent increase, then we usually assign that as a general inflation rate.

Q Would it make sense to look at the general inflation

t 19

rate for fuel and then compute coal versus that rather than just the 5 percent number?

A. No, because we're concerned with the price of fuel relative to all other goods, not just the price of fuel in and of itself.

To get a measure of relative value, it has to be in the context of something broader than just the prices for that.

Q. When you consider the coal alternative -- it may be in your testimony, but I didn't see anything in there where Dow was split off. It was assumed to be part of the plant and not a separate plant.

A. You're talking about the coal alternatives? The coal alternatives addressed here are 1600-megawatt coal units that are capable of generating 1600 megawatts of electricity, and the assumption, underlying assumption, is that the prices of generating electricity and of steam are essentially equal.

End 12

Q What's the basis for that assumption?

A The basis for that assumption is a determination that with respect to capital cost, first of all, we could identify approximately a 20 million dollar reduction in the price of the coal alternative if we had looked at steam and electric combined. Whereas there would be an innumerable number of potential increases in the capital costs if we had looked at steam and electricity as opposed.

So that we feel that, you know, if anything, with respect to the capital costs, we are understating the costs with respect to capital costs.

With respect to the O&M, fuel, there is the assumption which -- the assumption that it takes a certain amount of coal to produce a kilowatt hour of electricity, versus a unit of steam.

Q I guess my point is this:

You have not looked at a -- you said -- you haven't looked at a 500 and 800 combined coal plant, and then something to provide Dow with the other 300 megawatts equivalent thereof? Is that correct?

A Yes. And one of the reasons why, and this is again a general statement, all the alternatives that I've become aware of since this hearing has started all single out coal as the fuel that would provide it. In looking at two 800-megawatt plants, we feel that we have looked at the

wel 2

least cost coal alternative available.

If we were to begin to talk about smaller sized coal plants, plus Dow going along with coal, given the economies of scale and everything else it's our general feeling that those cost estimates would be higher.

Q Have you examined Dow's estimated cost?

A In a very preliminary fashion.

Q Does it confirm what you just told me?

A In a very preliminary fashion, yes.

Q Does the CONCEPT computer runs include interest during construction?

A Yes, they do.

Q It does?

A Yes.

Q It gives a capital estimate of \$1.2 billion, and the estimate for the Midland plant is \$1.67. Do you have any explanation for why it's off by -- if I didn't miscalculate -- something like 40 percent, or 35 percent?

A Yes. I did get into discussions with the people who run that program at Oak Ridge, and they identified two potential areas of discrepancy.

First of all, the computer program for nuclear capital costs is somewhat old, and there have been certain -- I think it dates from 1973 -- and certain structural requirements have changed since then which aren't incorporated

in the code, more stringent safety controls, and so forth, which would have an added cost effect.

A second item that was identified to me as an important factor that would cause this differential is Consumers Power has been identified as using considerably higher contingency allowances than CONCEPT typically provides for.

And the third item would be the fact that the CONCEPT code is looking at a 1600 megawatt nuclear single purpose plant in the Michigan area for 1982. It doesn't have the capability of looking at dual purpose costs.

Q Is the \$200 million that they included in table 9.4-1 of their ER out of line?

A I'm sorry, in the ER?

Q Yes. They list as contingency allowance \$205 million in Table 9.4-1 of the ER.

MR. RENNISON: Would you identify that for us, Dr. Leeds?

DR. LEEDS: Table 9.4-1 of the ER. And this is cost information for nuclear power generation method, which, I gather, is the present estimate, is it not?

THE WITNESS: I don't have my ER.

MR. BREWER: I'll bring it to you, Dr. Feld.

BY DR. LEEDS:

Q If you add the two bottom line numbers, it comes

wel 4

up to \$1.67 billion, which I assume is the number.

Did you find it yet, Dr. Feld?

A Yes, I did. And it's identified as \$205 million.

Q Okay.

A And your question was is that too high?

Q Too high.

A It's a higher estimate than CONCEPT uses. That doesn't necessarily make it too high.

Q What does CONCEPT use?

A (Pause) Well, unfortunately, the CONCEPT code has a different breakdown of costs, so I can't get the comparable figure. The programmer at Oak Ridge identified that as the differential, and I didn't pursue it further because it suggested that if it was too high, it would be a conservatism on the part of Consumers Power.

Q Did you compare the amount of contingency allowance here for this one, versus the coal plant that they used?

A (Pause.)

Q Did you compare; not will you compare.

A No. I did not.

Q Okay. Would you mind looking -- it's on the next page. Does that seem reasonable? \$34 million out of \$1.3 billion?

A I have identified a contingency allowance under

in the code, more stringent safety controls, and so forth, which would have an added cost effect.

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MR. BRENNER: I'll bring it to you, Dr. Feld.

BY DR. LEEDS:

Q If you add the two bottom line numbers, it comes

wel 5

direct costs under the CONCEPT run, and it's \$53 million for the coal alternative, for the low-sulfur coal alternative for both units, and \$59 million for the high-sulfur coal alternative. And the corresponding figure for Midland is \$35 million for both units.

Q So they're comparable to CONCEPT on coal?

A They're comparative with respect to coal.

Q Would you look at another big item on the nuclear table 9.1-1? There's \$400 million for interest during construction. How does that compare with CONCEPT?

A Allowance for interest is \$368 million under CONCEPT.

Q What's the rate?

A 3.5 percent, simple.

DR. LEEDS: I have no more questions.

CHAIRMAN COUFAL: Is there any cross on Dr. Leeds' questions? Any redirect, Mr. Brenner?

MR. BRENNER: Yes, just very brief, Mr. Chairman.

#### REDIRECT EXAMINATION

BY MR. BRENNER:

Q Dr. Feld, in response to Mr. Cherry's request that you assume reprocessing doesn't occur, you've indicated a change to the tabulation in your table 1 on page 8, and your cost of Midland v. coal alternatives, which numbers are in the 30-year levelized cost in mills per kilowatt hour.



wel 6

As part of your original direct testimony, that is, prior to cross, we had added total cost numbers in terms of 1981 present worth cost in millions of dollars.

Can you indicate what the difference would be in that number if you follow the assumptions Mr. Cherry asked you to make through on that number?

A Under the Midland nuclear, the fuel costs would become \$1,116 millions of dollars. And the total would, therefore, become \$3,917 millions of dollars.

Q That's still in 1981 present worth?

A Yes.

MR. BRENNER: That's all I have.

MR. CHERRY: Mr. Chairman, I have one information-  
al question I want to ask of Dr. Feld. May I?

CHAIRMAN COUTAL: Yes.

RECROSS-EXAMINATION

BY MR. CHERRY:

Q Do your nuclear costs include a factor for waste disposal?

A Yes.

Q And what is that factor?

A In 1982 dollars, for the first year, 1982, .17 mills per kilowatt hour.

Q And what kind of a waste disposal system are you assuming will be available in order to justify that cost?

wel 7

A That's based on ERDA preliminary computer runs, and I may have something additional on that, but it's recognized that it's not an on-going thing at the time. But ERDA has analyzed it, and based on their analysis they've come up with this estimate.

Q But you are aware that there is no solution for radioactive waste disposal which is currently accepted by any agency as a realistic solution?

A I am aware that there is no accepted -- nothing that has been accepted by the Agency as the way to proceed.

Q Do you know if the method that ERDA suggested would be the accepted method now or any time in the future?

A I have no way of knowing.

Q Well, then, isn't it true that you don't really know what the cost of waste disposal would be?

A I have an estimate based on what ERDA believes would be the most logical way to proceed with waste management.

Q That problem is not resolved, and you cannot, therefore, have a figure which accurately reflects the cost of resolution, because they don't know what it's going to be.

MR. BRENNER: Mr. Chairman, I object to that as argumentative, in form at least. I think Dr. Feld answered the same question when it was phrased in a non-objectionable form just before.

This has been an on-going controversy by way of

a legal matter. Also in terms of interpretation of NEPA, and at least one context of GESMO. And cost estimates have been made without identifying the specific way, technically, that waste would be disposed of.

I think that question has been asked and answered. I know Mr. Cherry is trying to make the argument along those lines that --

CHAIRMAN COUFAL: I agree that this is a little bit argumentative, but go ahead and answer it.

Can you recall that question?

BY MR. CHERRY:

Q We cannot have a reliable figure for nuclear waste disposal that we can use to justify any cost analysis, because we don't know what the disposal would be; isn't that correct?

A I would say that it would certainly add some additional uncertainty to that number.

Q Would you agree with what I said, that we don't have a reliable figure for waste disposal because we don't know how we're going to deal with it? Would you agree with that?

A I can agree, yes.

Q And would you agree with me that waste disposal is a critical element in examining the cost of fuel, or do you think it doesn't matter?

MR. RENFROW: Well, I think this is beyond the scope of this. We're back in waste disposal. What the Commission is supposed to do under the generic rule, and -- I waited until it got this far, but I think this whole line of questions are beyond what this Board has been called upon to investigate.

CHAIRMAN COUFAL: Overruled.

THE WITNESS: I think your question was: Wouldn't this greatly alter --

BY MR. CHERRY:

Q No. My question was: Is waste disposal, in your judgment, a critical element in analyzing nuclear fuel costs?

A No. Because the estimate that I have identified for waste disposal component is one of the smallest of the cost components of --

Q We're getting mixed up, Dr. Feld. We've got a series of questions. My first question I asked, and you agreed with me, that because we don't know what the waste disposal resolution is, we cannot have a realistic figure to factor in to the cost-benefit analysis, and you said that you agreed with me.

My next question is, in the broad, do you consider that the real value of waste disposal when we finally got a thing, is a hard and important and critical factor in analyzing nuclear fuel costs and making comparisons with

other fuel costs?

MR. BRENNER: Mr. Chairman, I object to the first part of the question, at least, as re-stating Mr. Cherry's views of that on-going legal argument that is required under NEPA with respect to realistic figures and reasonable figures, and so on.

If Mr. Cherry wants to state the testimony more accurately, I would have less objection.

CHAIRMAN COUFAL: Well, I agree there's pretty soon going to come a limit to this, but you may answer that question, Mr. Feld. Or if you disagree with the premise involved in that question, you may state it.

THE WITNESS: If I could express it in my own words, I would agree that there's probably a greater level of uncertainty associated with the waste disposal cost component than many of the other elements that are factored in there.

But I would say that analyses have been performed by ERDA to try and estimate this cost, recognizing that there is uncertainty there. And the estimate that they come up with is a relatively low number.

Now, they can be off by two, three, four, five times and the amount that that's going to influence the total nuclear fuel cost is not going to be as significant as, for example, other components.

wel 11

BY MR. CHERRY:

Q What if they're off by a billion times?

A If they're off by a billion times, it would have a dramatic effect.

Q Well, Dr. Fold, isn't one of the ways in which we have to at least today consider the disposal of radioactive waste, is to bury it for its lifetime, with guards and so forth? And have you ever computed what it would cost in present worth dollars to put a guard on three shifts, one guard for each of three shifts, until the half lives of all the stuff that's generated is finally dissipated? Have you ever computed that figure?

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A I have --

MR. RENFROW: I am going to have to repeat my same objection, Mr. Chairman. We really are far down this path.

CHAIRMAN COUFAL: I think we have gone far enough.

MR. CHERRY: You are barring me from making inquiry into this subject based on --

CHAIRMAN COUFAL: It has gone further than --

MR. CHERRY: Do you have something, Dr. Luebke?

DR. LUEBKE: I was just trying to get the procedures straight. I thought that the cross-examination had completed some time ago.

MR. CHERRY: Are you annoyed that I am getting into this area, Dr. Luebke?

DR. LUEBKE: No. I am just talking about hearing prediate that.

I just want to state, Mr. Chairman, that I appreciate that you may be bound by the Commission's ruling with respect to nuclear fuel costs. But I think that that presents a major problem of my being able to do anything in this hearing.

And I would specifically ask you once again to consider the fact that one of the fundamental bases of the Aeschliman decision was that licensing had to consider the back-end of the fuel cycle, reprocessing and waste disposal. Those are major uncertainties.

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And therefore, you can only assume that the nuclear fuel costs are a meaningless figure. And it just simply is not fair, whether it helps nuclear power or hurts nuclear power, or whatever, to spend in a proceeding now where we have gone on now for several weeks, on the magical assumption that because a particular matter is unresolved that the Commission won't let it happen.

And I must say that I think it is behooved and incumbent upon you, sir, Mr. Chairman, who have taken an oath of office, to discharge this responsibility to take that issue up with the Commission in some way.

Because I do not believe it is fair. I know you are bound by some constraints. But there is an old rule that says if a judge doesn't have jurisdiction, then he is a janitor. And if the Nuclear Regulatory Commission is that far out of line in connection with the Aeschliman decision, then you don't have to follow that rule.

The only other thing I would like, Dr. Feld, is my Exhibit 49 back which is --

MR. BRENNER: I will take care of that, Mr. Cherry, and not Dr. Feld. I would like to respond to that comment, also.

CHAIRMAN COUFAL: Mr. Rendrow has something to say.

MR. BRENNER: Mr. Chairman, could you direct



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Mr. Cherry to get away from my witness?

CHAIRMAN COUFAL: Mr. Cherry, don't carry on a conversation while Mr. Brenner is trying to talk.

MR. CHERRY: I don't want to listen to him.

CHAIRMAN COUFAL: I want to listen to him and I can't hear him when there are two or three conversations going.

MR. BRENNER: Would you ask him to return to the other side of the room and away from my witness?

MR. COUFAL: No, I won't do that.

Just go ahead and make your statement.

Mr. Cherry, be quiet while he is making his statement.

MR. BRENNER: I will satisfy Mr. Cherry on the first point; I have a copy of Exhibit 49 which Dr. Leeds loaned to me, which I appreciate, Dr. Leeds.

Apparently Mr. Cherry feels terribly obligated to get it back at this moment. I will return it to you and there it is, sir.

MR. CHERRY: That's not the one I want. I want the official marked copy that is in the possession of Dr. Feld.

MR. BRENNER: Can we go off the record, Mr. Chairman.

CHAIRMAN COUFAL: Let's not go off the record, let's stay on the record.

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MR. BRENNER: This is ridiculous. This is the marked copy that the reporter passed to Dr. Leeds, which --

MR. CHERRY: That is not true.

MR. BRENNER: Which Dr. Leeds --

MR. CHERRY: Dr. Feld said he had it in his briefcase.

MR. BRENNER: Dr. Feld has his own copy, I believe. This is one of the two copies that you turned in, Mr. Cherry. I don't see why I have to put up with it.

CHAIRMAN COUFAL: You don't.

Go ahead and address what ever else you wanted to.

MR. BRENNER: I did make a copy for Dr. Leeds and for the Board's use. I will return that.

(Handing document to Board.)

I don't know what to do with this copy which Mr. Cherry no longer wants. Since, Dr. Leeds was kind enough to loan it to me I will pass the headache on to him by returning that copy, too.

(Handing document to Board.)

MR. BRENNER: Perhaps you will get further than I got with it.

Returning to the substance of this proceeding and away from the games:

Mr. Cherry's statement with respect to the Board's being constrained and in turn the constraint up him with

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respect to the Commission's implementatio of the Aeschliman decision, it is confused. I don't know if it is purposely confused or not. It is similar to statements he has made several times. I would like to try to straighten out the confusion very briefly without going into all aspects.

The Commission's interim implementation of the Aeschliman decision indicates the individual Licensing Boards, including the Board in this proceeding, would not make an independent inquiry into the environmental effects as connotated in the rule of Part 51 and which is currently undergoing interim procedures as an interim prelude to final procedures.

That decision, both now and in fact prior to the Aeschliman decision at the time the rule was still considered valid and in effect never barred inquiry in individual proceedings as to the cost bases for the estimates of nuclear costs for use in cost-benefit analysis at times, in comparison with coal costs.

To the extent some of those costs depend upon nuclear fuel costs and in turn on fuel cycle costs, again, economic costs; they are open for inquiry. They have been open for inquiry in any individual proceedings. They have been open for inquiry in this proceeding. They were in the direct testimony filed in this proceeding. They were the subject of cross-examination.

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The one narrow ruling to which Mr. Cherry responded with a very broad complaint where he was getting far afield in arguing the ongoing question of if you don't -- if you have not at this time picked a specific method of waste disposal, can you nevertheless assign a cost to that component.

I believe that the Board did allow questions in that area and finally cut it off when it got too far afield. That in no way barred inquiry into the fuel costs estimates presented in this proceeding, which was obviously open for inquiry, as the Board and as Mr. Cherry knows.

I think that the confusion engendered by his constant complaints is misplaced. And I appreciate this opportunity to respond to it.

CHAIRMAN COUFAL: Okay.

We have ruled.

Is there anything further?

MR. CHERRY: Dr. Feld has returned to me the original copy of Exhibit 49. I appreciate that.

I have no further questions of Dr. Feld, although I do want it noted for the record that I have had to conclude my examination on nuclear fuel costs without having ever seen information which Consumers Power Company claimed proprietary, which has been the subject of a pending ruling for some time now.

And I don't know whether or not I would have had

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And I don't know whether or not I would have had

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more questions because I haven't seen that information.

I just want the record to show that my cross-examination has been concluded without even having seen that information that I asked for from Consumers Power Company in December of 1976.

That elaborate procedure whereby they demanded indexing, and privilege and reconsideration, et cetera; the upshot of it was, all that testimony went in and I didn't get to see the information.

I am not stating that I would or would not have had any questions because I haven't seen the material.

But I think it is a hell of a way to run an army.

MR. RENFROW: I will just point out for the record for anybody that wants it; if you look at the request, it had nothing to do with computer runs. It had to do with contracts. And that was the only request that was made until we got to this proceeding.

MR. CHERRY: That is incorrect. I made a request off the indexes that were provided to me and I checked them off, and it was on the basis of those responses to the indexes checked off which were sent to me in December that they claimed privilege and turned them over to the Board.

And I made a request by going over, checking off those index parts --

MR. RENFROW: Just refer to the record. It is very

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clear which parts he is talking about. The ones he is speaking to are the ones he refused to accept from me this morning and not the other parts. On that I will be quiet because I think the record is very clear on what he requested and what he got.

CHAIRMAN COUFAL: All right, Dr. Feld. I guess nobody wants you any more.

You are excused.

(Witness excused.)

DR. LEEDS: I am going to hand the reporter the copy of Midland Intervenor's Exhibit 49.

MR. RENFROW: Dr. Leeds, I don't have a copy of that. If nobody wants it, I would certainly appreciate it and I can just add it to my stack.

DR. LEEDS: Sir, I am going to hand it to the reporter so that she may have it for the record in this hearing. And if you want to get a copy of it, you can make an arrangement with the reporter.

(Handing document to reporter.)

That is the copy that Mr. Brenner gave to me a few minutes ago, if I remember.

CHAIRMAN COUFAL: All right.

Now, how about Mr. Meltz, Mr. Brenner?

MR. BRENNER: We checked at lunchtime. He is ill. He said he was feeling worse today than the other days. If

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we are finished with everything else, the chances of his being here tomorrow are very, very low.

Had we continued with other business, what we were going to do was call him late tonight and again first thing in the morning.

MR. CHERRY: Mr. Chairman, I have a motion to make.

I will move --

CHAIRMAN SCUFAL: Concerning Mr. Meltz?

MR. CHERRY: Yes.

I will move that the Board exclude the testimony, Meltz testimony, or the alternative: I will agree that the Meltz testimony go in now as if sworn to, as if read, right into the record.

And I have no cross-examination. And I am led to believe based upon prior conduct, that Dow Chemical has no cross-examination and would agree to my stipulation because they wouldn't do anything to make anybody believe they are in a corner there.

So that is two out of the three parties, since the Regulatory Staff can't object to that, since I am waiving swearing, waiving signing, waiving everything.

And if Mr. Fenrow has any questions, I would suggest he do them by interrogatory. If he does not, then the record is closed.



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CHAIRMAN COUFAL: That sounds like a good suggestion, that it be stipulated in.

Mr. Renfrow?

MR. RENFROW: I can do that provided -- I think I have one interrogatory question I may have ask Mr. Meltz about. But I would be glad to do it by interrogatory in hopes of getting this proceeding over with.

CHAIRMAN COUFAL: All right.

We will receive the testimony of --

MR. CHERRY: I will identify --

MR. BRENNER: I will take care of it.

MR. RENFROW: Does the Board have any questions?

MR. CHERRY: It is NRC --

MR. BRENNER: Mr. Chairman, I will --

MR. CHERRY: Excuse me. I would like to identify what I just stipulated.

It is entitled, "NRC Testimony of Arnold H. Meltz on the Financial Cost of Delay (Excluding Replacement Power), and I will also stipulate as if read Mr. Meltz' professional qualifications which is the 7th page.

MR. BRENNER: Mr. Chairman?

MR. CHERRY: That is the document to which I had reference in stipulation.

I have serious reservations about Mr. Meltz' qualifications and what he says in his testimony, but I

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believe I can make those points at some point on the basis of the testimony as is now in the record.

CHAIRMAN COUFAL: As I understand it, it is stipulated that the Melts' testimony which Mr. Cherry read the title of, is to be received and bound into the record as if read.

And further, that if Mr. Melts were asked to testify, he would swear that the testimony is true and correct to the best of his knowledge as of this time.

MR. BRENNER: There is one other matter, Mr. Chairman. We also prefiled one page entitled corrections to the testimony of Arnold H. Melts bearing the caption of this proceeding to save time as to oral corrections.

CHAIRMAN COUFAL: Is that stipulated in, too, Mr. Cherry and Mr. Renfrow and Mr. Nute?

MR. CHERRY: If I could see a copy for just a moment, I think I will.

CHAIRMAN COUFAL: Do you have a copy there that the parties can see, Mr. Brenner.

MR. BRENNER: Yes, sir. I have no problem in giving my copy to other parties.

(Distributing copies.)

MR. CHERRY: Yes; I will include this sheet in my stipulation.

MR. BRENNER: Mr. Cherry -- We have no problems

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with this procedure.

Mr. Chairman, I would add that Mr. Cherry's gratuitous comments about his serious reservation are just a total non sequiter as far as the proceeding is concerned because I would for the sake of the record like to make the offer we were going to make, had Mr. Cherry not said he wanted to do this instead.

And that offer was; we are going to be back here sometime the week of March 7th with some possible adjustments depending on Dr. Timm's availability which the Board, I assume, is pursuing or is going to pursue. And we would have had Mr. Meltz here at that time, or any other time, even prior to that time, convenient to the Board and the parties subject to his having recovered.

So I don't want the record to reflect that the Staff in any way suggested a procedure which denied Mr. Cherry his right to pursue his vague and unsupported musings as to Mr. Meltz' qualifications and the substance of his testimony.

MR. CHERRY: Well, just so that they won't be vague; all I was referring to was the standard that was apparently used to prepare all the Staff testimony and that is; find a document of Consumers Power Company and copy it and that is what Mr. Meltz did. He found Exhibit 3 to the Keeley testimony and then he proceeds to tell us what he thinks Mr. Keeley meant.

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1 And when I talk about professional qualifications,  
2 I am talking about a professional person who comes to a pro-  
3 ceeding and is willing to stake his reputation and his job  
4 and everything else on the basis of what somebody else did,  
5 particularly when it is a utility.

6 And when I talk about professional, I am talking  
7 about, I don't have any respect to that kind of a person.

8 CHAIRMAN COUFAL: That argument will be stricken.

9 You can make any argument you want to after  
10 awhile, Mr. Cherry, and what weight should be given to the  
11 Meltz testimony or based on --

12 MR. BRENNER: The argument is complete misplaced.

13 CHAIRMAN COUFAL: -- based on his qua ifications,  
14 Mr. Cherry, and based on what he says in the testimony.

15 MR. BRENNER: I would make it clear that the  
16 opportunity to voir dire -- he has got the opportunity to  
17 voir dire. He has got the opportunity to cross. If he  
18 thinks about it and changes his mind, we will have Mr. Meltz  
19 here.

20 And I don't want the record to be confused as to --

21 CHAIRMAN COUFAL: You have made your offer to  
22 have Mr. Meltz here. We appreciate it, Mr. Brenner. Every-  
23 body has stipulated that that is not necessary.

24 MR. BRENNER: I would add that if the Board on  
25 reflection desires to have Mr. Meltz for any purpose, of

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1 course, we will do that, also.

2 CHAIRMAN COUFAL: Thank you.

3 MR. BRENNER: I will return copies into the  
4 reporter so that the three identified documents with respect  
5 to Mr. Meltz' testimony may be bound into evidence in the  
6 transcript as if read.

7 (Documents follow .)

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ARNOLD H. MELTZ

PROFESIONAL QUALIFICATIONS

I am currently the Senior Financial Analyst at the U. S. Nuclear Regulatory Commission and am responsible for coordinating all financial qualifications review activities during the licensing process. In this regard, I plan and direct the staff financial evaluation of specific facility applications. These evaluations include a review of estimated construction costs or operating expenses, projected financing methods and underlying assumptions, regulatory trends, and money and capital market developments. I have also served as an expert witness in certain safety hearings before the Atomic Safety and Licensing Board when financial qualifications was a contested issue.

I was graduated from Boston University in 1965 with a B.S.B.A. in Finance and received an M.B.A. in Finance in 1966 and a J.D. in Law in 1969 from the University of California at Berkeley. I am a member of Beta Gamma Sigma, the national business administration honorary society, the New York Bar, and the American Bar Association and its Section of Public Utility Law.

Prior to joining the Nuclear Regulatory Commission in December 1974, I spent over two years with the New York Public Service Commission as a financial analyst in the Utility Finance Section of the Office of Accounting and Utility Finance. My responsibilities in this position included preparing testimony and exhibits in the cost of capital and rate of return areas and serving as an expert witness on these subjects in rate proceedings. I have testified in cases dealing with electric, gas, telephone, and water companies. My duties also involved making recommendations to the Commission on the suitability of utilities' financing petitions after an analysis of their financial condition, construction program, and ability to raise short and long-term capital.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

CONSUMERS POWER COMPANY

(Midland Plant, Units 1 and 2)

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Docket Nos. 50-329  
50-330

NRC STAFF TESTIMONY OF ARNOLD H. MELTZ  
ON THE FINANCIAL COSTS OF DELAY (EXCLUDING REPLACEMENT POWER)

Gilbert S. Keeley, the Project Manager for Consumers Power Company's Midland nuclear plant, filed an affidavit dated October 22, 1976 (Affidavit of Gilbert S. Keeley on Behalf of Consumers Power Company) in support of "Response of Consumers Power Company" to the October 13, 1976 letter of the Commission. A portion of this affidavit deals with the delay costs associated with suspending construction for five months and nine months. Attached as Exhibit 3 to this affidavit is a comparison of the current budget, broken down into major cost components, with those which would result from a construction suspension for the periods mentioned. According to the data shown in Exhibit 3, the current budget for the Midland nuclear plant is \$1.67 billion and a nine-month suspension in construction will boost the total plant cost to \$1.92 billion, an increase of \$250 million. As shown, these figures do not include nuclear fuel costs. The purpose of this testimony is to provide an explanation of what the \$250 million consists of, how it was arrived at, and how one might assess its magnitude.

Exhibit 3 indicates that about \$120 million, or almost half of the projected increase, is attributable to the allowance for funds used during construction (AFUDC). According to the Federal Power Commission's Uniform System of Accounts, AFUDC includes "the net cost for the period of construction of borrowed funds used for construction purposes and a reasonable rate on other funds when so used." Therefore, AFUDC is equivalent to the cost of capital used over the period of construction: interest charges paid on debt, dividends paid on preferred stock, and a fair return on the common equity. Although these costs are properly includible in the electric plant accounts as a cost of construction, ratepayers normally do not provide revenues to cover these costs until the construction is complete and the plant goes into commercial operation. Since construction work-in-progress is not generally considered "used and useful in the public service," it is not allowed into the utility's rate base for rate setting purposes. This means that Consumers Power Company and most other electric utilities with large construction programs expend sizeable amounts of money on which they receive no cash return until the "used and useful" test is satisfied. Over the period of construction, the costs associated with construction activities, including AFUDC are capitalized on the books of the utility as part of construction work-in-progress. An off-setting credit is then made on the income statement under "Other Income." The dollar amount of AFUDC to be capitalized is computed by multiplying the weighted average



cost of capital, called the AFUDC rate, by the average construction work-in-progress. Therefore, the longer a project is in the construction work-in-progress stage and the higher the dollar value of that construction work-in-progress, the more AFUDC will be capitalized and the higher the amount which will eventually go into the rate base. This is essentially the explanation for the increased AFUDC of \$120 million. Consumers Power has already invested about \$400 million (see Exhibit 2 to Keeley Affidavit), and this amount will cumulate for an additional year or more at an AFUDC rate of 8.5% because of a nine-month suspension in construction. In addition, increased AFUDC will result because of a large amount of miscellaneous shutdown and startup expenses directly related to the suspension. Finally, the inflationary impact of the suspension on the remaining construction expenditures will also cause additional AFUDC to be recorded. The significant point to keep in mind with respect to AFUDC, however, is that the incremental amount resulting from a construction suspension will not necessarily involve an out-of-pocket expense borne by Consumers Power. Its economic impact will be felt primarily by the Company's ratepayers in the form of a higher price per kWh once the plant goes into operation. Up until that time, the incremental AFUDC is little more than an accounting procedure. This contrasts sharply with most of the other incremental costs resulting from a suspension, which will require the Company to actually expend more dollars over the balance of the construction period. This analysis does not consider the possibility that additional

securities will have to be issued to help finance the larger construction program or the somewhat more subtle point that financing costs may increase somewhat over the period of construction because of the presence of more non-cash AFUDC in reported earnings.

The suspension in construction for nine months will cause Bechtel's balance of plant costs to increase by almost \$47 million due to escalation alone. The escalation rate being used by Bechtel is 7% for the period beginning January 1, 1977. Even assuming a more favorable inflationary environment in the future than experienced in the recent past, such a rate appears reasonable when compared with the average annual increase of approximately 11% over the five years ended 1975 in the Handy-Whitman Construction Cost Index for the electric, light, and power industry. Aside from the \$8 million increase in Bechtel's contingency allowances, the remaining incremental costs, as shown on Exhibit 3, consist of various miscellaneous items, most of which can probably be attributed, either directly or indirectly, to shutdown and startup activities.

At the request of the NRC staff, Consumers Power Company submitted data presenting estimated annual expenditures under the present budget and with a nine-month suspension, both including and excluding AFUDC, as follows:

(Annual Expenditures in Millions)

<u>Date</u>	<u>Present Budget With AFUDC</u>	<u>Present Budget Without AFUDC</u>	<u>9-Month Suspen- sion With AFUDC</u>	<u>9-Month Suspen- sion Without AFUDC</u>
Thru 1976	\$ 430	\$ 368	\$ 430	\$ 368
1977	245	202	175	138
1978	310	248	278	226
1979	299	219	341	269
1980	220	127	268	177
1981	126	72	238	134
1982	40	32	147	67
1983	--	--	42	18
1984	--	--	1	1
Total	\$1,670	\$1,268	\$1,920	\$1,398

Since the dollars being expended by the Company occur over a number of years, one can get an improved perspective on the incremental costs of delay if the estimated annual expenditures under the present budget and with a nine-month suspension are discounted to present worth. In this way, future dollars can be converted into equivalent 1976 dollars. As previously mentioned, the incremental amount of AFUDC occasioned by a suspension will not necessarily result in more dollars being expended by the Company over the balance of the construction period. Consequently, I chose to discount the estimated annual expenditures excluding AFUDC

to isolate the impact a suspension will have on the Company's cash outflow. The Company's present plan shows total expenditures after 1976 of \$900 million, excluding AFUDC, and with a nine-month suspension, the total increases to \$1,030 million, or a difference of \$130 million. If these projected annual expenditures are discounted to present worth at a 10% rate, reflecting an assumed opportunity cost of capital, the expenditures come to \$703 million under the present plan and \$765 million with a nine-month suspension, or a difference of \$62 million. One should also consider that a portion of these projected expenditures represent contingency allowances and will therefore not necessarily result in cash expenditures.

However one might view the incremental costs of delay, it is apparent that they will be substantial. Although the increased financial burden will fall most directly on the Company over the period of construction, the Company's ratepayers will feel the impact for many years after the plant goes into commercial operation.

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NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of  
CONSUMERS POWER COMPANY  
(Midland Plant, Units 1 and 2)

}  
Docket Nos. 50-329  
50-330  
}

CORRECTIONS TO THE TESTIMONY OF ARNOLD H. MELTZ

The following corrections should be made in the written testimony of Arnold H. Meltz filed in this proceeding on November 5, 1976.

1. In line 15 on page 2, after the period, add "Alternatively, some state regulatory commissions, Michigan being one, include construction work-in-progress in the rate base but, at the same time, credit AFUDC to operating income for rate-setting purposes. Such a procedure is likely to produce substantially the same end result."
2. In line 18 on page 2, delete "until the 'used and useful' test is 'satisfied.'" and substitute "for many years."
3. In line 5 on page 3, delete "will eventually go into the rate base." and substitute "ratepayers will be required to support."

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(Board conferring.)

CHAIRMAN COUFAL: Mr. Cherry?

MR. CHERRY: Could we just record now that the Regulatory Staff's direct case is completed?

CHAIRMAN COUFAL: It is concluded subject to the opportunity that everybody else has by March 1st or what ever that day was, February 28th, to provide with good cause shown -- and I don't know that they have anything that they feel is necessary to their case -- showing why it wasn't filed prior to being in the proceeding.

MR. CHERRY: But that's rebuttal testimony.

CHAIRMAN COUFAL: No; that is additional direct and they haven't offered any; with regard to Consumers, that was additional direct and rebuttal. We will offer you and the Staff the same possibility.

MR. BRENNER: So that the record is crystal clear, in reliance on the Board's ruling last week, we followed that ruling and we will file any proposed supplemental direct and any proposed rebuttal by that February 28th date.

I would like to have a chance after the other arguments are finished, to come back to a minor point on our rebuttal part, but reliance on that, we are pursuing the schedule.

Had the Board not come up with that schedule, we were actively pursuing other possible testimony and would have

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filed it prior to that, if allowed, or if the Board had desired to hear it prior to that time.

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CHAIRMAN COUFAL: Mr. Cherry?

MR. CHERRY: I would just like to make one very brief motion. I won't argue it, but I would now like to move for a suspension at the conclusion of the direct case of the Regulatory Staff on the grounds, in addition to the ones that I've set forth before, that it is clear that the Regulatory Staff has not made an independent study of any of the critical parameters, that any studies that they seem to have made appear to be kind of fogging around, indicating there is more to be looked at in a remanded hearing.

I think if the Regulatory Staff is to be judged -- and maybe I'm wrong -- by a standard of doing an independent review, clearly they haven't done it. I believe now that I should be entitled to an order immediately granting suspension.

CHAIRMAN COUFAL: Okay, you've made your motion. I'm grateful you didn't argue it.

Mr. Brenner, we don't need any argument on that.

MR. BRENNER: I wanted to say this in response --

CHAIRMAN COUFAL: Don't get into an argument. He made a motion. He stated the grounds for his motion. I don't want to hear argument about it.

MR. BRENNER: Simply, I think the testimony on its face and on the basis of cross-examination completely refutes that argument.



blt 2

CHAIRMAN COUFAL: It wasn't an argument. It was a motion.

You're arguing, Mr. Brenner.

MR. BRENNER: It completely refutes the underlying basis which he advances in support of that motion, if you will.

CHAIRMAN COUFAL: All right, fine. Thank you.

Mr. Cherry, are you telling us that you are not going to provide Dr. Timm?

MR. CHERRY: Well, I'll repeat what I said this morning.

As of today I do not have sufficient funds to continue on in the case. My funding has been cut off some weeks now, and I have outstanding --

CHAIRMAN COUFAL: I understand your position.

MR. CHERRY: I had made a personal judgment that I'd stay here for the conclusion of the Staff's testimony between now and the 9th of March, which is the earliest, between the Board and Dr. Timm, it's at all possible for him to testify in view of his schedule and your recesses.

I intend to see if I can gather some funds. I intend to spend two days doing that.

CHAIRMAN COUFAL: Okay.

MR. CHERRY: If by the close of business Friday I have not been able to gather funds, then I will be

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permanently out of this case.

Dr. Timm has informed me as of noon today that he does not wish to respond to a Board request unless some accommodation can be made of the fact that it's going to cost him to come here.

CHAIRMAN COUFAL: What I want to do, Mr. Cherry, is tell you my problem.

MR. CHERRY: Okay.

CHAIRMAN COUFAL: It always gets left "iffy." You're going to know by Friday; you're going to know by Tuesday; you're going to know some time. I understand that's a problem for you.

Now, I feel that as long as it stays "iffy," then this Board has no power to do what you think it ought to do, because it would just be a subterfuge. It would be financing your case, which, as you know, we're not permitted to do.

Now, you say you're going to know by Friday?

MR. CHERRY: I appreciate what you've said. I think you can now operate under the assumption, Mr. Chairman, that I do not have the funds available. I said I'd make some calls on it because I'd really like to see what I can do, but I have called over eleven foundations and I cannot get any money.

CHAIRMAN COUFAL: All right. You let us know by Monday morning. You're going to make some calls by Friday

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and give us something by Monday morning as to where you stand.

MR. CHERRY: Okay.

CHAIRMAN COUFAL: If you then state that he's yours, or maybe he's yours, or possibly he's yours, then it's your problem.

If you state then that it's impossible for you to fund him or whatever, then we will look at it and see if we want to try to figure out some way to get him here.

MR. CHERRY: Okay.

Would an earlier date than Monday be better for the Board?

DR. LEEDS: Friday would be better, because Monday happens to be a Federal holiday.

MR. CHERRY: I'll do it on Friday, because that's the date on which I'm going to cut off inquiry. I'm not going to spend my life doing it.

CHAIRMAN COUFAL: If you will do it by Friday --

MR. CHERRY: I'll do it by Friday.

DR. LEEDS: Let's make it Friday.

CHAIRMAN COUFAL: You may call for me if you want to do it by telephone. I've got a bad cold. I may be -- I don't know where. If I'm not available, call Dr. Lubke, if you will.

MR. CHERRY: Very well.

CHAIRMAN COUFAL: I guarantee you Dr. Luebke will not be sick, because as Chairman of the Board I won't permit it.

(Laughter.)

DR. LEEDS: I would prefer, Mr. Cherry, just to make sure that everything is all squared away and everybody hears about it, and to save the problem of telephones and all that kind of stuff, after you call Dr. Luebke and Mr. Coufal if you would just send us a letter confirming one way or the other whatever the result is.

MR. CHERRY: I will.

CHAIRMAN COUFAL: And a copy to the parties.

DR. LEEDS: A copy to all the parties. Then everybody will know and there can be no argument over what the translation was.

MR. CHERRY: Very well.

CHAIRMAN COUFAL: All right. Thank you.

With that, we will be adjourned until the week that begins the 7th of March.

Let me say this: Whether Dr. Timm gets here or doesn't get here, if we admit any of this testimony that's coming in, let's go. I mean, if Dr. Timm is not here and Mr. Cherry is not here, we're going to start and go, go, go.

So don't come in that week and say, "You know, my people are in Africa because we thought Dr. Timm was going to

blt 6

be here." We want to finish and get done.

MR. CHERRY: There is -- and I'll let you know this on Friday as well -- but I have a case which is scheduled for oral argument before the Court of Appeals in the First Circuit on the 8th of March.

CHAIRMAN COUFAL: It's in the transcript from yesterday. I'm aware of that.

MR. CHERRY: Are you telling me now that if I can get funds and proceed forward that the hearing is still going to go forward on the 7th?

CHAIRMAN COUFAL: No, I'm not telling you that, Mr. Cherry.

MR. CHERRY: Okay. I'll let you know on Friday whether I'll be in as well.

CHAIRMAN COUFAL: Yes, Mr. Brenner.

MR. BRENNER: I'm sorry. I realize the hour is a little late.

CHAIRMAN COUFAL: That's all right. I'm a little crotchety today because I've got a cold that's killing me, but you've all been through that this week. All of you who live in Chicago must suffer with that all the time.

MR. BRENNER: I'd like to be able to order my witnesses not to get sick, also. Maybe you will tell me the secret.

CHAIRMAN COUFAL: You just order them.

b1t 7

MR. BRENNER: With respect to the Board's ruling on the filing of supplemental direct and rebuttal testimony by February 20th, I started to express this problem earlier and it was probably a bad time in view of other matters. I'd like to try to address it briefly today.

The normal procedure is that rebuttal is filed after the cross-examination.

CHAIRMAN COUTAL: We've been through this, Mr. Brenner. We've talked about this, and we've said if you've got a problem --

MR. BRENNER: I certainly don't want to risk a strategic problem by having a lack of substance in this record, which is the Staff's role and also the Board's role; so I am going to go ahead, and in addition to preparing cross-examination of Dr. Timm we're going to at the same time prepare rebuttal of Dr. Timm to try to accommodate the Board, or we have to accommodate the Board so long as the ruling stands.

My problem is, not surprisingly, much of the rebuttal may very well track the proposed cross. Some of the rebuttal may end up having to be eliminated if the proposed cross ever takes place and/or the amount is shifted around.

What I'm asking for is -- my first optimal choice is, with respect to any rebuttal of Dr. Timm, the Board will

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allow me to file that after Dr. Timm's testimony, if his testimony is in fact given. Presumably we will know between now and February 28th whether his testimony is ever going to be rendered.

If the Board is unwilling to do that, I haven't thought this through completely but I'd like to be able to work out some procedure by which I could file the rebuttal but it would be under a protective order such that Dr. Timm could not see it and no one would be permitted to discuss it with Dr. Timm.

I think it's a very modest request in view of the big deal other counsel have made as to the way they wish to cross-examine.

CHAIRMAN COUFAL: That sounds not entirely out of line, Mr. Brenner. We'll accommodate you.

MR. CHERRY: Did you say it's not out of line?

CHAIRMAN COUFAL: You may be heard very briefly.

MR. CHERRY: I don't care what you do, but the question of seclusion or exclusion of witnesses, et cetera, had to do with credibility. Earlier today I said that I wanted to proceed on my cross-examination in a certain way, and the Board said "Tough. You're here, and you'll proceed in the way the testimony goes in."

The purpose of the rebuttal testimony was to get all of the information on the record. These parties will

blt 9

have had Dr. Timm's testimony for a month or more and conversations with him. Now, the suggestion that the search for the truth on these technical matters that don't involve credibility or don't involve dealing with other parties is to be hidden, because Dr. Timm is to be surprised, et cetera, it seems to me to make a mockery of the whole system.

I frankly don't care what you do, but the suggestion of the Regulatory Staff that they are not interested in getting the information but they'd like to devise a procedure so that Dr. Timm or anybody else can be embarrassed because he hasn't read a particular report--I think I'll tell Dr. Timm that in terms of his response to whoever calls him up, because you're not looking for an expert; you're looking for a sham.

If you're suggesting --

CHAIRMAN COUFAL: We're not suggesting anything, Mr. Cherry. We're listening to you argue. We're listening to Mr. Brenner argue, and we've said please keep it brief.

MR. CHERRY: Credibility is one thing; if we're in a search for truth, it's quite a different thing.

I think it's a highly insulting matter that a witness who is being asked to come, or a suggestion of being asked to come, when he's obviously got to take some concern over both his career and taking on this job as well as funds, that he can't be provided with as much information as is



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possible.

CHAIRMAN COUFAL: All right. We understand the position of both the parties.

Mr. Renfrow, I'm sure you don't have a position on this.

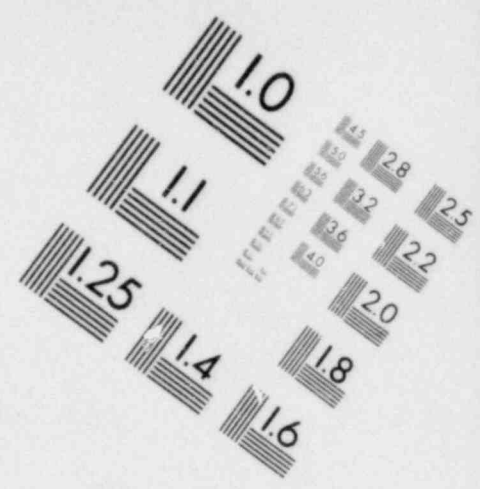
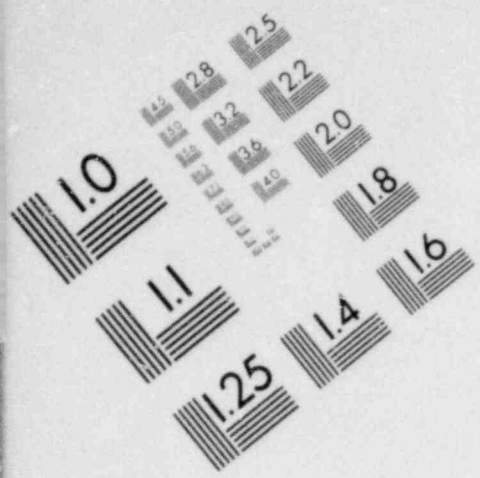
MR. RENFROW: I'm going to keep out of this one. I'm going to be quiet for a change.

MR. BRENNER: Mr. Chairman, I have one other minor matter. I'll state it, and I don't think there is any need for a response or action by the Board at this time.

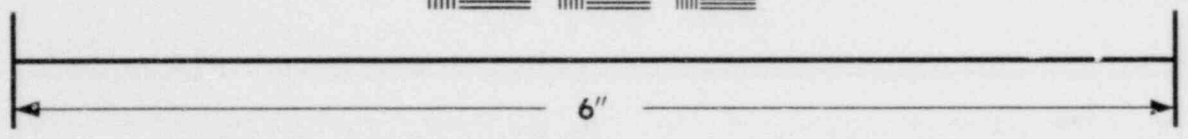
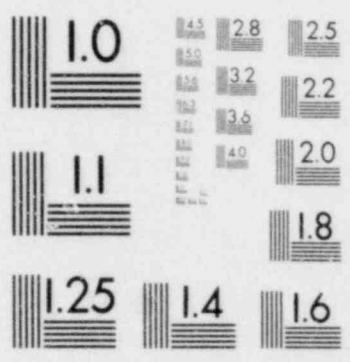
I'm troubled -- I have problems in stating things that I'm going to ask the Board later which may affect Mr. Cherry and his client; and, as Mr. Cherry says, "Well, I may be here. I may not be here, and so on." That being the context, I would like to make one statement.

It is typical in proceedings for the Board pursuant to 2.734 to direct the parties to file findings in the proceeding. We were going to ask that at the conclusion at the proceeding. I would like to ask the Board now if they could act right away to announce that yes, they do plan to direct the parties to file findings or whatever are the closing documents the board wants to call it of all parties.

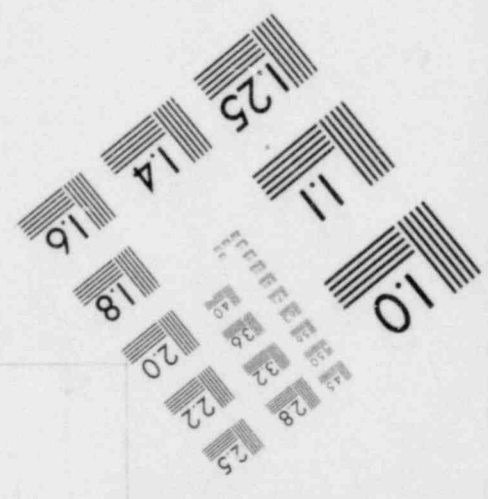
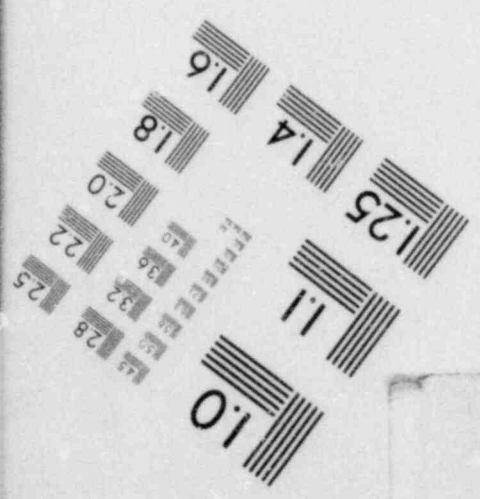
I think it's very important in this proceeding especially, notwithstanding the fact that this is going to be an interim suspension proceeding, with the word "interim"

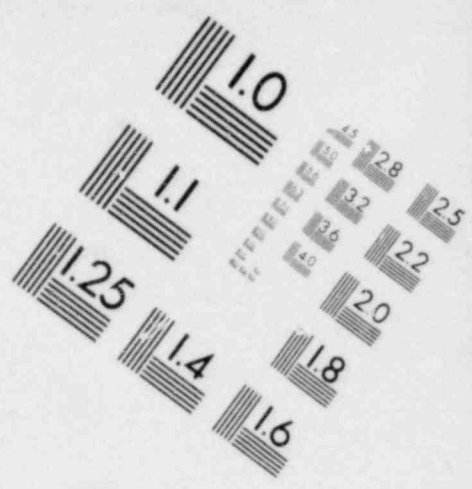
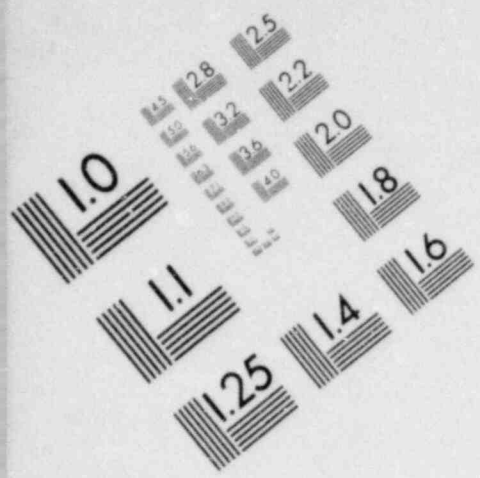


**IMAGE EVALUATION  
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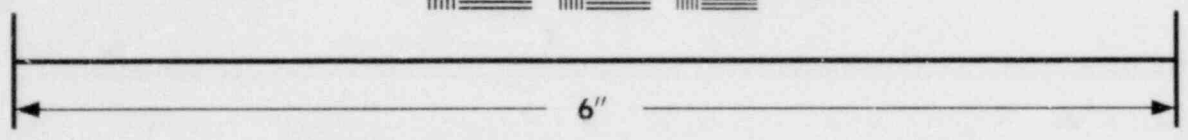
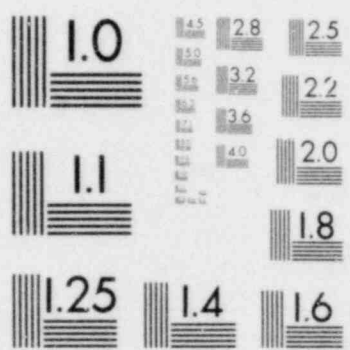


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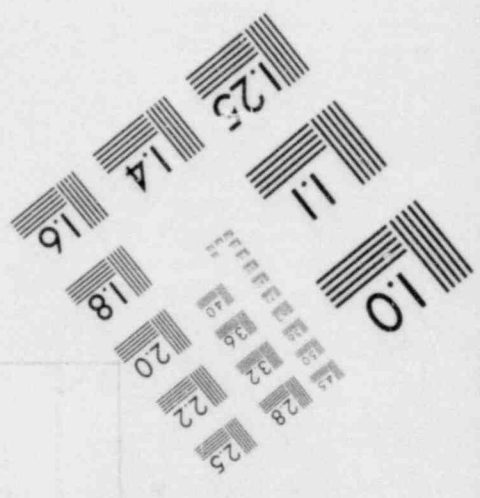
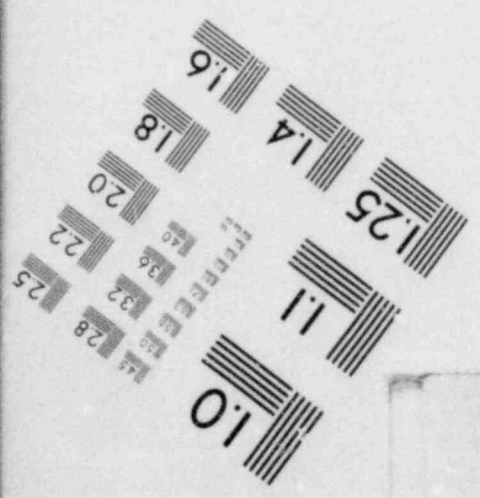




**IMAGE EVALUATION  
TEST TARGET (MT-3)**



**MICROCOPY RESOLUTION TEST CHART**



11 perhaps denoting something less than a full proceeding --

CHAIRMAN COUFAL: We do expect, Mr. Brenner, the parties to file findings.

MR. BRENNER: Are you going to formally direct the parties within the words of 2.754?

CHAIRMAN COUFAL: We will direct the parties to file findings.

MR. RENFROW: I have one short, quick matter.

To protect my position, Mr. Chairman, I would like to proffer now the witnesses that I've had available and could have available for the rest of this week to fill it up on the steam generators, the coal, the Dcw alternative, and the finances.

I could have them, I believe, here by 10:00 o'clock in the morning to finish the week up if the Board so wishes.

CHAIRMAN COUFAL: Thank you. We do not so wish.

MR. RENFROW: Thank you.

CHAIRMAN COUFAL: All right, we'll be adjourned.

MR. CHERRY: Mr. Chairman, Mr. Brenner's motion asking you to direct the parties to file findings, knowing full well that I may not be in a financial position to do so, is a deliberate attempt to take advantage of an Appeal Board ruling which says the parties are directed to file findings and if they do not they lose their appeal rights.

I'm not going to oppose the motion, because you've

b1 12  
already ruled on it; but I simply don't think it's fair for you to go ahead and direct those findings, understanding my financial position and knowing full well what Mr. Brenner is trying to do.

You can make up your own mind, but I don't think it's fair.

MR. BRENNER: I will state what I'm trying to do very simply. I'm trying to assure that the regulations as written and as implemented by the Appeal Board are carried out, especially since there are prior rulings with respect to Mr. Cherry himself.

Number 2 is, as the Board knows -- and I've probably been trying the Board's patience with this through the proceeding, but my patience has been tried, also -- there have been many unsupported, vague allegations and many what I deem to be mischaracterizations of the record. The real fix for that in terms of the completeness of the record is to have findings from all the parties by which the parties are forced to point to where in the record these things were stated and to assure that the references aren't to statements of counsel but to testimony of witnesses and so on.

As the Appeal Board has stated, many times there is a real need for findings by a party who will later claim that something erroneous was done by the ruling body.

I think it's important that findings be directed in

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any proceeding.

CHAIRMAN COUFAL: We understand your position. We understand Mr. Cherry's position. We understand Mr. Renfrow's position. We understand Mr. Nute's position.

MR. RENFROW: I will insist that findings be filed so far as my own argument is concerned. I will leave that matter there. I assume we will address it again. I feel it is very important for all the parties to do that.

DR. LEEDS: I'm sorry, Mr. Renfrow. I'm not sure I understand what you're saying there.

It's very important for you to file findings?

MR. RENFROW: It's very important for all the parties in this proceeding to file findings of fact before this Board, and I will argue very strenuously that the Board should direct that that be done.

I will leave that until a later time.

MR. BREMER: Mr. Chairman, this is a 30-second matter. You asked me to bring it up again.

I almost forgot. I apologize. But there are those two pieces already identified in the record from Dr. Timm which I have not gotten.

I'm going to be in Chicago at least through tomorrow morning, and I would appreciate if someone from Mr. Cherry's office, if not Mr. Cherry himself, can call me in the morning and inform me whether it is at his office or not.

blt14

If that is at his office, I can make arrangements to pick it up there. If it's not, I can make arrangements to have them mail it to me.

I hope the Board would enter one or the other alternatives be done so I'm not reduced to Mr. Cherry's good nature with respect to production of documents to me, which doesn't exist.

MR. CHERRY: I'll probably sleep late tomorrow. I won't be down to my office. Mr. Brenner can call my secretary and inquire.

I'll tell her tonight that if he comes over to make it available to him. I'm not going to call him, because I won't be in my office.

MR. BRENNER: That's perfectly acceptable. If they're not there, do I have agreement or else the direction of the Board that it be mailed out to me as soon as it comes in?

CHAIRMAN COUFAL: Yes, you have that order of the Board.

MR. CHERRY: Mr. Chairman, is it also clear that all of the backup for rebuttal and supplemental redirect is to be filed along with the testimony on the 28th?

CHAIRMAN COUFAL: I don't remember what we said on that. I remember the matter was addressed in the transcript. What the conclusion was I don't remember.

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MR. CHERRY: Can I ask you to direct that all testimony be filed on the 28th, including the backup, so we don't have these problems?

CHAIRMAN COUFAL: By backup do you mean the documents that you would ordinarily get? Define "backup."

MR. CHERRY: A representation by the attorney filing the testimony that the documents included with the testimony are sufficient to enable an objective observer to understand and go to some of the background data.

Like when I filed Dr. Tirm's testimony I filed the backup documents. There were three additional documents that were asked for that I gave.

CHAIRMAN COUFAL: I understand.

MR. CHERRY: But I made an honest representation to put in what I thought was sufficient.

CHAIRMAN COUFAL: I'm going to check the transcript. I think that matter was handled when we originally did that. If I'm wrong, we'll handle it, Mr. Cherry.

MR. BRENNER: Maybe I can and maybe I can't. Do you want to give me a chance to insist?

CHAIRMAN COUFAL: To do what?

MR. BRENNER: To insist on this matter.

CHAIRMAN COUFAL: I think you volunteered to.

MR. BRENNER: With respect to Mr. Gunderson's testimony, it was identified that Mr. Cherry wanted the



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computer runs for the loss of load probability analysis, and I will provide it.

I also made a good-faith effort to provide other documents which they relied on in any of the testimony we filed. The problem that we have is Mr. Cherry says he wants "all the backup." It's hard to know what that means.

With respect to Dr. Feld's testimony, to avoid any misrepresentation, we had a big pile of stuff that Mr. Cherry then turned around and said, "I didn't want all of this junk."

MR. CHERRY: That's not true. I never said it. You made it available at times when I was out of town. You said you'd charge me some 10 to 25 cents a page at Glen Elyn, so I didn't go.

MR. BRENNER: I'm talking about when we handed you the document at the prehearing conference which was held in Chicago in the other building.

CHAIRMAN COUFAL: All right, we'll handle it.

MR. BRENNER: I'll give everything that I know is principally relied on or expressly relied on. I don't know sometimes what he means by "backup."

CHAIRMAN COUFAL: We're adjourned.

(Whereupon, at 5:10 p.m., the hearing in the above-entitled matter was adjourned, to reconvene at 9:30 a.m. on Tuesday, March 7, 1977.)

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