

NUCLEAR REGULATORY COMMISSION

Regulatory Docket File

IN THE MATTER OF:

CONSUMERS POWER COMPANY

(Midland Units 1 and 2)

THIS DOCUMENT CONTAINS
POOR QUALITY PAGES

Docket Nos. 80-329
80-330



Place - Chicago, Illinois

Date - Friday, 4 February 1977

Pages 2004 - 2128

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

Friday, 4 February 1977

Hearing in the above-entitled matter was convened pursuant to notice at 9:50 a.m.

BEFORE:

- FRANCIS J. COFFAL, Esq., Chairman
- DR. J. VERN LEEDS, Member
- DR. EMMETT LUEBKE, Member (Not present)

APPEARANCES:

(As heretofore noted.)

C O N T E N T S

<u>Witness</u>	<u>Direct</u>	<u>Voir</u> <u>Dire</u>	<u>Cross</u>	<u>Redirect</u>	<u>Recross</u>	<u>Exam.</u> <u>Board</u>	<u>Cross</u> <u>on Board</u>
Daniel M. Noble	3016	3034					
F. S. Echols	3056		3061	3122	3127		

E X H I B I T S

<u>No.</u>	<u>For</u> <u>Iden.</u>	<u>In.</u> <u>Evi.</u>
Dow Exhibit No. 1 (Document Listing, 1 page)	3013	---

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(Before formal commencement of today's hearing, the following was dictated by Dr. Leeds to the reporter.)

DR. LEEDS: The Board has reviewed the material supplied with Dow Exhibit 1, for which Dow claims either privilege of attorney-client or work product.

The Board has decided to release two items on that list.

Because we have given the Licensee the opportunity to review our rulings prior to the actual release of the documents, we are going to do the same with respect to Dow documents also. We are holding all the documents except two.

The first one is item number two on Exhibit 1, a letter of October 6, 1976 from L. F. Nute to Milton Wessel, which is merely a transmittal letter.

And item number twelve, a letter dated September 21, 1976 from L. F. Nute to John A. Friedman, which is also merely a transmittal letter.

Licensee last night presented to the Board a five-page document, handwritten on yellow sheets, entitled "Licensee's Argument as to Privileged Documents."

The Licensee also tendered the documents and the Board has reviewed the documents and the Licensee's argument as to privileges and has modified their prior rulings to the following:

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First, the Board did not receive the schedule prepared by CP Company's attorneys, which was listed in Item I, Privileged Documents, Consumers Power Company Legal Department Files.

This appears to be the same type of item as G3-005, and the Board would hold that document, also.

I am going to ask the Court Reporter at this time to type into the transcript the entire five pages of the argument on the documents given by the Licensees, so that all parties will have copies of this information.

She will also indicate the Board's rulings, which are marked on the original argument presented to the Board by the Licensee.

I. Privileged Documents, Consumers Power Company Legal Department Files.

1. Schedule prepared by CPCo attorneys.

Hold.

2. Handwritten notes of attorney for CPCo.

Waived.

3. Waived.

II. 1. G3-005: Schedule prepared by CPCo attorneys.

Hold.

2. G3-024: Waived.

3. G10-009: Waived.

4. G2-008: Draft by CPCo attorney.

Hold.

mm3

5. G11-002: Waived.

6. G11-010: Information requested by attorney with regard to litigation.

Hold.

7. G11-011: Advice to client prepared by attorney with respect to litigation request.

Hold.

8. G11-015: Information requested by attorney with regard to litigation.

Hold. Same as G11-010.

III. G6 001: Furnished first six pages.

Rest, proprietary claim.

1. G6-218: Information requested by attorney with regard to contract matter.

Hold.

2. G6-236: Waived.

3. G6-299: Waived.

4. G6-300: Waived.

IV B-2: Handwritten comments by CPCo attorney and redraft by CPCo attorney.

Hold.

B-3: Handwritten comments by CPCo attorney.

Hold.

B-4: Waived.

V 1. G9-020: waived.

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2. G9-050: Handwritten comments to draft prepared by CPCo attorney.

Hold.

3. G9-053: Waived.

4. G9-106: Draft prepared by CPCo for client review.

Hold.

5. G9-108: Client notes including requests to attorney with facts not released to public.

Release all except request to attorney.

6. G9-159: Waived.

7. G9-160: Waived.

8. G14-077: Waived.

VI B-5: Handwritten note by CPCo attorney.

Release all but handwritten note.

VII 1. 110-39: Schedule prepared by CPCo attorney.

Hold.

2. 200-19: Draft prepared for CPCo attorney; transmitted to third party agent for comments.

Release.

3. 220-066: First page prepared by CPCo attorney; second page prepared by CPCo personnel to assist CPCo attorney in preparing case.

Hold.

4. 220-100: Notes taken by CPCo personnel during

meeting with CPCo attorney on approach to litigation.

Hold.

5. 220-113: Same as 220-100.

Hold.

6. 400-001: Waived.

7. 1: All handwritten notes are CPCo attorney's made in preparation of case.

Hold.

8. 7: All handwritten notes are those of CPCo attorney.

Release all except marginal notes.

9. 13: Waived.

10. 15: Second page, carry over paragraph, lines 2-5 are legal opinion of counsel to client and were not communicated to Dow.

Release except last two sentences of last paragraph.

11. 16.: Waived.

12. 17: Waived.

13. 18: Cover letter waived; 18(a) R. L. Drake is CPCo attorney and contains advice to counsel.

Hold.

14. 34: Waived.

15. 35: Waived

16. 37: Waived.

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17. 38: Document is proprietary.

18. 39: Document contains facts transmitted to
CPCo attorney for use in contract negotiations.

Hold.

19. 40 and 41: 40 first two paragraphs released;
41 cover page released.

20. 43: Waived.

21. 44: Proprietary.

22. 46: Proprietary.

23. 47: Attorney's notes relating to drafting of
contract.

Hold.

G12-007: Same as 15 above.

G10-098: Twopages of fuel costs removed.

G12-213: Released except for fuel costs.

Same as documents above.

G10-072: One page on fuel costs removed.

G10-079: First two pages released.

G10-055: Released except for last page.

G10-054: Waived.

G10-043: Waived.

mm7

P R O C E E D I N G S

CHAIRMAN COUFAL: Good morning ladies and gentlemen.

MR. CHERRY: Mr. Chairman, I want to repeat on the record what I said about leaving. I am sorry about being late, it was because of the weather. If the additional time interferes with somebody getting a plane today, I will be glad to cut my examination short.

CHAIRMAN COUFAL: Thank you, Mr. Cherry.

Mr. Cherry is here for the Intervenors other than Dow.

Mr. Tourtellotte, Mr. Hoefling, Mr. Kiefer for the Staff.

Mr. Renfrow for the Licensee.

Mr. Pribila, Mr. Nute and Mr. Duran for Dow.

Yes, Mr. Pribila?

MR. PRIBILA: Mr. Chairman, I have a couple of preliminary matters.

Pursuant to a Board Order dated January 7, 1977, we have additional pages for the transcript of the 14th of December 1976, which were circulated yesterday to the parties, and I will now pass them out and have additional copies for the Board.

CHAIRMAN COUFAL: Thank you, Mr. Pribila.

Yesterday you handed to us a piece of paper marked Dow Exhibit No. 1, which was a list of documents for which you

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claim privilege.

That was not received.

Was that offered as an exhibit, or what was the situation with regard to that, Mr. Pribila?

MR. PRIBILA: We offered that as Dow Exhibit No. 1. Are you talking about -- did you say Exhibit 1, or was it 2?

CHAIRMAN COUFAL: Exhibit 1.

MR. PRIBILA: This was offered to the Board for determination of whether these documents were privileged as Dow had claimed.

Dr. Leeds has indicated that you looked at these last night and Items 2 and 12 you had decided you would release unless we had additional arguments to make.

And we have looked at Items 2 and 12 and we have nothing further to add.

CHAIRMAN COUFAL: All right, they will be released.

Mr. Pribila, my question is, do you want this piece of paper which is marked Dow Exhibit 1, received in evidence in this case?

MR. PRIBILA: No, sir.

CHAIRMAN COUFAL: All right.

(Whereupon, the Dow list of documents claimed privileged, was marked Dow Exhibit No. 1 for identification.)

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DR. LEEDS: I would like to state to the record that I have returned to the Applicant the documents that he gave me last night which we have been looking at and releasing, which are proprietary claimed, or are claimed work product and attorney-client privilege.

The Reporter has a list of our rulings, and I have transmitted orally to the Applicant these rulings, and the Applicant, I understand, will make copies of the ones that we have ordered released, and they will be available sometime today, hopefully.

Is that correct?

MR. REMFROW: That is correct.

Let me add one other thing.

There still is discussion about whether or not the Board wished to receive one copy of all documents they had ruled upon to be sealed and put into the record, pursuant to Mr. Cherry's request.

If the Board wishes to follow that procedure, I will make the necessary arrangements to have all of those documents copied.

And if the Board wishes, instead of providing those to you here, I will mail them to your Washington office so they will be there and you can make the arrangements.

I am just looking for your guidance on what you wish us to do, pursuant to the request.

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CHAIRMAN COUFAL: Sounds like a good idea, Mr. Renfrow

MR. RENFROW: Did you say yes, sir?

CHAIRMAN COUFAL: I said yes, that sounds like a good idea.

MR. CHERRY: Mr. Chairman, yesterday one of the Staff witnesses, Mr. Echols, indicated that he would like to go on first so that he could get back to Washington. And I said I would support that request.

And if Mr. Echols wants to go on first, that is all right with me.

MR. RENFROW: I'm sorry, Mr. Chairman. I didn't know we were going to do that, and I am not prepared to do any cross-examination of him. Mr. Rosso was going to do that.

I can call Mr. Rosso and ask him to come over immediately, or we can start with Mr. Noble and I will ask somebody else to call Mr. Rosso, who will then come over and do Mr. Echols.

CHAIRMAN COUFAL: Well, let's start with something.

Let's start with Mr. Noble and if we have to break into it, we will break into it.

MR. RENFROW: Give me a minute to make arrangements with Mr. Rosso, sir.

(Recess.)

CHAIRMAN COUFAL: Mr. Noble, you have not testified in this proceeding before, have you?

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Whereupon,

DANIEL M. NOBLE

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

DIRECT EXAMINATION

BY MR. RENFROW:

Q Mr. Noble, I hand you a ten-page document and ask you to review that document, please.

(Handing document to witness.)

(Witness reading document.)

Was that document prepared under your supervision and direction, Mr. Noble?

A Yes, it was.

Q Is it true and accurate to the best of your knowledge?

A Yes, it is.

MR. RENFROW: Mr. Chairman, I have provided the Board and Parties with copies of this document yesterday, provided the reporter with 30 copies of the document and will request that it be bound into the transcript as if read.

CHAIRMAN COUFAL: Is there objection?

MR. CHERRY: I would like to have a statement by Mr. Rosso as to the relevance of this in the proceeding.

CHAIRMAN COUFAL: Mr. Renfrow, you mean?

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The objection has been made that the document is irrelevant. Do you have a comment to make?

MR. BENDER: Certainly, Mr. Chairman.

In the previous testimony of Mr. Heins, there was questions asked as to the bases for the assumptions as to Palisades and Applicant's assumptions concerning the derating of Palisades and removing Palisades from the line.

If you will remember at that time Mr. Heins stated that the technical information that he received as to Palisades as to which he made his planning decisions was received from Mr. Noble.

This will provide the Board and the Parties with the backup documentation for that technical decision that was given to Mr. Heins, upon which he did his planning.

In that case, Mr. Chairman, I think it is totally relevant to the proceeding.

MR. HOEFLING: Mr. Chairman, I think Staff's position is that Mr. Noble's testimony clearly goes to support the statements by Mr. Heins as to the manner in which the Palisades reactor was incorporated into the load forecast for Consumers Power testimony on the need for power.

MR. CHERRY: Mr. Chairman, the difficulty I have with Mr. Noble's testimony, is as follows:

An assumption was made as to the Palisades corrosion matter. But, as I view it, that raises much more severe issues

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than just the assumptions made by Mr. Heins. It raises the question of the safety of the Palisades plant to operate under these conditions.

And it seems to me that if the Board loses this testimony in at this stage of the proceeding, as opposed to the remanded hearing, we are opening up the whole question of the safety of the Palisades reactor in connection with at least the timing of repairing it.

And I do not think it is fair to have the Applicant assert that there is a problem with Palisades so severe that it is sufficient to render it inoperable, but not deal with the question of safety, because steam generator tubes have a direct impairment relationship of the emergency core cooling system. And this Board knows, or will find out shortly on the examination of Mr. Noble, how sensitive that relationship is.

And I think that the testimony is incomplete unless the Applicant is prepared to go forward and put in testimony on the question of the safety of the operation of Palisades, and the Staff should deal with this question. And the Applicant is in a position where he can assert that there is a problem in the nuclear reactors, but then not have to go far enough to determine whether or not the resolution of that problem is such that it has to be done, or whether it is inconsistent with Mr. Heins' assumptions.

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So I don't think the testimony as offered is complete enough to be relevant.

CHAIRMAN COUFAL: My problem is, I see it a little differently than you, Mr. Cherry, and let me tell you how I see it.

One of our problems is that Dr. Luebke, who is not present, was the Board member who asked for this information. And I thought at the time that was questionable, because, if we get into the status of every Consumers' plant that may go into their ability to produce power over the next few years, we are going to go into collateral issues where we will be here until we all retire.

That is my problem with it. I'm sorry that I was not more outspoken with that point of view when Dr. Luebke raised it. I thought I was going to get to him and sidetrack him, but I didn't.

I am inclined to believe that this does raise -- if we get into collateral issues like this, we are liable to get into the possibility of a strike somewhere in 1978 or whatever. It just seems to me that the ramifications are extraordinary and I ask you to comment on my problem.

Does anybody have anything to say with regard to that?

DR. LEEDS: Let me comment, too, and then we can get both of them at once.

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It seems to me that there are two critical items here:

One is, will Palisades be derated by 5 percent per year, which I think was the number Mr. Heins used?

And, what is the basis for that particular number? That does not go to the safety of the Palisades plant as I see it. I am not saying the safety of the Palisades plant may not be an important issue or important item. But it seems to me we were asking for this testimony with respect to the 5 percent and I am trying to remember what went on that day.

MR. CHERRY: Mr. Chairman, perhaps I can help Dr. Leeds.

After the cross-examination of Mr. Heins, it became clear that Mr. Heins' basis for derating the 5 percent was based upon what he had gleaned from other people, presumably Mr. Noble and others.

It also became clear that no one had ever told him that the particular depreciation of the Palisades internals would, in fact, lead to 5 percent. That was a guess, and it was not an assumption based on anything, because Palisades in fact has not been derated by 5 percent as of this time.

Point number two, Mr. Heins testified that even if there were that problem, they could shut it down in '78, '79 when they had up to 1000 megawatts or more to purchase from Ontario Hydro.

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So even if the problem exists, Mr. Heins has admitted on cross-examination that there is a sufficient way to remedy the problem.

Therefore, if we now deal with this underlying problem, we are going forward to put information in the record, which then raises the whole host of alternatives that should be explored at the remanded hearing, particularly if suspensions were had. And that is, what else on Applicant's system is it likely possibly to do.

For example, the Applicant has had accidents with respect to other plants, and as Mr. Coufal has suggested, that raises all of those issues. And Applicant, it seems to me, cannot have it both ways, to put in that kind of private case and narrow issues.

So I don't think that Mr. Noble's question goes to Mr. Heins' testimony because the problem is, if it exists -- and I am willing to assume for the sake of argument, to assume that it exists -- when can it be resolved. Mr. Heins' testimony said it could be resolved earlier than 1981.

Mr. Noble doesn't deal with that question at all.

MR. RENFROW: Mr. Chairman, I would like to respond to that, and I think Dr. Leeds is on the right track.

The question is not the safety of Palisades. That is not the question before this Board.

There were certain assumptions that were made by

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the planners who planned for what this system would need in terms of generation capability in the future.

Those plans are based on certain assumptions. One of those assumptions, particularly, whether or not Palisades would be derated by 5 percent a year; and second, whether or not it would have to be taken off in 1981 and '82, was one of the assumptions made.

That was challenged by Mr. Cherry. And indeed, while I don't agree with what he testified to for Mr. Heins, Mr. Noble can make it clear that from a technical point of view the 5 percent number is a reasonable number. That supplies the bases for the judgment that Mr. Heins made as a planner.

Second of all, we have not got into the issue of safety, nor do we intend to. The question that is here is the technical support for Mr. Heins' planning decision.

I believe, Mr. Chairman, that in Mr. Noble's examination, it will be clear that from the planning purposes, there may be available purchase power in '78 and '79. But, that from a technical point of view you could not replace or retube the Palisades steam generators between that period of time.

And therefore, it is totally relevant to the question, the assumption that the licensee's planners made when they presented their case before the Board.

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You know that --

CHAIRMAN COUFAL: Well you are saying theoretically it's irrelevant if he can show that there is going to be ice in a hydro plant, that is irrelevant?

MR. BENTON: If he shows that for the last 20 years ice has got into the hydro plant, we can't operate it six months out of the year, and therefore the system capability is down, and he has that data and he used it, I would suspect it would be a good assumption.

But I don't know that until I ask him what his assumption is. But, if he used it to get to his answer that he presents before the Board, then certainly I have a right to ask him what his assumptions are.

MR. CHERRY: Mr. Chairman, one other point I want to make and that is this:

While this Board is not going to determine the safety of the Palisades reactor operating under a hypothetical assumption which is in Mr. Noble's testimony -- and they are hypothetical because there has been no inspection made whatsoever to determine whether the situation exists or not when you read Mr. Noble's testimony -- if this Board is going to permit that in, then it must also permit in an inquiry as to the timing of repair. And the timing of repair goes to the gravity of the situation in terms of the safety.

So while we are not going to determine whether or

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I agree with this Board that you have no assumptions sitting out there as to X, Y and Z plants that are not going to bring all of it in.

Let's go to a different problem, an analogous problem where the question of the contract with Commonwealth Edison for the 316 megawatts from Luddington came in. I intend at some point in time to present that contract as an exhibit, to show that the assumption made by Mr. Heins that 316 megawatts would have to be sold to Commonwealth Edison, indeed had a basis upon which to be made.

All Mr. Noble will provide this Board is the basis for the 5 percent number in the 1981 and '82 dates, and I believe it is totally relevant to this proceeding.

I also agree with the Board that the question of safety as to Palisades is not before this Board.

The question as to Palisades and operation of Palisades has been handled by the NRC. There have been notices of opportunity for hearings and reviews, and that is still ongoing.

So the testimony that is put before the Board today is limited to the issue of, is there a basis for the assumption that Mr. Heins made in his planning to meet the demands that are projected for the Consumers system in the future.

In that regard I think it is totally relevant,
Mr. Chairman.

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CHAIRMAN COUFAL: What are you going to do if later on, Mr. Cherry, when he is putting on his case, brings on a host of witness or theorizing that are going to testify that you are going to have a flood somewhere, some hydro plant you have got is going to be bothered by ice this winter, and therefore it will be down, or there is going to be a strike in some other plant, or whatever, your transmission lines are all going to blow down during a cyclone or hurricane, or whatever you have in Michigan, this spring?

It seems to me we are getting into a maze.

MR. RENFROW: Mr. Chairman, I am going to do the same thing Mr. Cherry did with my witnesses. If I disagree with that assumption, I am going to ask him for his basis.

CHAIRMAN COUFAL: Do you agree that all that kind of thing will be relevant?

MR. RENFROW: Mr. Chairman, I made my objections as to relevance, the Board has overruled them and let them in.

If I disagree with Mr. Cherry's witness and I say what is your basis for a cyclone blowing over transmission lines --

CHAIRMAN COUFAL: You are not facing up to the problem. I say, supposing Mr. Cherry comes up, proposes that kind of testimony, are you going to agree that that is relevant?

MR. RENFROW: I am going to ask the person what the basis for the assumption is, Mr. Chairman. Perhaps he knows.

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not it is safe in that sense we have got to determine whether or not the condition is such that it will be impossible to wait until 1981 and '82 to fix it.

Mr. Noble doesn't tell you that. He conveniently avoids that and it seems to me that you are not getting that kind of information. And it seems to me that that is exactly what I am going to get into if this testimony comes in.

DR. LEEDS: Mr. Renfrow, let me ask you another question:

In all of the discussion I can't remember. The testimony has been offered, but nothing else, right?

Has it been offered yet, the testimony?

MR. RENFROW: Yes, sir.

DR. LEEDS: I look at this and I see that Mr. Noble's background is metallurgical engineering. And yet, I would think that the calculation of the derating from the steam generator tubes, requiring 5 percent per year, talking about heat transfer capability and so forth, would require an engineer who has experience in heat transfer, a mechanical engineer.

Now I don't know from reading his background here, that he has those qualifications. So are we talking about another witness down the line who would have done that calculation?

MR. RENFROW: If you -- I hate to get into

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Mr. Noble's testimony, but let me say it to you two ways.

DR. LEEDS: I understand.

MR. RENNERTON: There is two different pathways that cause derating of palisades. As you --

MR. CHERRY: Mr. Chairman, at this point I think since we are getting in, I would like to have the witness excused while we are having this discussion. I think it is only fair because these are questions, that if the testimony is admitted in, will come on cross, and I do not want the witness to be privy to this.

I think it is only fair.

Could we have the witness excused, please?

CHAIRMAN COUFAL: Mr. Noble, would you step out in the hall until we hammer this out.

(Witness temporarily excused.)

MR. CHERRY: Thank you, Mr. Chairman.

MR. RENNERTON: Now, Dr. Leeds, there are two ways that you get to derating, and I am going to try to state this kind of simply to stay out of Mr. Noble's area.

Both of them are based on the past performance or the past history of steam generator tubes.

Mr. Noble has been involved in that process since Day 1. He has been a member of task forces, he has been head of task forces, and indeed his current job position is to look at the Palisades reactor, see what is going to happen

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to it with regard to the steam generator, and get the information forward.

Now what you do is, you take the history of the Palisades steam generators, the degradation that you have had in the past, and you have to look at two things.

You have to look at the primary system. As you plug tubes you reduce the flow. The limiting factor on that you will find will be your D&B calculation for your -- when you calculate for ECCS.

Now, did Mr. Noble actually go do that calculation?

No.

Was that calculation done under Mr. Noble's supervision and direction and given to him?

Yes.

Secondary side you have a different problem. You have the pressure going through the steam generator tubes to the condensers and out to the cooling towers.

Now while they interrelate, they do not go on one-to-one relationships, and you have to do a thermodynamic calculation, if I can use that word not in its totally technical sense.

Now, did Mr. Noble actually do the arithmetic?

No, he sat down with the man and told him what he wanted done, reviewed his results with him and can give you those results.

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He has been involved directly in the planning of replacement of the steam generators or retubing, if that is required, from a technical point of view as opposed to Mr. Heins' point of view. So basically, what I have tried to provide for the Board in response to Dr. Luebke's questions and what I believe is relevant, is a man who knows the past history of them because that is the basis upon which the projections are made; a man who has had reported to him the calculations that were done, how they were done, for both the primary and the secondary side; and a man involved in the planning of what will happen in the future with Palisades, should, for example, degradation slow down, or degradation continue.

In addition, you heard the questions by Mr. Hoefling on the sleeving program for Palisades, and whether sleeving will get rid of the 5 percent.

Mr. Noble is in charge of the developmental work for the sleeving program and he can testify to that.

Now, I guess if you ask me the question point blank, did he do the arithmetic for the D&B calculation to determine what the reduction was? No.

And if somebody wants to get in that definition, maybe we would have to get somebody, have somebody else.

I don't think that is necessary because all he is going to do is provide you the parameters.

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Now, I have got Mr. Echols testimony, if this is going to go on, and Mr. Echols does really need to get back. I am willing to either finish this argument, or if we are going to go on for a while, break him off and put him on.

CHAIRMAN COUFAL: Do you want Mr. Echols on?

MR. CHERRY: No, no. I want to finish Mr. Noble. I don't want him to have an opportunity to have some time to consult with counsel. I would like to have this matter resolved.

I think on the basis of Mr. Renfrow's statement, that Mr. Noble is not the person who did the calculations. We don't even know if the calculations were computed correctly. You know, this is just a really foolish way to approach the problem, Mr. Chairman, and Dr. Leeds.

It seems to me that if I had the power to get prompt answer to this question, I would ask two questions:

Does safety impair the operation of Palisades between now and 1981?

If yes, why don't you fix it.

If no, why didn't you fix them earlier and what are your problems?

What is really what this is all about. To get into the technical discussion of the underlying assumption, Mr. Noble is only making more guesses anyway. And yesterday I was told in questions I asked, and the objections were sustained, that

was a hypothetical situation. That is what this is. This is a hypothetical situation used to try to beef up a case that doesn't support the construction purposes.

MR. RENFROW: That is incorrect, Mr. Chairman.

He can answer those two questions. He can answer straightforward and direct. He knows those answers.

MR. HOEFLING: Mr. Chairman, it would appear from MR. Heins' testimony that one of the bases of the results reached in that testimony was exactly the question that Mr. Noble is here to address, the 5 percent derating of Palisades.

The inquiry was made as to the basis of that 5 percent, and I think it is a fair statement to say that Mr. Heins indicated that he relied on judgments made by Mr. Noble as to concluding that that 5 percent was appropriate.

Mr. Noble is here to explain that bases. It would appear reasonable to put him on and to get his views on it for a clear record, if for no other reason.

MR. CHERRY: Mr. Heins never said what Mr. Hoefling just said. He never said he relied on judgments made by Mr. Noble. He never said that.

MR. RENFROW: That is not correct.

You see, we once again have the record --

CHAIRMAN COUFAL: Well -- I didn't mean to cut you off.

MR. RENFROW: All Mr. Heins said was, he got the

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input from Mr. Noble as to the technical decisions and then made the judgment as a planner on what he ought to do for the future.

He can provide you the technical basis. And I guess, Mr. Chairman, to show you -- if Mr. Noble says that from a technical point of view the 5 percent has no basis, then I guess you are going to have to conclude something about Mr. Heins' conclusions.

If, on the other hand, he says from a technical point of view the 5 percent is basically correct, then you have got Mr. Heins' assumption backed up.

That is what this witness is provided for.

(Board conferring.)

CHAIRMAN COUTAL: Mr. Renfrow, bring Mr. Noble in.

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Begin 1

CHAIRMAN COUNSEL: Okay, proceed, Mr. Renfrow.

MR. CHERBY: The Board has overruled the objection?

CHAIRMAN COUNSEL: Yes, we're overruling the objection as to relevancy.

MR. RENFROW: Mr. Chairman, I would ask that the ten pages identified by Mr. Noble be inserted into the transcript as if read.

CHAIRMAN COUNSEL: Is there objection?

MR. HOEFLING: No objection.

MR. CHERBY: I don't have any objection.

(The Board conferring.)

CHAIRMAN COUNSEL: All right. There being no objection, the document described by counsel as ten pages of Mr. Noble's testimony is received and will be bound into the record as if read.

(Document follows.)

Question

Please state your name and business address.

Answer

My name is Daniel M. Noble. I am employed at Consumers Power Co, 1945
W Parnall Rd, Jackson, MI.

Question

What is your position with Consumers Power Company?

Answer

My present position within the Company is that of Director of the Operating Services Department which provides technical and administrative services to electric generating facilities.

Question

What is your educational background and business experience?

Answer

I received a B.S. in Metallurgical Engineering in 1965, and a M.S. in Metallurgical Engineering from Michigan State University in 1967. I began employment in June of 1967 as a Metallurgical Engineer in the Company's Karn-Weadock electric generating plants. I transferred to the Company's general offices in Jackson, MI in 1968 as a Metallurgical Engineer. I have also served as a Nuclear Fuels Engineer and Technical Services Administrator. I have worked on various technical projects involving both electric and gas generation and transmission systems with special emphasis on the area of materials engineering. I received an MBA degree from Wayne State University in 1972.

Question

With regard to your experience in materials engineering, state your involvement in Palisades Plant regarding its steam generators.

Answer

I have been a direct participant in Company efforts related to the Palisades Plant's steam generators since January, 1973. In 1974, I was selected as a member of the engineering task force assembled by the Company to analyze and propose solutions to the corrosion of inconel tubing in the steam generators. My primary responsibility on the task force was to establish the corrosion mechanisms. In my position as Director of Operating Services, many of the inspection and repair efforts associated with the steam generators are the responsibility of personnel under my supervision.

Question

Would you set forth the history of corrosion of inconel tubing in the Palisades steam generators?

Answer

The Palisades Plant has two vertical, U-tubed steam generators which transfer energy produced in the nuclear core to produce steam which is fed to the turbine generator.

The Plant's steam generators first exhibited signs of corrosion of inconel tubing in January, 1973. Evidence of continuing corrosion has been received while conducting subsequent inspections.

Evaluation of the inspection data and laboratory analyses have led us to conclude that four types of corrosion have occurred within the steam generators. Two basic types are wastage or wall-thinning which has occurred primarily at tube support plates and intergranular corrosion which has occurred at areas between support plates. A third type has been identified as pitting corrosion which has been found at random locations and is thought of as being an immature form of wastage corrosion. Most recently, a fourth type of corrosion has been identified. This type of corrosion was detected during an inspection of the steam generators early in 1976. Inconel tubes were discovered to be slightly dented at some tube support plate locations in both steam generators. Presently, the depth of the dent is minor (average approximately 0.002" on the diameter) although the number of tubes affected is large. The dents are thought to be caused by corrosion of the tube support plates. The corrosion process generates a corrosion product which builds up in the annular space between the tube and support plate. The pressure of the increasing volume of corrosion product forces the tube inward. The vast majority of this type corrosion takes place on the support plates, and very little thinning of the inconel tube occurs.

Question

Would you please state the steps that Consumers Power Company has taken to eliminate or reduce the corrosion of inconel tubing in the steam generators?

Answer

A tremendous amount of work has been accomplished to eliminate or drastically reduce accelerated corrosion. Samples of inconel tubing were removed from the steam generators. The samples were tested and examined to ascertain the type of conditions which existed and the causative factors which led to the conditions. Eddy current testing was performed at various times during 1973, the summer of 1974 and the winter of 1975 and 1976. The data was analyzed to determine the type, degree and pattern of corrosion as well as patterns and depth of sludge deposition.

The Plant's condenser was retubed in November of 1974. This retubing served to drastically limit leakage of cooling water (and its contaminants) into the steam generators. An extensive program of flushing contaminant chemicals from the steam generator secondary sides was also carried out by operating the Plant in various modes over extended time periods in 1974 and early 1975. These modes of operation included rinses, isothermal flushes and variations in power level to facilitate sludge and chemical removal.

The secondary system water chemistry was converted to volatile (AVT) treatment from a solids or phosphate treatment. Originally, chemicals (phosphates and sulfites) were fed to the generators to control oxygen, pH and provide a buffering action. The results of the examinations conducted on tube samples removed from the generators when related to

other applicable information, led us to conclude that solids treatment was a causative factor in tube corrosion. As a result, Palisades converted to volatile treatment which involves additions of hydrazine for control of oxygen and morpholine for control of pH. This conversion was made in the fall of 1974.

Steam generator blowdown rates have been maintained at a high level. This action reduces impurities such as sulfate and phosphate residuals, keeps solids at a very low level in the bulk water, and permits a better control of water quality parameters. In addition, a stringent set of secondary water specifications has been prepared and have been implemented to reduce corrosion to minimum levels.

Question

What action, other than that previously described, has been taken by Consumers Power to provide for continued operation of the steam generators?

Answer

In order to provide for continued operation, it was necessary to provide assurance that the integrity of the steam generator tubes be maintained under postulated accident conditions. As a result, tubes which had indications of degradation of 50-60% of tubing wall were plugged by welding a tapered plug at the tube ends.

Question

Would you please set forth the number of tubes in each steam generator that have been plugged?

Answer

Indications of corrosion of the steam generator tubing has led to the plugging of 1,929 tubes in the one generator and 1,744 tubes in the other. Each steam generator initially had approximately 8,500 unplugged tubes. At this time, approximately 22% of the tubes are plugged and thus unavailable to transfer energy from the nuclear core for conversion to electrical energy by the turbine-generator. The number of tubes plugged is shown below:

	<u>"A" S/G</u>	<u>"B" S/G</u>
Before Fall 1973	719	695
Balance 1973	297	49
Summer 1974	730	186
February 1975	81	205
February 1976	102	609

The plugging of tubes has not yet resulted in a loss of ability to generate at rated power levels. However, any significant additional tube plugging will result in a derating of the Plant's power production capability.

Question

Would you set forth whether Consumers Power believes that additional tubes would be required to be plugged at subsequent inspections and, if so, the number of tubes?

Answer

Based on our prior experience, we expect that continued tube plugging in the range of 500-1,000 tubes at inspection periods starting in August, 1977 and continuing at a frequency of about 18 months will be required unless corrective actions can be taken to reduce corrosion rates and alternate repair methods can be developed.

Question

What effect would plugging 500 to 1,000 tubes at each inspection have on the power output of Palisades?

Answer

The effects of plugging these additional numbers of tubes will cause unit derates in the nominal amount of 5%/year. The plugging of large numbers of additional tubes reduces the steam generation capacity of the units and thus reduces the amount of electrical energy produced. It is estimated that generating capacity is reduced by 0.75% for every 100 tubes plugged.

Question

Does Consumers Power Co currently have underway any efforts to minimize the number of steam generator tubes now expected to be plugged at subsequent inspections?

Answer

In addition to the efforts previously described, which will continue, Consumers Power has underway a number of programs which have the potential to minimize the number of tubes plugged at subsequent inspections. These efforts are designed to provide adequate insurance that tube integrity can

be maintained under postulated accident conditions. For example, a condensate polishing system capable of full-flow operation is being engineered and installed. Its operation will drastically reduce additional sludge buildup. Initial operation of this system is scheduled subsequent to the August, 1977 outage.

A feedwater recirculation line is being installed. This line will operate in conjunction with the condensate polishing system to drastically reduce sludge input to the generators during startup. Operation of this system is scheduled to commence following the August, 1977 outage.

Feedwater makeup and storage capacity is being increased to permit greater rates of blowdown for longer time periods. This additional capacity is scheduled to be available following the August, 1977 outage.

Presently, tubes with more than specified amounts of wall thinning are plugged. A method of repair is being simultaneously investigated and developed. This new technique is called "sleeving". For this method of repair, inconel sleeves approximately one foot long are installed inside steam generator tubes by hydraulically expanding them slightly at the ends. The sleeves are positioned so as to cover corroded areas of the tube. It is believed that once sleeves are in place, significantly greater wall loss will be permitted before tube plugging is required. Fourteen such sleeves have been installed in one of the Plant's steam generators on an experimental basis. The success of the sleeving development program would mean the plugging of much fewer tubes. However,

it is too early to judge this as a possible repair method.

Question

Based on your current knowledge, have you determined the down time required to conduct the inspection and repairs necessary to operate Palisades at or near its rated capacity?

Answer

The next inspection of the steam generator tubes is scheduled for August of 1977. Subsequent inspections are scheduled at successive refueling outages. An outage of 90 days duration is anticipated in order for the required inspections to be performed and repairs to be accomplished.

However, it is possible that extended outages of 6-12 months' duration will be necessary to perform repairs, inspections and take other actions to extend steam generator lifetime in even a derated mode. Such extended outages would be necessitated by events such as tube sleeving, tube sample removal and examination, tube and sleeved assembly inspection, tube plugging, tube unplugging, chemical and mechanical cleaning.

Question

Based on your efforts to date, have you reached a decision as to your ability to maintain Palisades at or near its rated capacity without protracted forced outages?

Answer

Of the activities and programs described, some are complete and their impact on steam generator performance can be ascertained. Others are not

yet complete and their effect cannot be judged except in probabilistic terms. Due to existing uncertainties such as the rate of corrosion and the success of projects such as sleeving, Consumers Power determined that it was prudent to plan for the plugging of additional tubes at each successive inspection period and the anticipated consequences of this action.

Question

As a result of this conclusion, what plans has Consumers Power Company made for the continued operation of Palisades?

Answer

Due to the possibility of protracted outages and continual derates, it was necessary to study and plan for the repair of the existing steam generators by retubing or replacement. Preliminary studies of these two options have been completed and both are presently considered viable.

Depending on the option selected, Consumers Power's preliminary plan indicates that after completion of final design, approximately two years of actual construction time will be required for implementation. This planning is continuing in parallel with the efforts previously described above to minimize the number of tubes plugged. As new information becomes available, it will be factored into Consumers Power's determination as to the appropriate action to be taken with regard to the steam generators at Palisades.

MR. CHERRY: Mr. Chairman, when you said there being no objection, my no objection was on the assumption that you were overruling my earlier objection.

CHAIRMAN COWLEY: That's correct, Mr. Cherry.

Dr. Leeds has a problem with the competence of Mr. Noble to testify to this particular point, which would be voir dire questions and would ordinarily precede cross on the testimony itself.

Does anybody else have any voir dire questions that they would like to ask related to that sort of thing?

MR. CHERRY: I'll defer to Dr. Leeds.

CHAIRMAN COWLEY: You're not making any friends up here, Mr. Cherry.

MR. CHERRY: Yes, but Consumers loves me.

VOIR DIRE EXAMINATION

BY DR. LEEDS:

Q Mr. Noble, before I start, let me ask you: Have you testified in proceedings before?

A No, sir.

Q Has your attorney -- and I'm not trying to break any attorney-client privileges here. Stop me if I ask questions improperly. Has he explained to you the qualifications of an expert witness by which, for example, a person might be an expert but in the area in which he is trying to testify may not be qualified as an expert in that specific

area. Has he discussed that with you?

What I'm trying to say is I'm not trying to embarrass you on the question of competence in your field. What I'm worrying about is the particular areas that you're testifying with respect to. Has he discussed this with you?

A We have discussed the issue of the calculations that were done to establish the derate. We discussed it. I did not perform those calculations.

Q I understand from your testimony here that you are a metallurgical engineer.

A Right.

Q On page 2 of the exhibit indicated -- maybe I'm misreading it -- that you've been a direct participant in the Palisades steam generator effort. But your primary duty there was as a metallurgist, is that correct?

A That was my duty during the year 1974.

Q Okay.

A Subsequent to that I assumed a different position in the company, the position of supervision over others who perform other duties were widespread than just materials engineering.

Q Well, tell me what operational services are. I guess that's the thing we're talking about, right?

A This is a group of engineers in Consumers Power Company that provide technical administrative services to

operating plants, including nuclear plants.

Included in the services are mechanical engineering services, and included within those mechanical services would be thermohydraulic, thermodynamic competence of the engineers on staff.

Q So, in other words, basically your group, then, does these calculations, the calculations with respect to thermal ratings of power plants, thermal ratings of steam generators?

A That is correct.

Q Thank you.

CHAIRMAN COUNELL: Mr. Hoefling, do you have any questions?

MR. HOEFLING: No questions, Mr. Chairman.

CHAIRMAN COUNELL: Mr. Cherry?

BY MR. CHERRY:

Q Would you describe the D&B calculation?

A I did not perform the D&B calculation.

Q Would you describe it, the one that is used in making the judgment in this testimony?

A It is a calculation which is performed to satisfy nuclear safety conditions. D&B is departure from nuclear boiling, and it is a requirement to look at the linear heat generation rate of the fuel and nuclear core be kept low enough so that there's adequate margin so that the film

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boiling condition does not exist.

Q State the equation, please.

A I don't know the equation.

Q What heat transfer values were used in connection with your testimony?

A The heat transfer values used were the values for the inconel tubing in the steam generators, inconel-600.

Q What were they?

A I don't know.

Q You don't know what values were used?

A I don't know what specific numbers were used, no.

Q Then you agree with me that you do not know and cannot tell me what heat transfer values were used?

A I don't understand your question totally. I understand what assumptions went into the thermodynamic calculations that were performed by engineers in Consumers to arrive at what possible derate the plant could suffer from additional plugging of steam generator tubes.

One is the heat transfer coefficient for inconel tubing, which is a number which appears in a handbook of some sort; but I do not know that specific number.

Q Can you tell me how that number, whatever it is, is different, if it is, from the one that was used most recently by Consumers Power Company computing the same mathematical equations in connection with its submission for the

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full-term operating license to the Nuclear Regulatory Commission?

A. I'm not intimately familiar with those calculations necessarily, but I would presume --

Q. No, I don't want you to presume. Your counsel may ask you to guess, and I'll object; but I don't want you to tell me if you don't know. Do you know?

A. I'm not familiar with the full-term operating license calculations, because they're safety calculations and not performed in my group.

Q. But there were calculations made, were there not, in the operational figures concerning Palisades which were recently submitted to the Nuclear Regulatory Commission dealing with the level of operation which, albeit has a relationship to safety, is nonetheless a determination of the output of the plant given certain problems.

I want to know if you can tell me if the heat transfer coefficients or values used in the calculations in your proposed testimony are different from those recently submitted to the NRC and, if so, how?

A. I cannot tell you that, because I have not reviewed the calculations which were performed for that full-term license submittal.

Q. But you will agree with me that what you told the NRC in order to get the operational license is inconsistent

with what you are about to tell this Board?

Q. Would you repeat your question, please?

A. I said would you agree with me that the filings you made to the Nuclear Regulatory Commission recently in support of a full-term license for Palisades, that those filings contained questions on heat transfer and D&B which are different from that you are about to tell the Board?

MR. BENTON: I object until we find out what time area he's talking about, Mr. Chairman.

MR. CHERRY: The most recent filing.

MR. BENTON: Thank you.

THE WITNESS: I could not agree nor disagree, because I did not review that submittal and the calculations in that submittal.

BY MR. CHERRY:

Q. Can you discuss in a little-- I'm just wanting to know if you are capable of discussing in detail -- the relationship to the operability of the emergency core cooling system and the integrity or degradation of steam generator tubes?

MR. BENTON: Objection, Mr. Chairman.

First of all, I think it's vague. Second of all, I don't believe, as I've said to you before, that the question of safety is before the Board.

Questions as to application of degradation limits

are, but not the safety questions.

MR. CHERRY: This is just voir dire. I just want to know if he's in a position to discuss that. I'm not going to ask him at this point any questions about it.

CHAIRMAN COOPER: I thought you said you didn't have any questions on voir dire; you were going to let Dr. Leeds do it.

MR. CHERRY: I said I was going to defer to Dr. Leeds, meaning I'd let him go first, but the Staff proceeds to in cross-examination.

I have this question. I regard this as voir dire, at which point I'm going to make a motion. So I would like to have this answered.

(The Board conferring.)

CHAIRMAN COOPER: The objection is overruled.

MR. BENTON: Can we have the question repeated, please?

BY MR. CHERRY:

Q Do you remember the question, Mr. Noble?

A No, sir. Would you repeat it?

Q Are you in a position to discuss in some detail the relationship between the operability of the emergency core cooling system and steam generator tube problems?

A I believe so.

Q You are.

MR. CHERRY: Mr. Chairman, I would move as conditional ground for Mr. Noble's testimony on the grounds that, while normally a witness that has a particular section is entitled to produce testimony that is done by people under his control, it is only when that witness can also deal with the subject matter; and it is not permitted under the rules to have a supervisor testify if he can't deal with the underlying facts.

In other words, it solves the hearsay problem so that you don't have to get a lot of people together to testify, but it doesn't solve the cross-examination problem, so that the supervisory personnel can only testify as to testimony and get it in if he is competent and capable of dealing with the testimony, albeit it was performed by other people.

The answer to his questions is he does not and cannot cause the relevant equations; he does not know what heat transfer coefficients and values were used, so there is no way with this witness to get to the underlying substance.

I think this is just another imposition by Consumers Power Company to give us a witness on a subject, which I think is irrelevant to a suspension hearing, who is not in a position to answer questions so that I will be forced to say, "I want someone else," and then the situation which I described in my letter will go on.

I do not believe this witness should be able to

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testify.

MR. RENFROW: I didn't put this witness on, Mr. Chairman, to testify or respond to questions concerning other calculations done for some other area.

He said he is familiar with and knows the assumptions that were made that went into the calculations for this particular area and that he can testify to that; therefore, he is qualified to testify to that.

DR. LEEDS: Well, let me ask him a couple of questions, because I'm still having a problem with this.

MR. RENFROW: Certainly.

BY DR. LEEDS:

Q Would you tell me what assumptions were made to come up with the 5 percent per year, or I guess more pertinent the .75 percent per hundred tubes plugged number? What was done to determine that number?

Is there a problem, Mr. Renfrow?

MR. RENFROW: In a way there is, Dr. Leeds. I'll just be quiet and let him answer the question.

DR. LEEDS: If you have a problem, I want to know what your problem is with my question before we get the answer, because I don't want it to come up later.

MR. RENFROW: The problem I have with your question is that the .75 has nothing to do with what Mr. Cherry has been talking to, but that's okay. He can handle that one

all

and that will be the other half of it.

DR. LEEDS: I may get to the other one in a minute.

THE WITNESS: The assumptions that went into the calculations that were performed included the present secondary system pressure and temperature. They included the fact that the turbine inlet valves were essentially wide open and could not be opened further to pass additional steam, even if the same secondary system pressure were maintained.

They included the thermal efficiency parameters, which are in a collection of information called the turbine thermal kit, which comes with the turbine generator. It's data supplied by the manufacturer on the performance of that turbine to permit you to perform heat balance calculations across various points.

It was assumed that the heat transfer coefficient of the inconel tubes remained constant, and it was assumed that the steam generator condition was a limiting condition of the plant, which it is.

At that point, then, these thermal values, thermal kit values, were used with the existing pressure and temperature, and that pressure and temperature in the secondary system was degraded with the plugging of additional tubes because of the removal of heat transfer surface with

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the plugging of additional tubes.

Q Does flow through the tubes on the primary side have anything to do with it?

A It has an input to it, yes.

Q In what way?

A Well, it has a very minor input in the sense that-- to this calculation that we're talking about now, because flow through the primary system has an input to nuclear safety parameters, which is an influence in LOCA calculations and D&B calculations.

Q Does the flow through the primary tubes on the primary side have anything to do with heat transfer coefficient?

A No.

Q None?

A I would not say none, but no major effect.

Q How much -- what effect does plugging of the number of tubes have on the flow through the primary side? Does that affect the flow?

A Yes, sir, it does.

Q How? What's the mechanism?

A It increases the pressure resistance or the pressure drop on the primary system, so that the primary coolant pumps are pumping against a greater resistance and thus increases the flow.

Q Now, if I asked you could you tell me how you

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calculated or has your people calculated the .75 percent?

A. Yes with number by number, equation by equation. We had some enhancement your question.

Q. At this point I would like ask you to tell me Equation No. 75 in Book No. 21 of somebody's manual on how to calculate things, but tell me what kind of things are involved in calculating the .75 percent.

A. Starting with the steam generator, plugging additional tubes increases heat transfer surface.

Q. What does that do?

A. Using the heat transfer coefficient times the surface area times time, there is a lower number of BTUs and less energy transferred from the primary system to the secondary system.

Q. What happens to temperature?

A. The temperature tends, in the secondary system, tends to drop and the pressure tends to drop.

Q. Does log mean temperature mean anything to you?

MR. KENNEDY: I'm sorry, Dr. Leeds. I didn't hear all of that question.

DR. LEEDS: Log mean temperature.

THE WITNESS: Not necessarily.

DR. LEEDS: Thank you.

(She heard conferring.)

CHAIRMAN COOPER: Do you have a pending motion,

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Mr. Cherry? I've forgotten what it was.

MR. CHERRY: I move to strike the testimony which was received in evidence on the basis of relevance on the grounds that the voir dire has established that this witness is not competent to testify or explain the conclusions or the basis therefor reached in his testimony.

CHAIRMAN GOSPEL: Do you want to be heard on that, Mr. Renfrow?

MR. RENFROW: I'd like to ask Mr. Noble a couple of questions in response to the voir dire questions.

BY MR. RENFROW:

Q Mr. Noble, you talked to Dr. Leads about the .75 percent number. Will you just state which calculations are used to reach that number?

A Which calculations are not nuclear safety calculations? The thermodynamic calculations.

Q Those were the calculations discussed with Dr. Leads in the first part of his questions?

A That's correct.

Q Now, would you tell the Board if you used the nuclear safety calculations, first, what those are, and what the resulting number is.

A Nuclear safety calculations that have been performed at Consumers are D&B calculations. They have been performed for a variety of number of tubes plugged and for

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a variety of resultant primary system flows.

It shows that if a thousand tubes are plugged, for instance, that the resultant decrease in output of the plant would be 10 percent, all other factors remaining constant, that is, the secondary system parameters.

The LOCA calculations for the plugging of a thousand additional tubes -- that's a thousand in addition to those that are currently plugged -- are in the process of being performed, but they have not yet been performed; however, in the past when DAB limits and LOCA limits have been compared they have been approximately the same.

So at this point the assumption is made that the LOCA limit would be in kind with the DAB limit with the resultant power reduction of approximately 2 percent.

BY DR. LEADS:

Q. You say the calculation was made for a thousand tubes, and what was the decrease?

A. 10 percent -- no, excuse me. I have to correct my statement. It was a thousand tubes per outage. It was 10 percent in four years. The outages are assumed to occur at approximately 15-month intervals.

MR. REMEROW: Let me ask one question.

BY MR. REMEROW:

Q. The number 2 or 2 or 3 percent that you gave Dr. Leads, will you explain to Dr. Leads what that number is,

please?

A. Okay.

The equivalence of the 10 percent over a period of eight years, if you plug a thousand tubes at each interval, is about 2 1/2 percent.

We have assumed, because of the amount of continuing corrosion that has taken place in the operating periods that we are having now between inspections, that we will be plugging between 500 and 1,000 tubes at each inspection. We've made that assumption for planning purposes.

So I've reasoned that you can downscale the 2 1/2 percent number to around 2 percent.

BY DR. LEEDS:

Q. 2 percent of what?

A. 2 percent of electrical output of the plant.

Q. Per how many tubes?

A. Well, the number for 1,000 tubes per outage is 10 percent in eight years, or a little over 2 percent per year.

Q. In eight years how many tubes will I plug?

A. You will have plugged something like 6,000 to 7,000 tubes.

Q. And there are only -- what? Eight thousand or so in the whole generator?

A. There are 3,000 to 3,500 tubes per generator

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prior to initial operation.

CHAIRMAN COUFAL: The Board is going to sustain Mr. Cherry's motion with regard to the competence of the witness to testify as to a good portion of what he has in his testimony, Mr. Remfrow, and strike it.

MR. CHERRY: Mr. Chairman, I would also just like to make certain that the testimony that this witness gave on voir dire is, while not stricken in the sense that it supports the Board's ruling, is not to be considered as evidence in this proceeding but was only asked for the purpose of determining a ruling on my motion to strike.

Is that clear, Mr. Chairman?

CHAIRMAN COUFAL: Any evidence that we have from this witness with regard to substantive matters will not be considered by the Board in arriving at whatever decision it arrives at.

MR. CHERRY: Thank you.

MR. REMFROW: I have two motions to make now, Mr. Chairman.

I now move, on the basis of your ruling, that either I be allowed to provide the exact witness who did the calculation -- and I want you to understand that he will not be able to testify to anything other than doing the calculation -- provide both of those witnesses. I will then replace Mr. Noble back on the stand with that information

18 having been provided so that he can then tell you what their planning was on that information.

If the Board refuses to allow me that motion, then I move this Board to strike all of Mr. Cherry's cross-examination as to Mr. Heins on the assumption of the Palisades steam generators.

MR. CHERRY: Mr. Chairman, I'd just like to be heard in response.

I think the motion to strike Mr. Heins' testimony is facetious, and I'll let the Board deal with that without any argument.

DR. LEEDS: It was cross-examination?

MR. CHERRY: The cross-examination.

I think it's facetious. I'll let the Board deal with that without any argument from me.

But, once again, if Mr. Randner wants to do something, let him do it. He is not proposing to do anything. He is asking you for an advisory ruling. You have already suggested what the relevance of testimony is. If he can't select the people that he believes are necessary to try his lawsuit, that's his problem.

I say that his motion is entirely out of order. I do not think it should be entertained whatsoever.

Licensees, applicants and utilities have got to learn sooner or later that the cocoon which has surrounded

them for so long may be open. If they want to try a lawsuit, then they bloody well try it and they don't go around asking the Licensing Board, "How much more do I have to give you before I get my license?"

It seems to me they ought to make up their own mind, and we'll deal with that subject when the motion is made or when the witness is presented or whatever. I don't think that this Board should entertain any advisory position.

It seems to me when it asks the Staff a question that's a little different, because the Staff has got an enormous responsibility in this case and the Staff might be able to ask for some guidance from the Board. But it's required to oppose the applicant without all of that kind of benefits, without the kind of resources, without the kind of funds. Let them make their own judgment.

If Mr. Wessal was here, I'm sure he'd support me in spades.

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1 MR. RENFROW: Mr. Chairman, I have a problem. We
2 have told this Board what it would require to go back to
3 each individual that did the calculation. I then I have
4 been told a number of times that that is not what this Board
5 wishes.

6 Now I will take Mr. Cherry's suggestion and I will
7 provide my case with the witnesses, pursuant this Board's
8 ruling, as to this witness who did the calculations and we
9 will go about doing that, Mr. Chairman.

10 DR. LEEDS: Are you withdrawing the motion

11 MR. RENFROW: At this point in time, I will with-
12 draw my motion.

13 DR. LEEDS: Both of them?

14 MR. RENFROW: Both of them.

15 CHAIRMAN COUFAL: Okay.

16 MR. CHERRY: Mr. Noble, you are excused.

17 CHAIRMAN COUFAL: Thank you, Mr. Noble.

18 (Witness excused.)

19 MR. RENFROW: I would like five minutes.

20 Can you tell me what we are going to do now?

21 CHAIRMAN COUFAL: We are going to do who ever is
22 available to put on.

23 Are you ready to go with Mr. Echols, Mr. Renfrow?

24 MR. TOURTELLOTTE: Yes.

25 CHAIRMAN COUFAL: I was asking Mr. Renfrow.

1 I know you are, Mr. Tourtellotte?

2 MR. RENFROW: Can I have five minutes?

3 CHAIRMAN COUFAL: Yes.

4 We will take five minutes.

5 (Recess.)

6 CHAIRMAN COUFAL: We are ready to proceed.

7 Go ahead.

8 MR. RENFROW: Mr. Chairman, in view of your ruling,
9 ing, I would like to move to delete on page 7 the question
10 and answer dealing with the number of tubes to be plugged.

11 I will represent to the Board that I will supply
12 witnesses with this information. However, the remainder of
13 the testimony goes to the metallurgy that Mr. Noble has
14 expertise in and cannot be provided by the witness who performs
15 the calculations required for that question and answer.
16

17 Therefore, I will make a motion at this time that
18 we strike that question and answer, and that any questions
19 on the remainder of the testimony that the parties, Mr.
20 Noble be allowed to answer questions to, so that he can be
21 excused.

22 I will provide you on Monday with a witness who
23 will then tell you what the percentage is of generation,
24 which would result from the number of tubes being plugged.

25 MR. CHERRY: I would oppose the motion. I don't

1 think that the elimination of that single question changes
2 any of the rulings that the Board has made.

3 MR. RENFROW: Again, Mr. Chairman, there has been
4 no question as to Mr. Noble's expertise in metallurgy and
5 resultant degradation of the tube. There has only been a
6 question as to the D & B calculations and the thermodynamic
7 calculations which he stated he has not made.

8 The remainder of that is directly applicable to
9 his testimony.

10 (Board conferring.)

11 CHAIRMAN COUFAL: The motion is overruled, Mr.
12 Renfrow. We will go on with Mr. Echols and you can put on
13 your case in order, whenever you get at it; the evidence with
14 regard to the steam generating tubes.

15 We don't feel that deletion of that question re-
16 moves all the problem.

17 MR. RENFROW: Okay.

18 MR. CHERRY: Mr. Echols?

19 MR. RENFROW: Excuse me, Mr. Cherry.

20 Mr. Chairman --

21 MR. CHERRY: Are we going to waste all morning on
22 this?

23 CHAIRMAN COUFAL: Yes, Mr. Renfrow?

24 MR. RENFROW: Can you indicate for me, then, those
25 portions of the testimony -- or perhaps we best do it by

1 motion -- I have tried to accommodate this Board and the par-
2 ties by bringing witnesses down here. I would like to be
3 able to finish with Mr. Noble so that he is not required to
4 come back to Chicago. I can do that, perhaps, if the Board
5 and the parties will indicate to me those areas which they
6 have difficulties with, with Mr. Noble's testimony.

7 I am stating I will accept the Board's ruling
8 while objecting to it, but that I would like to have at least
9 the ability to put him on the stand in those areas which his
10 expertise is not questioned on, and I will then provide the
11 other witnesses at a later time.

12 Thank you.

13 MR. CHERRY: Mr. Chairman, I think that is highly
14 improper.

15 CHAIRMAN COUFAL: Well, it is not practically
16 possible, Mr. Rensfrow, for the Board to go through this testi-
17 mony now and winnow out bits and pieces and patch it up.

18 It is unfortunate Mr. Noble has to come back, but
19 you have to come back.

20 MR. RENFROW: Fine, Mr. Chairman.

21 Let's go ahead and do Mr. Echols and that time,
22 after we finish with Mr. Echols, I will go ahead and state my
23 case.

24 CHAIRMAN COUFAL: Mr. Echols?
25

1 Whereupon,

2 F. S. ECHOLS

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

6 MR. CHERRY: I want it to be know that my silence
7 is not an indication of my agreement to any further testimony
8 on this subject at all.

9 DIRECT EXAMINATION

10 BY MR. TOURTELLOTTE:

11 Q Would you state your name, address and occupation,
12 please?

13 A Stan Echols, 10809 Bell Haven Boulevard, Damascus,
14 Maryland. I am an Environmental Project Manager for the
15 Nuclear Regulatory Commission.

16 Q And I show you a three-page document, the first
17 page of which contains the professional qualifications for
18 F.S. Echols and the subsequent two pages the NRC Staff testi-
19 mony by F.S. Echols.

20 (Handing document to witness.)

21 And I ask you, did you prepare those documents?

22 A Yes, I did.

23 Q And I ask you: Are they true and correct to the
24 best of your knowledge?

25 A Yes, they are.

barb6

1 MR. TOURTELLOTTE: I would ask that at this point
2 in time that this document be incorporated into the record
3 as if read.

4 CHAIRMAN COUTAL: Are there objections?

5 MR. CHERRY: Yes.

6 I will object to it on the grounds that it is
7 repetitive and redundant and obviously on its face, goes be-
8 yond the issues in this particular proceeding.

9 If you will note on page 2 of the testimony, the
10 Staff believes that a ten-month schedule was required for
11 the remanded environmental review. The Staff has suggested
12 that that ten-month schedule will begin in November 1976. It
13 is now February, '77. And I think it is safe to say that
14 there will be at least an additional month, perhaps at the
15 outside, but an additional month before we will be able to
16 get a beginning on a remanded hearing and maybe significantly
17 longer; maybe another 90 days or 120 days, no matter what
18 happens, would be a fair estimate.

19 Therefore, by the Staff's own admission in para-
20 graph last on page 2 of Mr. Echol's testimony, this witness
21 is not providing information that is based upon Staff cri-
22 teria. That information would have to go far beyond the ten-
23 month period set forth.

24 Accordingly, I move that the testimony be barred
25 as being inconsistent on its face as not being true and correct

1 as of today and as being in any event repetitive and redund-
2 ant of the Wall's testimony.

3 DR. LEEDS: All of it?

4 MR. CHERRY: Yes.

5 CHAIRMAN COUFAL: Do you have any comment, Mr.
6 Tourtelotte?

7 MR. TOURTELLOTTE: I really don't understand what
8 he sees there that is not true and correct. The first
9 date says, "Begin review." Has anybody asked the witness:
10 did they begin the review on that date?

11 The second date on there is says, "Issue DHS."
12 Has anybody asked the witness if that's the date?

13 If there is something that is not true or correct
14 about this testimony, Mr. Cherry has an opportunity to prove
15 that on cross-examination. It has nothing to do with the
16 admissibility of the evidence.

17 And as far as it being redundant or any other
18 complaint that he has, perhaps he can show that on cross-
19 examination.

20 It is valid testimony. It is admissible. He
21 is qualified. And there is no earthly reason why this Board
22 shouldn't hear it.

23 (Board conferring.)

24 CHAIRMAN COUFAL: Overruled, Mr. Cherry.

25 Is there other objection to the testimony?

barb2

1 MR. RENFROW: No.

2 MR. PRIDEA: No.

3 CHAIRMAN SCUFAL: The testimony captioned, "NRC
4 Staff Testimony of F.S. Scholz on the Environmental Impact
5 of Continued Plant Construction During the Next Year and
6 Environmental Review Schedule," is received and will be bound
7 into the record as though read.

8 (The document follows.)
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F. S. Echols

ENVIRONMENTAL PROJECTS BRANCH NO. 2

DIVISION OF SITE SAFETY AND ENVIRONMENTAL ANALYSIS

U. S. NUCLEAR REGULATORY COMMISSION

I am employed as an Environmental Project Manager with the Division of Site Safety and Environmental Analysis, U. S. Nuclear Regulatory Commission, responsible for managing and coordinating the review of Applicant's environmental reports, analysis and evaluation of environmental impacts of nuclear power plant construction and operation and the preparation of NRC Environmental Statements in accordance with the Commission's regulation, 10 CFR Part 51, which implements the requirements of the National Environmental Policy Act of 1969. At present, I am the Environmental Project Manager for the Clinton, Hartsville, Vogtle, Barton, Harris, Surry, Arkansas and Midland Nuclear Stations.

I was awarded a Bachelor of Science degree in Nuclear Engineering in 1969 from the University of Florida. I received a Master of Business Administration degree in 1970 and a Doctor of Philosophy degree in Environmental Engineering in 1973, from the University of Florida.

While in the doctoral program majoring in Health Physics, I was employed to conduct a radiological field study of a Nuclear Power Plant. My doctoral research was conducted at the Oak Ridge National Laboratory, where I studied the differential chemoprotection of radioprotective drugs on normal and malignant tissues in various types of radiation fields.

From 1973 to 1974, I worked for an architectural engineering firm as an Environmental Project Engineer. I was responsible for the coordination and production of the Applicant's environmental reports and, in that two-year period, I completed reports for four utilities and also contributed to the PSAR effort on each with special attention to site suitability. During this period, I also taught evening courses in the Business Administration Department, Montgomery College.

In 1974, I accepted my present position as an Environmental Project Manager. I am a member of the American Nuclear Society, the Health Physics Society and the International Association for Pollution Control.

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)

}
} Docket Nos. 50-329
} 50-330

NRC STAFF TESTIMONY OF F. S. ECHOLS
ON THE ENVIRONMENTAL IMPACT OF CONTINUED PLANT CONSTRUCTION
DURING THE NEXT YEAR AND ENVIRONMENTAL REVIEW SCHEDULE

Having both visited the site on October 20, 1976 and discussed construction practices and schedules with NRC personnel from Inspection & Enforcement as well as personnel from Consumers Power Company, I conclude that although the Midland Plant, Unit Nos. 1 and 2 are less than 20 percent complete, virtually all impacts upon the environment, due to construction, have occurred. The cooling pond has been constructed and the last remaining riprap is being placed on the slopes; equipment lay down areas are completed and in use; the sewage pipe line to Dow Chemical is nearly complete as is the water pipe line from Midland; the rail line is complete; county drains have been relocated; the preparation of the river shoreline for the intake structure is nearly complete and riprap is in place, dredging has been completed; water runoff control practices are in effect; all spoil material is being used on-site for dike construction and diversion of surface runoff; grass seeding of banks has been done and is to be repeated if a washout occurs; the batch plant is in operation with stack filters in use; road watering is used when needed to reduce road dust; screening techniques have been employed to reduce visual impacts to nearby residents.

Construction activity for the next year will be in the immediate area of the reactor complex where land has already been completely altered and control procedures employed. Such activity includes concrete placement and earthwork, such as grading, excavation and backfilling. The environmental impacts due to construction expected during the next year are the normal traffic and noise associated with the project. Virtually all impacts to the environment as a result of construction have occurred. No significant adverse impacts upon the environment are expected to occur in the next year due to construction of the Midland Plant, Unit Nos. 1 and 2.

Environmental Review Schedule for Midland Plant, Units 1 and 2

The Staff believes that a ten month schedule, from November 1, 1976, will be required for the remanded environmental review of the Midland project. It should be noted that portions of the schedule are fixed by 10 CFR Part 51, e.g., 45 day comment period after CEQ Federal Register Notice is published, and a minimum of 30 days between issuance of FES and beginning of hearing. The projected review schedule is as follows:

November 1, 1976	Begin review
January 15, 1977	Issue DES
January 21, 1977	CEQ Federal Register Notice
March 7, 1977	End Comment Period
April 29, 1977	Issue FES
June 1, 1977	Hearing begins
August 1, 1977	Proposed Findings
September 1, 1977	ASLB Decision

barb9

1 BY MR. TOURTELLOTTÉ:

2 Q Could you summarize your testimony in a couple of
3 sentences, Dr. Echols?

4 MR. CHERRY: I object to the question. It is now
5 in the record as if read, and I don't think that the necessity of
6 summarizing a page and a half in a couple of sentences is
7 either meaningful, worthwhile, or cetera.

8 MR. TOURTELLOTTÉ: Mr. Chairman, Mr. Cherry has
9 been a party to these proceedings before. He knows full well
10 that in virtually every NRC proceeding that we have there is
11 a custom of having the witness review his testimony in a
12 summary fashion for the benefit of those who are sitting out
13 in the audience who may not have the opportunity to read it.
14 That's the only reason that I ask Dr. Echols to do that. I
15 think it is in keeping with the practice we have established
16 in the NRC.

17 CHAIRMAN COUFAL: Well, I think the Board has
18 asked for it in this case before from other witnesses.

19 That is overruled, Mr. Cherry.

20 MR. CHERRY: The only custom I know of about the
21 NRC proceedings is they don't do their work independently.

22 MR. TOURTELLOTTÉ: I object to that and I ask that
23 counsel be admonished right now.

24 CHAIRMAN COUFAL: You two don't get along very
25 well, and I suggest, Mr. Cherry, in fact, I order, Mr. Cherry

1 for you to keep your comments to yourself, please?

2 BY MR. TOURTELLOTTIE:

3 Q Would you summarize, please, in a couple of sen-
4 tences, if you can?

5 A Yes.

6 Virtually all of the impacts associated with
7 construction have occurred at the site, and no significant
8 adverse impacts are expected in the remand period.

9 MR. TOURTELLOTTIE: I have no other questions.

10 CHAIRMAN COUFAL: Mr. Cherry?

11 MR. CHERRY: I think Consumers goes first on the
12 schedule.

13 CHAIRMAN COUFAL: All right.

14 Mr. Renfrow?

15 MR. RENFROW: I have no questions, sir, of
16 Mr. Echols at this time.

17 CROSS-EXAMINATION

18 BY MR. CHERRY:

19 Q What utilities did you work for?

20 A What utilities did I work for?

21 Q Yes. You said that you worked for an architect-
22 ural engineering firm as a project engineer and you completed
23 reports for four utilities. I want to know who those were?

24 A When I was working for the AE --

25 Q What AE was it?

b11

1 A That was Bechtel, Gaithersburg, in 1973; I worked
2 on the SNUPPS project and I worked on the environmental re-
3 ports for those utilities in the SNUPPS project. Those
4 were Wolf Creek, Tyrone, Sterling - I don't recall the name
5 of the fourth. It was near St. Louis.

6 Q Those aren't utilities. Those are plants. Can
7 you tell me the names of the utilities?

8 A Those are plants. Kansas Gas and Electric was
9 for Wolf Creek. And it has been some time, really working
10 with those utilities. I didn't work directly with the utili-
11 ties. I did my project --

12 Q Tyrone is Northern States?

13 A That's correct.

14 Q And the Sterling plant?

15 A I am going to have to check on that.

16 Q You don't know?

17 A I would have to check.

18 Q How long did you work for Bechtel?

19 A About a year and a half.

20 Q At the time you were working for Bechtel, did
21 Consumers Power Company have contracts by which Bechtel
22 profited from?

23 A Not to my -- well, I think while I was there they
24 started up the Ann Arbor office. I remember some discussions
25 about that. That's the extent of my knowledge.

barb12

1 Q Bechtel is the architectural engineer in the
2 Midland case; isn't that correct?

3 A That's correct.

4 Q And hasn't Bechtel been working for Consumers
5 Power Company during the period of time you worked for
6 Bechtel?

7 A Bechtel; yes. The Gaithersburg office wasn't.
8 You have individual pocket centers of Bechtel --

9 Q I am talking about the company.

10 A That's correct.

11 Q And during the period of time you worked with
12 Bechtel, Consumers Power Company also had the Palicades gen-
13 erating plant contract with Bechtel; is that correct?

14 A I don't have any direct knowledge of that.

15 Q You have been sitting in on a good deal of these
16 proceedings, have you not, Mr. Echols?

17 A That's correct.

18 Q What witnesses have you heard testify?

19 A Mr. Wells and I believe Mr. Kaeley. I would have
20 to take a look at the list because I wasn't in for --

21 Q Mr. Heins?

22 A I don't recall. What was his subject? If it
23 had to do with, say, need or cost, I wasn't in here. We
24 had people coming back and forth for these hearings.

25 Q Mr. Temple?

rb13

- 1 A Yes.
- 2 Q You heard him testify?
- 3 A Yes. Some -- I don't think I have heard the com-
4 plete testimony of Mr. Temple.
- 5 Q Mr. Orrifice?
- 6 A Yes, again in parts; in and out of the room; yes.
- 7 Q Mr. Lapinski?
- 8 A I may have. I don't know. As I said, when I
9 come in I sometimes don't get the name of who is up here.
10 I have heard bits and pieces of lots of people.
- 11 Q What exactly is your position in connection with
12 this project?
- 13 A I am the Environmental Project Manager.
- 14 Q You are in charge of supervising the environmental
15 review for the Midland project?
- 16 A Yes.
- 17 Q And when you say environmental review, I take it
18 you are using that term, your understand of that term, pur-
19 suant to the Nuclear Regulatory Commission's obligations
20 under the National Environmental Policy Act?
- 21 A That's correct.
- 22 Q Is your testimony to be construed as if there were
23 no adverse impact from continuing on under any of the matters
24 that are covered, or required to be covered, according to your
25 understanding, under the Environmental Policy Act?

Ab1.4 1 A For the purpose of this hearing? My testimony is
2 for the purpose of this hearing, defined for that space
3 we would have -- if there would be a suspension period, what
4 are those effects in that suspension period. That is dif-
5 ferent, I think, from the remainder of the project as a
6 whole.

7 Q Do you believe, Mr. Echols, that in making an
8 environmental review, you have to look at alternatives?

9 A Yes.

10 Q And when you make the statement that there are
11 no adverse environmental effects, I assume that that includes
12 the statement that there will be no reasonable foreclosure of
13 alternatives?

14 A That's correct.

15 Q Have you come to the conclusion that between now
16 and the period of time your testimony covers, there will be
17 no foreclosure of alternatives?

18 A To the proposed project? Yes.

19 Q What are the alternatives that you considered as
20 the subject of your testimony?

21 A The Staff has considered the alternative to the
22 proposed project, a 1500 megawatt fossil facility that also
23 generates steam.

24 The Staff has also looked at alternatives to the
25 proposed facilities such as MHD, solar, wind; this type of

Ab1F

1 thing.

2 Q But all of the alternatives have included a plant
3 capable of producing both steam and electricity by Consumers
4 Power Company to be built in Midland?

5 A To date, the Staff testimony that is to be pre-
6 sented on the alternatives, the most significant -- the
7 reasonable, the only reasonable alternative that the Staff
8 has looked to date to the proposed facility, I think, is
9 the 1600 megawatt coal facility that also generates steam.

10 And the Staff is continuing at this time to look
11 at other alternatives to the facility that would not include
12 that, whether considered reasonable or not.

13 Q What is the total megawatt capability of both
14 Midland nuclear units?

15 A I think their design is 1600 megawatts; two 800
16 megawatt units.

17 Q You are certain of that?

18 A Well, are you saying minus the steam? I mean,
19 part of that power is going to be to generate steam as de-
20 signed. Presently proposed, there are two 800 megawatt
21 plants.

22 Q Are you sure of that?

23 A Within that significant figure; it could be 800
24 and something; yes.

25 Q How is it your testimony that the only reasonable

rb15 1 alternative that you presently believe that you should con-
2 sider in connection with foreclosing alternatives is either
3 to build two 800 megawatt nuclear plants or two 800 megawatt
4 fossil fuel plants with coal capable of producing both
5 electricity and steam?

6 A I don't think that is quite what I said. Let
7 me back off. The Staff has, at this time, has testimony to
8 present on the alternative of a 1600 megawatt fossil unit
9 that has the same capability of the proposed project.

10 Because in these proceedings and in reviewing
11 testimony of the Applicant and Dow, and information that we
12 are always gathering, we are continually studying alternatives.
13 We haven't foreclosed any that we are going to look at.

14 We are presently looking at alternatives such as
15 Dow's generating their own steam, reduced capability of the
16 Midland nuclear plant. All of these are ongoing. We are
17 still doing them. They aren't completed.

18 I would say, given the present state of events,
19 that; yes, probably -- well, no -- yes, I would say yes; the
20 most viable alternative presently considered by the Staff
21 is the 1600 megawatt fossil unit with the same steam cap-
22 ability.

23 Q That is based --

24 A That is not to say that we are not looking at
25 others, and we would certainly present those.

Ab17

1 Q Now you said, given the state of events, the most
2 viable alternative is the coal plant. Are you including all
3 of the testimony you heard from Mr. Orrefice, Mr. Temple,
4 Mr. Heins, Mr. Wells?

5 A Yes.

6 Q You don't consider that the testimony about the
7 Dow-Consumers Power Company dispute at all impinges upon your
8 statement, that the most viable alternative is an 800 mega-
9 watt coal plant?

10 A Now, what I said sooner is; because of the testi-
11 mony given orally in this proceeding and the testimony that
12 was given -- that was written testimony that we looked at
13 and because of the questions we might have had and asked of
14 the Applicant and others, and other materials we reviewed,
15 we are looking at other alternatives.

16 But yes, right now the most reasonable alternative
17 to the proposed facility, I think, is still the 1600 mega-
18 watt fossil unit and the steam produced from it.

19 End 3
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Q What other alternatives are you looking at, and what testimony that you learned in these proceedings prompted you to look at that alternative?

A It is hard to say which particular information generated an interest in which particular alternative.

But we are looking at the Dow proposals on their costs and feasibility and schedules on generating their own steam and electricity --

Q When did you first become interested in --

MR. FOURBES-OTTE: Mr. Chairman, could the witness finish his answer.

CHAIRMAN COUFAL: Were you finished, Mr. Bohler?

THE WITNESS: No, I was not.

CHAIRMAN COUFAL: Go ahead.

THE WITNESS: -- looking at their proposal.

We are looking at our own assessments to compare it to that proposal to see what our determination is as to the reasonableness of scheduling and costs.

We are looking at a 1300 megawatt fossil unit. I think we are looking at -- we have looked at 600 megawatt fossil unit costs and schedules. That is not to say we are making any judgments as to whether they are realistic or not. It is simply that it is incumbent upon us to look at them.

BY MR. CHERRY:

Q Have you completed the review of the other alternative?

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which have been prompted by the oral testimony in this proceeding?

A I think the answer to that is no, although I think we have some preliminary conclusions based on what information we have now. But an ultimate conclusion, I don't think we have.

I think we can -- once we -- I am sort of getting into what other people are going to be discussing in their testimony. And since I am not the expert alternatives, their costs or their schedules, I am only aware of them as to my position as a project manager in keeping my finger on what is going on. What I think sufficient information is available so that when that testimony is given we may be able to make some ballpark kind of conclusions that given built-in conservatism we can make some judgments upon.

What I am saying is, we may not have all the data to do a complete assessment, but we can make conservative assumptions and reach a conclusion that we think may not be changed by getting the remainder of the data.

We need to make an assessment.

Q How long will it take you, in your judgment, to make a complete review of the alternatives that have been prompted by the cross-examination in this proceeding?

A I think we can give a relatively good assessment of the alternatives with conservative assumptions built in,

that we think will hold up --

Q That is not my question.

A --- within the time period that people were discussing for this hearing.

Q That is not my question.

You told me that in order to account for the fact that you haven't done your complete review, you are going to make what you determine is a conservative assumption.

My question is, how long will it take you to do a complete review without making assumptions at all, but gathering all the information that you can and making the analysis as to those alternatives which have been prompted for review by the Staff pursuant to the cross-examination in this proceeding?

How long will it take?

A That is sort of a two-part answer, if you will bear with me.

The first part is, I think there is a chance, a reasonable chance that we may be able to do that within the timeframe. I can't give you a definitive answer on that. But there is a possibility that even the detailed analysis may be done.

The second part I would like to say, is that we can make a conclusion, a reasonable conclusion about foreclosure of alternatives without doing that, with the conservative

mr:4

assumptions we have built in. I think we can state whether some alternatives are reasonable or not, and whether they would -- whether those would be -- we consider to be reasonable would or would not be foreclosed by a suspension.

Q Please answer my question as to how long you presently believe it will take to complete the review of those alternatives which you now deem necessary to review as the result of the cross-examination?

How long you estimate, as project manager, it would take you to complete that review, Mr. Echols?

A That I deem necessary?

Next week.

Q Okay.

MR. CHERRY: I take it I may be longer than one o'clock with this witness.

BY MR. CHERRY:

Q Mr. Echols, how long would it take for a Regulatory Staff member who was ordered, without political overtones, to do an honest review?

MR. TOURTELLOTTE: I object to that question, Mr. Chairman.

MR. CHERRY: May I finish the question?

CHAIRMAN COUFAL: Finish the question.

MR. TOURTELLOTTE: I think the question has -- already has a --

run5

CHAIRMAN COUFAL: All right.

Let him finish. If it does, we will handle it.

MR. CHERRY: The rules, Mr. Tourtellotte, is to let a question be finished, and then you object.

MR. TOURTELLOTTE: Not if you place within that question, an insulting phrase. And you have done that, sir.

CHAIRMAN COUFAL: Go ahead, finish the question, Mr. Cherry.

BY MR. CHERRY:

Q How long will it take for a Regulatory Staff member without political overtones, to do a detailed review of each of the alternatives under this -- that have been prompted by the cross-examination, without substituting conservative assumptions for the detailed work?

MR. TOURTELLOTTE: Now I object.

CHAIRMAN COUFAL: All right.

Strike "without political overtones," and answer the question.

BY MR. CHERRY:

Q Insert the word honest.

A Okay.

You are not interested in the total length of time to do it, you are interested in the end date, is that correct?

Because these things have been ongoing and I

couldn't really give you a start-to-finish man hours kind of projection.

But I think what you want to know is, can the detailed analysis be completed by a certain date, and give you that date?

Q I want to know when you think it will be done, without this assumption business.

A Okay.

MR. TOURTELLOTTE: Mr. Chairman, I would like to point out that there has been no question asked of this witness as to whether any such forecast necessarily can eliminate all assumptions.

I think it is a fairly standard practice both in engineering, mechanical engineering if you will, environmental engineering to make certain conservative assumptions and to progress on that basis. And there is nothing wrong with progressing on that basis.

And I am not certain that in this case, asking this question of this witness will extract a relevant answer, since perhaps there will be assumptions for as long as we have evaluations.

MR. CHERRY: Mr. Chairman, would you instruct Mr. Tourtelotte the rules of this proceeding is that he makes an objection and then he may make a comment in support of that. But the rules of this proceeding do not permit him

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to get up and say -- what if I wanted to get up for example and say, the Regulatory Staff has been dishonest for the last seven years, he will jump up and say, blah, blah, blah, admonish. But now he seems to be following in the footsteps of a person, namely myself, that he doesn't seem to respect.

So, what I want to do is have Mr. Tourtellotte follow his own rules and regulations that he sets down for others, and he hasn't made an objection and I don't think it is appropriate.

I mean, I am not just pleased by the sound of his voice.

CHAIRMAN COWFAL: Mr. Tourtellotte, when you do rise, state your objection.

The advice that I found in what you said, might be construed to be an instruction to the witness.

MR. CHERRY: Consider yourself admonished.

MR. TOURTELLOTTE: I have an objection, Mr. Chairman, that the question as posited can not elicit a relevant answer since the appropriate basis for such a question has not been laid.

CHAIRMAN COWFAL: Overruled.

Go ahead, answer if you can, Mr. Echols.

THE WITNESS: Will you repeat the question?

BY MR. CHERRY:

Q Yes.

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I think this is now the second time I have asked the project manager just to tell me simply how long it will take to complete a detailed review, without substituting assumptions, where you were able to get the facts if you go after them, of each of the alternatives that you believe now are necessary to analyse as a result of the cross-examination in this proceeding.

A I haven't discussed with the people conducting the analysis how long it will take them.

And I haven't -- I have gotten an impression that it can be done, hopefully, in another week. I am not putting pressure on them to give me something less than useful to meet the time requirement. But I think that both that time requirement by the end of next week, and that a reasonably detailed and meaningful analysis can be done.

Q Okay.

It is correct to say, however, that that analysis of all these alternatives has not yet been made, completed?

A Completed, no, sir.

Q So it is also fair to state that you don't know what the answers are going to be?

A To the analysis?

Q Yes.

A To all the analysis, that is correct?

Q Therefore, you cannot state right now that all

reasonable alternatives will not be foreclosed by continued constructions, is that correct?

A I don't think that is correct.

Q All right.

Let me ask you this question:

If your analysis determined that the Dow proposal was the most reasonable, I want you to take that as an assumption, okay?

Do you know what I mean by the Dow proposal?

A The \$300 million some odd capital cost estimate?

Q For coal.

A For coal, yes.

Q Let's assume that that will turn out to be the most reasonable alternative under an objective review.

Okay?

A All right, I will take that assumption.

Q Do you believe then, that under the National Environmental Policy Act as you understand it, it makes sense to move forward with construction of the Midland Nuclear Power Plant and spend perhaps another \$100 million?

I want you to take my assumption as given.

A Okay.

Given that the alternative to Midland Nuclear Plant production of steam, that it would be more cost effective for Dow to generate their own steam, would I say -- would I

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recommend continuing the project?

Q Right now until we get that study and do that analysis, et cetera, bases consistent with the importance of the fact.

A That is sort of a two-edged sword.

I don't think you can recommend cancelling an entire -- or suspending an entire project based on one input.

Okay?

Let me say what I am saying.

If you are talking about the total balance of the need for the facility, all right. your assumption is that you would have to -- as I understand it, you would have to couple that segment of the estimate being the Dow production of steam and electricity for their own purposes of being the most cost effective, plus another unit somewhere to generate roughly 1300 megawatts of electricity.

Q If you believe they need it, sure. I will put that in my assumption.

A And those two combined, being more cost effective than a Midland plant.

And I wouldn't say that, based on what I know now.

Q But I didn't ask you to give me your conclusion now, before the analysis, because you have already told me that you don't know what that analysis is going to show

because the work hasn't been done, or do you want to retract

mm11 from what you told me earlier?

A I would be getting out of my field of expertise to make, I think, a conclusion you are asking for, or the statement that there is enough data now to reach the conclusion.

Q Okay.

Now let me ask the question again, assuming one of the alternatives, any one of them that you are going to analyze other than the plant as proposed, will turn out to be overall more cost effective and more environmentally sound.

Okay?

Would you agree with me that it does not make sense to move forward with the plant as designed right now?

A Any one of the alternatives proposed?

Q Any one of the ones that you now say you are going to review because of this new information in the cross-examination that you just learned. I just want to know of any one of those.

You obviously know what they are, because you have got them in your head and you are reviewing it, you have got people working on it, so any one of those as an alternative to the Midland Nuclear plant as presently designed.

If we assume that any one of those alternatives is more cost effective and environmentally sound than the Midland Nuclear power project, if we can assume that is what is going to happen in the analysis, would you agree with me

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that it makes sense to suspend construction until we make and can examine -- well, no, would you agree with me that we should suspend construction on the assumption that we are going to find an alternative which is more cost effective, and environmentally sound?

A I think before I answer that you would have to tell me what are all the considerations other than the one you mentioned that are to be considered for suspension.

Is that to be the only one?

Q Yes.

A Because I wouldn't want to make a conclusion that yes, we suspend based on that, and there are other factors to be considered in suspension.

Q I just asked the question positive two assumptions.

Number one, that we are going to find that one of the other alternatives is more cost effective and is more environmentally sound.

Given those two assumptions, and everything else is equal to both projects, okay, would you agree with me that given the truth of those assumptions we stop construction of the Midland facility right now?

A I think if you can show today --

Q I have asked you to assume it is true, Mr. Echols, that one of the alternatives that you are analysing --

A I am going over your assumption in my mind orally,

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right now.

Making your assumption that one of the alternatives to the Midland project as now proposed, was more cost effective, which means that now the nuclear facility is not cost justifying, continuing from this point on.

Is that correct? Is that another way of stating it?

Q And more environmentally sound.

A And that the environmental impact associated with the alternatives are also less, okay, to a significant amount.

If things are equivalent, then there is no reason to change.

Q Oh, you don't think so. But go ahead, answer my question.

A Then I would have to say that -- and that was the only criteria for suspension, I would say that I would have to take your assumption as yes.

Q You would agree with me that we would stop construction?

A I think so.

Q You are not sure?

A Well, I am going on your assumptions, and based on your assumptions, I think so, yes.

Q Okay.

But, you have already told me that we haven't done the review to determine whether or not one of those

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alternatives you are studying now will come up to be better than the one we have got now.

A No.

I have told you that they are being done, that we should be able to make that assessment in this proceeding.

Q I am talking about right now, today, quarter of twelve.

You have told me there are no adverse environmental impacts.

You have told me that you have included within an adverse environmental impact, foreclosure of reasonable alternatives, that that is part of what you considered to be an adverse environmental impact.

And then we went through this whole line of testimony. I am now asking you on what basis do you say that we should move forward with construction right now if we don't have the information that you said if it comes out one way one opts for stopping construction.

A All right.

I think you mischaracterized one part of what you were saying there.

My testimony, when I talk about environmental impact, does not go to foreclosure of reasonable alternatives in the suspension period. Staff testimony I think as a whole goes to that. We look at all aspects.

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Q Mr. Ishols, you are project manager with a good deal of responsibility and obligation, isn't that correct?

A Yes.

Q Do you presently believe on what you now know, before these detailed studies are in, that moving forward with construction and spending another \$100 million in light of the Temple testimony and the Corroice testimony, at least, makes sense?

A Yes.

Q You do.

Do you believe that Dow and Consumers Power Company will, within the next six months, begin to sue each other?

MR. TOURTELLOTTIE: I object to that question.

That is not relevant, and this witness is not competent to answer it.

CHAIRMAN COUFAL: Yes, I think it is calling for a conclusion.

MR. CHERRY: Just a moment, now.

I want to know what specifically he believes --

CHAIRMAN COUFAL: If you want to ask him what he considered -- if he considered that --

BY MR. CHERRY:

Q Did you consider that -- that's a better question. Did you consider in your determination that we ought to move forward, on the basis of everything we have heard, the

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possibility that Dow and Consumers Power Company may sue each other?

Did you consider that?

MR. RENFROW: I object to that question as beyond the scope of this proceeding, Mr. Chairman.

CHAIRMAN COUFAL: Overruled.

THE WITNESS: Let me answer it this way:

I have taken into account everything that has gone on as best as I can, including the disagreements between Dow and Consumers. All right. And based upon that, I don't think that there are any alternatives that are being foreclosed at this time.

BY MR. CHERRY:

Q Have you finished?

A I think so.

Q Have you specifically considered in your conclusion, the possibility that within the next six months Dow and Consumers will sue each other, yes or no?

MR. RENFROW: Same objection.

CHAIRMAN COUFAL: Overruled.

THE WITNESS: I think so.

BY MR. CHERRY:

Q You are not sure?

A Yes.

Q You have?

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A Yes.

Q Now, do you believe that -- did you take it into your consideration as to what the impact on this project would be if Dow and Consumers sued each other in the next six months? Or, one sued one, et cetera? If a lawsuit ensued between the parties?

Have you considered what impact would occur in this project?

MR. TOURTELLOTTE: Mr. Chairman, I object.

I don't really see that there can be an environmental impact upon the plant by reason of the lawsuit. I don't see that that question is relevant and I object on that basis.

MR. CHERRY: Well, there is a pretty narrow viewpoint of what the environment means, by Mr. Tourtellotte's objection.

CHAIRMAN COUFAL: Well, you are assuming -- I guess the question assumes, Mr. Cherry, that the lawsuit will terminate the Dow-Consumers relationship, is that it?

MR. CHERRY: I am asking him if he has considered what impact it might have.

That is what I want to know.

CHAIRMAN COUFAL: All right, you may answer that question.

MR. RENFROW: Mr. Chairman, before he answers that, I do have an objection, if that is the way it is stated.

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My objection is based upon the grounds that he is now asking Mr. Echols to project out and make some assumption as to the Dow-Consumers' relationship.

I make this objection based upon the grounds that we have stated in our brief about this Board's ability to make some kind of predictive finding for out in the future as to this particular relationship. Therefore, I think it is beyond the scope of these proceedings.

I will not repeat, pursuant to your instructions, the argument that was in that brief. I believe he is now beyond the bounds of the scope of the proceedings, and the objection should be sustained.

CHAIRMAN COUFAL: Your objection is overruled.

I don't remember, Mr. Renfrow, that I ever instructed you not to make objections, if that is what you are saying.

MR. RENFROW: No.

I believe, Mr. Chairman, that we had an agreement that what I had covered in objection in that brief, we would merely refer to that brief.

If you had any questions about it, you would ask me, and that would save us time.

CHAIRMAN COUFAL: Okay. Fine.

BY MR. CHERRY:

Q Mr. Echols, answer the question.

The question is -- do you understand the question?

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A Did I consider the possibility of a lawsuit between the two people?

Q You already told me that, you said you did.

I want to know if you considered the impact upon this project, if any, that such a lawsuit would have.

A Yes.

Q What impact did you consider that such a lawsuit would have on this project?

A All right, let me back off and try to give you some of my thought processes when I looked at that.

Is that acceptable to you?

Q I don't know.

What I want to know is --

A I am trying to give you the most complete answer I can.

Q What specific impact on this Midland Nuclear Power Project did you consider would ensue from a lawsuit between Dow and Consumers Power that you did not regard apparently as sufficient to change the Regulatory Staff's position?

A All right, there are more than one.

Q Sure.

A That's why I wanted to give you my thought processes.

And I feel totally out of my sphere of expertise to try to judge results of lawsuits. All I can do is say if one occurs and if a certain result happens, how that might impact

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my project.

All right. And, if a lawsuit occurred, there could be no impact at all if everything stayed the same after the lawsuit. I mean, there is a lot of things that can happen in a lawsuit; they can say that the contract stays the same and all the parties have the same obligations and you take the steam as originally contracted.

If Dow sued Consumers and there were no longer any responsibilities on the part of Dow with respect to the contract, they still have a need for steam and electricity and they still may very well want to reach an agreement with Consumers.

That is one alternative.

Another is, they may not want anything to do with Consumers at all.

If that ever happened, okay -- if that event ever happened, then the Staff would have to reexamine the application in light of that event and determine its next move, which could be many things; revise their application for a single-purpose plant, find some other use for that steam, modify the design. There could be a lot of things that could happen at that point.

Q You don't want the answer to that question now, though, before you continue construction during suspension?

You don't think it is sufficiently relevant to

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to want to probe into that and get an answer?

A I probed into it. I said there are several things that could happen, one of which could affect the project.

If it affects the project, I will look at it.

Q But what I want to know, is the Regulatory Staff making any independent determination as to who is right in the dispute in order to determine whether or not the alternatives that you suggested could have impact on the project would really occur?

A You want me to assess the contract between the parties and determine who is right?

I have no such capability.

Q I don't know what anybody else on the Regulatory Staff has any, but presumably your lawyers is a good place to start.

Have you asked your lawyers for an opinion on that dispute?

MR. BENTON: I am going to object to that question, Mr. Chairman.

My position on the Regulatory Staff and this Board in determining the validity of the contract, which is the question asked, has again been argued before this Board, the case law, the Supreme Court has ruled on this, the Municipal Court of Appeals of the District of Columbia has ruled on it, without stating all that argument, I am going to object to that

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question as inquiring to the validity of that contract.

CHAIRMAN COUFAL: We agree with you, Mr. Renfrow, that this Board is not going to be the judge of what that contract does. That is between Dow and Consumers.

The question is here -- I overrule your objection.

MR. TOURTELLOTTIE: I would like to state my objection.

The question is, has he had any conversations with his attorneys on this subject matter, and if he has had any conversation with his attorneys, they are privileged and he is not entitled to know what those are.

MR. CHERRY: That is not the question.

CHAIRMAN COUFAL: Well, I think I know what you are getting at, Mr. Cherry.

Maybe you can state the question --

MR. CHERRY: Yes.

I said, have you tried to determine within the Regulatory Staff who is correct in this dispute in order to have some reasonable basis upon which to make a judgment about what will happen.

MR. TOURTELLOTTIE: I object to the form of the question.

The question assumes, the second part of the question assumes that there has to be something -- that the first part of the question has to be met in order for it to

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be reasonable action on the part of the staff.

And I think that the question, although the general thrust may be in the right direction, that to ask this witness whether something is being done so that something reasonable will result, is an improper question.

MR. CHERRY: That's gibberish.

All I have asked him is, in the context of his review over something he considered in this process, is he making an effort to find out whether that particular event that he says could impact the project, will occur.

MR. RENFROW: Mr. Chairman, I am going to object to that.

MR. CHERRY: You have already been overruled.

MR. RENFROW: If it is stated that the Board has no jurisdiction over it, then certainly Staff doesn't have any jurisdiction over that particular question.

CHAIRMAN COUFAL: Mr. Renfrow, as I understand what counsel is trying to get at is, has the Staff made a judgment regarding environmental impact of whatever is going to happen, as to what certain things are going to occur.

MR. TOURTELLOTE: I don't have any problem with that particular problem. It is just that that question was stated in such a way, it was stated approximately, "Have you considered the effects of the breach so that a reasonable conclusion can be reached."

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Now whether it is a reasonable conclusion or not, I think that is improper.

CHAIRMAN COUFAL: Mr. Cherry has restated the question. Can you restate it again so we can get the witness back to it.

MR. CHERRY: Since you have overruled the objection to the question I did state, I will have it read back.

CHAIRMAN COUFAL: All right.

(Whereupon, the reporter read from the record as requested.)

BY MR. CHERRY:

Q The answer, Mr. Echols?

A I can answer that, I think.

Yes, we have looked at what might be the result, but we have not gotten into judging who is right and who is wrong.

We have tried to see what would be the results on the project if the parties split apart or --

Q My question is, not have you determined what the impact might be if they split apart.

My question was, are you doing any review to determine the validity of the dispute, to determine whether or not the critical event will occur, i.e., the splitting apart.

Are you looking at the relative rights and obligations of the parties in the dispute to determine whether or not the

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split will occur.

MR. RENFROW: I am going to object to that question again, Mr. Chairman.

I guess I am going to have to put an objection to his asking the witness whether he has determined the rights of the parties to this dispute.

CHAIRMAN COUFAL: That's right, that is what he is asking.

MR. RENFROW: And I am objecting to that, because based on the case law, Staff has no right, no obligation, no requirement to make that type of decision.

CHAIRMAN COUFAL: If that is the case, then I suspect he will answer.

Overruled.

MR. CHERRY: Overruled.

BY MR. CHEBRY:

Q Mr. Nichols?

A You're asking have I looked at the rights and obligations of the parties?

Q No. Has the Regulatory Staff looked at it, to the best of your judgment?

A In a sense I can answer the question.

We have tried to look into the contract to determine such things as how much steam is going to a party, how much electricity, what kind of price agreements, what items are being negotiated now.

It is my feeling that in the normal course of business people will amend items as they go along to seek whatever benefit they can, such as the price they're going to pay for an item, what date they might get it and so on.

When the day comes that it is determined that there is no need for the Midland steam from Dow, either from walking away from the contract or whatever, then the Staff will look at it at that point to determine what should be done with the license.

As of today, with all of these negotiations going back and forth to seek a better position for whatever reason, the Staff believes, in my opinion, that there is a need for steam and electricity by Dow by 1984, December 1984, that Consumers Power intends to supply the steam and electricity

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by 1982, and there is no conflict in those two statements that would say that we can't assume it is reasonable that the project is a viable one as it stands today.

Q Do you feel that you've looked into all of the things necessary to, in your judgment, have the plant on line by 1984 in determining the foreclosure of alternatives over the next nine months?

MR. SOUTHWELL: I'm going to object to this question.

CHAIRMAN COUFAL: Just a minute. I lost the question. Could you read it back?

MR. CHERRY: Let us withdraw the question and ask it this way.

BY MR. CHERRY:

Q Have you considered in connection with the judgment you just gave us the fact that Consumers might not have the money to build it and at some point between now and, say, the next year Dow will make the judgment, "I can no longer rely on that; I'm going to build my own plant." Have you considered that?

A A financial assessment has been made by the Staff.

Q Have you asked Consumers Power Company where they're going to get the money in light of Exhibit 29, the statement by the president of Dow U.S.A. that he has serious reservations about their financial problems, et cetera? Have

you looked at that question at all, Mr. Echols?

MR. FOURMELLOTTE: Objection, Mr. Chairman.

This, it seems to me, has gone about as far as it should. As a matter of fact, I believe it's gone much farther than it should.

The questions that are being asked here by Mr. Cherry are asked of Mr. Echols, who is presented here as a witness for the environmental impacts of a purported suspension period, and repeatedly Mr. Cherry is asking this witness to testify on behalf of the entire Regulatory Staff about matters which are in no way related to his particular testimony.

Now, I understand that I made objections before and the Chair has overruled me; but maybe what I want is a definitive statement from the Chair if indeed you're going to continue to look to Mr. Echols to be able to testify about every facet of the HRC Staff's analysis in this case or is he only to be testifying and be cross-examined on the testimony that's offered here today?

If you're going to rule that he can testify about the whole thing, then according to our rules I have an on-going exception and that sort of thing will be taken. I won't take up your time with any more exceptions. But I think I need a clear understanding of exactly where it is we're going.

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DR. LEEDS: Let me ask a clarifying question for my own purpose here before there's any ruling on that.

Dr. Echols, is the Draft Environmental Statement and the PES Statement being considered by the Staff in this proceeding under your direction?

THE WITNESS: Yes, sir.

DR. LEEDS: Do they contain sections on financial qualifications or financial abilities of the Applicant -- I'm sorry, Licensee. Let me correct it.

THE WITNESS: I don't think there's a section on financial responsibility in the Draft Statement, although we have an expert who's going to be testifying today to that subject in this proceeding.

DR. LEEDS: Is he working for you?

THE WITNESS: He works for the Staff. I'm utilizing him for this area.

DR. LEEDS: Are you managing his input to this hearing?

THE WITNESS: Yes.

CHAIRMAN COOPER: The problem comes about by reason of the fact that Mr. Echols testified that he's an environmental project manager, so perhaps we've let him wander beyond his testimony.

Do you have witnesses coming on financial, on other aspects?

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MR. TOURTELLOTTE: Yes.

CHAIRMAN COUFAL: All right. Sustained.

MR. KOEFLING: Mr. Chairman, that's not correct. We have a witness coming to speak to the effects of delay. We have no witness coming to address the financial qualifications of Consumers Power Company.

MR. TOURTELLOTTE: There is a distinction here between, I suppose, financial qualifications and the effects of delay, although, in light of the way the cross-examination of this witness goes, it's hard to see how anyone who's presented to discuss the delay costs is going to be able to avoid financial qualifications. That certainly is far closer than this is.

CHAIRMAN COUFAL: I think your objection to that question with regard to this witness is well taken, Mr. Tourtelotte. It does go far beyond the scope of direct.

BY MR. CHERRY:

Q Mr. Echols, do you consider as part of an environmental review, or any kind of review under your jurisdiction, to determine whether or not over the next several months, and indeed under the 1981-82 schedule, that Consumers Power Company has sufficient capital and access to it to be able to build the plant? Do you consider that a relative inquiry in this proceeding as you see the environmental issue?

MR. RENFROW: I'm going to state my continuing

objection to that as to finances, Mr. Chairman.

THE WITNESS: Normally on a review the financial responsibility of the applicant falls under the safety side and not under the environmental side.

I am overseeing that review as it applies to this case, and we have an expert to testify to that subject in certain aspects in this proceeding because we feel it's important.

BY MR. CHERRY:

Q Your counsel has just said that he's going to have a financial man testify as to delay cost, not as to the financial ability to pay for the plant.

My question was not who you're going to have -- I'll wait to see who comes. I want to know whether you consider it relevant based on what you've heard in this proceeding to assess whether Consumers Power Company has the ability and will be able to raise the money to finish the Midland project under the schedule either proposed during the suspension proceeding or through 1981-82. Do you think that is an important thing for you to do?

A I think that's two questions. You said for the suspension proceeding and for the total project.

Q Yes.

A For the suspension proceeding, we're doing exactly that.

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Q So you think it's important to know whether Consumers Power Company has the money, where they're getting it, how much it is, et cetera? You're doing that kind of inquiry?

A I cannot speak to the details of the analysis. I'm sorry.

Q But you think that inquiry must be made?

A I can't speak to what must be made in that area to be sufficient.

Q So you cannot answer whether you agree with me that we have to find out whether Consumers has the money or will be able to get it to complete the schedule if we don't suspend? You don't agree with me that that's important to do?

A I think what you asked earlier was several sub-categories of that, I think; but it is certainly relevant for the suspension proceedings to know whether they can fund the items that they're talking about for the suspension proceeding.

The person that's going to talk to that subject would be more able to answer your questions as to what is relevant or what is not relevant under that subject.

Q But you agree that at a minimum it's important to know whether they can fund what they want to do during the period between now and the end of the year, for example?

2. I certainly think that's relevant, yes.

Q. Okay.

Do you also think it's relevant to determine whether or not Consumers Power Company -- and I mean relevant to this proceeding -- to determine whether or not Consumers Power Company would be able to raise the capital and build the plant on this schedule, 1981-82? Do you think we should know that now, too?

A. You say impact on schedule, whether their financial status would affect the schedule. And that would go to -- what? The ultimate success of the project?

I'm sorry.

Q. All I want to know is whether or not you think we ought to know in this proceeding whether or not Consumers Power Company will have all the money it needs to build the Midland nuclear power project and have it commercially operable by the 1981-82 schedule. Do you think we should know that?

MR. FOURTELLOTTI: I'm going to object to that question. Again, it seems to me it goes far beyond the scope of this witness' testimony.

MR. CHERBY: Mr. Chairman, it goes to the question of foreclosing alternatives in the next nine months.

He has testified there are no environmental impacts over the next nine months. If they're not going to

have the money to finish in 1981-82, then it doesn't make any sense to move forward now.

He has also testified that if one of the assumptions on this other alternative review, if we assume that one of those would be more cost-effective and more environmentally sound he'd stop construction. He said that.

Well, I would assume that the logic of that applies, that if they can't finish it on schedule -- and they may not get it done until, say, 1990, when Dow has testified they're going to walk away -- then maybe we ought to do it now. It goes to a whole lot of things.

I don't think we should permit the Regulatory Staff's project manager in charge of the environmental impact statement to shirk from honestly dealing with the issues in the cross-examination that's preceded.

MR. TOWNSEND: May I speak to that, Mr. Chairman?

CHAIRMAN COOPER: Yes.

MR. TOWNSEND: This witness is testifying solely to the fact, as Mr. Cherry indicated, that there are going to be no additional adverse impacts over the next nine months.

Now, what earthly difference could it make whether Dow sues Consumers, whether there is a continuing contract, or what happens in 1986 or 1990 as to whether there are or

20 there are not additional environmental impacts over the next nine months?

There simply isn't any relationship between those two questions.

What Mr. Cherry is seeking to do is to go far beyond this nine months and elicit from this witness, who may not even be qualified to testify on this subject matter, what he thinks about what may happen in five or ten years, whether the company should be required five or ten years from now to have certain financial qualifications.

This witness has already testified he can't talk about financial qualifications, and all he is really doing for the record is giving his opinion, for which there is no expert basis.

CHAIRMAN COURER: I sustain your objection. I think we are getting way beyond.

BY MR. CHERRY:

Q Mr. Echols, if the remedial hearing took until the end of 1973, would you agree that whatever the Applicant proposes through 1973 would not have any environmental impact, adverse?

A I think now we have it to September '77, and you're saying to December '78, to the end of the year 1978?

Yes, I think that's correct.

Q I take it it's your position, just as Mr. Wells,

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what the hole is already dug and the major work is done so that in your judgment there would be no any adverse environmental impact if the remainder starting with the hole until the total plant was completed?

A No.

Q At what point would you say there would be the beginning of adverse environmental impacts if we weren't through with the remainder hearing?

A All right.

In reviewing the old EIS, the March '72 EIS, and trying to look at changed circumstances since then, there are items that may or may not impact the total project as far as environmental cost-benefits are concerned.

It's my opinion that the ultimate conclusion will most likely not change, but to give you an example of the impact that would be felt, now by '76 but maybe by '78, that is the workforce is going to peak probably in '78 at about 2,600 people. Earlier we looked at around 700 people as a peak and, of course, at a much earlier date.

For my own peace of mind in this project, I want to know what the impact is on the local community of 2,600 workers -- whether they're all from the general area, whether they're coming in and bringing families with them. There's a whole myriad of socioeconomic impacts that could be associated with that.

13 Q Anything else?

A There are costs and benefits to each one of those.

Q Anything else?

A No, I don't think so, not that would affect this.

Q So it is your testimony that, aside from what you've just related, Consumers Power Company could build the entire plant up to the point of operation and would not have in your judgment any adverse environmental impacts while the remedial hearing was taking place?

A I'm trying to think if there are any other items that come to mind.

Q Sure.

A There are other items that come to mind, but not directly related to construction, I don't think.

I think it's true that most of the significant impacts for construction have occurred, specifically the site related. All the ground has been moved that's going to be moved. They're going to rearrange it, but essentially that impact has occurred.

The workforce is something that I still have a question about in my own mind, how that might affect the community. Once you get to operation, that's a whole other thing, and I want to look at changed circumstances.

I don't think continuing between now and, say, '79, when that workforce --

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Q No, I mean all the way to the end, excluding the workforce problem. That was my question, Mr. Echols.

A I'm sorry.

I think that's a valid statement.

Q There would be no adverse environmental impacts. Okay, would you also agree with me that no reasonable alternative will be foreclosed if the remanded hearing and the end of construction were completed on the same day? In other words, we could go through the entirety of the remanded hearing and continue construction because no reasonable items were foreclosed, because you could always tell them to tear the structure down.

Would you agree with that?

A I don't think I can, no.

Q At what point would construction foreclose reasonable alternatives, in your judgment?

A I can't say how that would go, the reason being there's dollars being spent every day this is going on. There is either an advantage or disadvantage of an alternative to nuclear with a certain dollar amount associated with it.

There may come some point where so many dollars were spent in the period to the end that an alternative might be foreclosed.

Q You don't know what that point is?

A I think -- I am not a cost-benefit man, okay, so I'm trying to go back into some of the items that I've looked at to give you an opinion with all the qualifiers I can possibly put on it.

But to try to answer your statement as honestly and completely as I can, the advantages that we're seeing of a nuclear project over alternatives for the life of the projects, any alternative for the life of the nuclear project, I think -- and let me state that when that expert comes on he can correct my testimony, because, again, I'm not in my field -- I think it's on the order of a billion dollars.

I don't think -- I think the amount to be spent on the project from this point on is like a billion three hundred million, so the break-even point would be the point where they have \$300 million to spend on the project.

That's a very simplistic way to answer, and I apologize; but that's the best I can do.

Q Do you mean to say that in your judgment the mere spending of \$800 million, or \$700 million, would not have any tendency as a practical matter to foreclose alternatives?

A If you're looking at strictly a balance sheet and you say, "Which is the most economically feasible way to go," you'd have to overcome the advantage that's with the

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nuclear project.

Q Spend the money, or evaluate that advantage in an analysis before you spend the money?

A At any time.

Q Have you looked at whether or not Consumers Power Company is able to implement an advantage and take a \$700 million loss -- implement an alternative and take a \$700 million loss? Have you looked at that question?

A Have I personally?

Q I withdraw it.

Do you think that's a reasonable inquiry to make?

A I think the reasonable inquiry to make --

Q No, no. Do you think what I asked you is a reasonable inquiry?

A To see whether they can absorb--

Q How much money they're going to spend until the time we finish this remedied hearing.

A I don't think that's -- well, I think --

Q Do you think that is a reasonable inquiry, Mr. Echols?

A No, and for this reason.

At whatever point a decision has to be made whether to go on or whether to drop the project, you are faced with those losses or with those benefits at that time.

If today Consumers decided, "I don't want to build

that project," they would have a \$400 million investment that they had sunk into that project that they can't use. Whether or not they can do anything about it, that really doesn't have anything to do with it. That's the fact: they have it; they have a \$400 million loss.

If they push on and down the road they spend another \$100- or \$200 million, okay, they still have to make a decision on what's economically most sound for them.

If at that time it was determined that another alternative in the long run, at the end of whatever alternative they were talking about, saved them money, you're looking at saving money, not losing money. Either way you're going to have a cost, all right?

In other words, you look at the costs that are ahead of you. If you say to yourself, "I'm going to go ahead with this project, even though it's going to cost me three times as much as an alternative, because I've already got \$400 million in it," that doesn't make sense. That's not what you look at.

You look at it; you say, "I'm going to go ahead with this project because it's much cheaper than any alternative at this point."

Now, at that point in time you're still asked to make the same inquiry: Is there any alternative that would be cheaper for my company at this point in time? If

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the answer is yes, you would switch, because that loss would come into the calculation of whether or not it's cheaper to switch.

Q Have you read the opinion by the Court of Appeals in Aeschliman, which says that you cannot look at sunk costs in making the revised cost-benefit analysis?

A I didn't say that. I meant to say the "go" costs. You do not look at your loss; you look at what's the cheapest way to go from that point on.

Q But from a practical standpoint you're telling me that the amount of money that Consumers is spending really has no bearing on the overall analysis? I think that's what you told me.

A I'm saying it has a bearing if it precludes an alternative.

Q You don't think that spending \$100 million as a practical matter might foreclose reasonable implementation of an alternative?

A At this point, no, I do not.

Q You don't think Consumers Power Company is fighting for this plant very hard because it's got an investment already, and they'll fight harder because they have an increased investment? Do you think that's true?

MR. TOURNELLOTTE: I object to that question. It's not intended to elicit a meaningful answer from this

witness.

CHAIRMAN COUFAL: I think it calls for a conclusion of this witness that he can't make, so I'll sustain the objection.

BY MR. CHERRY:

Q Mr. Echols, can you tell me what conversations you've had with Staff members, identifying them, other than lawyers, about this proceeding since I began cross-examination? Tell me who you've talked with, both in Chicago and on the telephone.

I want everybody's name other than a lawyer.

A All the Staff members that I've talked to since this proceeding? That's like back in December?

Q Since I began cross-examination.

A When did you begin cross-examination?

Q In December.

A All right.

My immediate supervisor, Bill Regan.

Q Bill Regan?

A Regan.

Q Who else?

A Klaus Moore.

Q Who's he?

A His bos.

Q What is Mr. Moore's position?

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A He's the A.D.

Q What is A.D.?

A Assistant Director.

Q Who else?

A I talked to Joe Youngblood, who is the Chief of
Cost-Benefit Analysis Branch.

Q Who else?

A Sid Feld.

Q Okay.

A Arnie Melts, who is doing the financial analysis.

Q How about Edson Case?

A I have not spoken to him.

Q Have you been in a meeting where the Midland
project was discussed where Ed Case was in the meeting since
December?

A I don't think since December. Early on, I think,
yes would be the answer to that question; but I don't think
since December, no.

Q Anybody else you've talked to?

A There have been some people in Radiological
Assessments. The specific name -- I think Frank Congel.

Q Congel?

A C-o-n-g-e-l, I think is the spelling of his name.

Q Anybody else?

A I think -- I can't identify the person, but I

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think I talked to someone in the Environmental Statement Branch as well.

I just really can't recall. I could check on that for you.

Q Now, has anybody that you have talked to, other than lawyers in this proceeding, expressed doubt as to the foundational basis now of the Regulatory Staff's position in favor of continuing with construction in light of the testimony that has taken place thus far?

Has anybody at all said, "Maybe we ought not any longer support continued construction during the suspension?"

A There's a presumption in there that I think is wrong.

Q My question -- I withdraw that one, and I'll ask it again, because, Mr. Echols, you have a habit of giving me a speech, okay?

I've put up with it, because I'll stay here all week if necessary to finish you, and then that will be the last person I cross-examine. I won't put on any testimony, okay?

A All right, sir.

Q If you think that's important and fair, then you continue to do what you want.

Now, Mr. Echols, what I want to know is, anybody you have talked to other than lawyers since December of 1976

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working for the Regulatory Staff, has there been a discussion about the continued suitability of the Regulatory Staff's position in this proceeding?

Now, you can answer that question yes or no, and then I'll get into the conversations.

A. I think the answer is no.

Q. No one has raised the question with you as to whether any of the cross-examination has prompted a significant dent into the Consumers case so that the Regulatory Staff position is in doubt?

A. Let me tell you our position.

Q. I want you to answer my question first, and then you can tell me your position.

A. Same answer.

Q. Same answer.

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

THE WITNESS: I'd like to explain my answer.

MR. CHERRY: Go ahead and explain it. Do it, and then I do have one other question.

THE WITNESS: I have been told time and time again by everyone I talked to, by the people that I've named there; Mr. Case -- his word has been relayed to me by those people. I haven't been a party to those conversations. But the policy of the NRC Staff as explained to me by everyone, and I thoroughly agree with it, is that we are not

getting ourselves in the position of being an advocate for anything, that the last thing we want to do is to be coming down on one side or the other.

We are the regulatory agency, and we're supposed to at least try to maintain a dispassionate position and give our best analysis to the situation and reach a reasonable judgment.

I've been told by every supervisor I have, and their supervisors, that we do not want to get ourselves in the position where we're taking up the cause of Consumers Power.

BY MR. CHERRY:

Q Have you finished your answer?

A There is -- it's almost a quote, I think, that "Let the chips fall where they may." If the result is adverse to Consumers Power, so be it.

Q How many meetings have the Regulatory Staff and Consumers Power had just before the hearing in order to find out what the testimony was?

A Pardon me?

Q How many conversations have the Regulatory Staff and Consumers Power Company had in order to jointly prepare for this proceeding?

A There was another assumption in there.

Q Are you telling me none were ever had in order to

jointly prepare?

MR. HOURSLOTTE: I object to the characterization. I think there is an assumption in the question, and I think the witness is entitled to object if there is an assumption that he can't abide.

MR. CHERRY: And then I then followed up. Maybe you didn't hear it, Mr. Hourslotte.

BY MR. CHERRY:

Q Can you tell me now that there were no meetings between representatives of Consumers and the Regulatory Staff jointly to prepare for this proceeding.

A As you state the question, the answer is that there have been no such meetings.

Q To arrive at a joint position?

A That's correct.

Q If I showed you documentary evidence to the contrary, you would tell me you didn't know anything about it or presently you don't know of any documentary evidence to the contrary?

A I may not understand what you mean by "jointly."

Q To arrive at a parallel conclusion or position in this proceeding.

A Well, we may reach parallel conclusions without --

Q I said a meeting in order to arrive at a joint parallel position.

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A I know of no such meeting.

Q Okay.

Now, what information that you believe you learned or the Staff learned, during the cross-examination in this proceeding which has led you to look at other alternatives -- if you remember our earlier reference --

A Yes, sir.

Q -- couldn't you have determined prior to these proceedings if you made inquiry of Dow Chemical or Consumers or anybody else?

A I don't think -- well, let me start again.

Some of the information that we derived was duplicative -- in other words, we were getting information from our interrogatories, from testimony being filed by all parties that raised questions, examination and cross-examination by yourself; and all of those prompted questions by the Staff to get further information.

I don't know of anything, to answer your question specifically, that you did that the Staff could not do.

Q That the Staff could not do?

A Yes, sir.

Q And you agree that the cross-examination by me revealed information which the Staff could have gotten before the hearing began, which information is now prompting the Staff to look at alternatives that they had not looked at before? Do you agree to that?

1 A No. For this reason -- well, it could have, but
2 it is difficult. --

3 Q Well, I will change it:

4 Should have. How's that? That will put it right
5 there. Do you think --

6 A Under the circumstances, I think that we got all
7 the information that we could have, or should have under
8 the methodologies we were proceeding on. I want to state
9 that any time we get information what what ever source, we
10 are grateful. Okay?

11 And I think that the fact that we have inter-
12 veners in a proceeding that can ferret out information, it is
13 a positive force in helping us in our job. And it has al-
14 ways been my feeling that one of the best things about the
15 proceedings is having intervention. It has helped --

16 Q You did it again, Mr. Echols; you are giving me
17 a speech. My question was simply this:

18 What information that was brought out during the
19 cross-examination that has now led you to look at alterna-
20 tives you weren't looking at before could not have been gained
21 by the Regulatory Staff prior to the proceeding, if they
22 want after that information?

23 MR. FOURBELLOW: I object. It calls for a
24 conclusion of this witness. It is subject matter that may
25 or may not be in --

1 CHAIRMAN CONYAL: I think that is overruled.

2 THE WITNESS: I am unaware of any.

3 BY MR. CHERRY:

4 Q So that you could have analyzed the alterna-
5 tives, you are currently analyzing, some time prior to the
6 hearing, if you had gone and sought the information? Correct?

7 MR. SCURMELLETT: I object to that question.

8 The previous answer of the witness would disagree with the
9 assumption in the question.

10 MR. CHERRY: He told me there was no information
11 that came out of cross-examination which now has prompted a
12 look at other alternatives, that the Staff could not have
13 gotten it if they wanted, before the hearing; isn't that cor-
14 rect?

15 BY MR. CHERRY:

16 Q Isn't that right?

17 A No. Let me explain.

18 Q Just a minute now. Just a moment, Mr. Echols.

19 MR. CHERRY: I want the previous question and
20 answer.

21 (Whereupon, the reporter read the prior question
22 and answer as requested.)

23 BY MR. CHERRY:

24 Q Mr. Echols, do you want to change the answer to
25 the question that has just been read to you; i.e., the one

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you said that there is no information which I brought out in cross-examination, which has prompted you to look at alternatives that you could not; that is, the Regulatory Staff, have gotten yourself if you went after it? You said there is no information you could have gotten, if you had gone after it. Do you want to change that answer?

MR. TOURTELLOTTI: I object to that characterization, because I believe what was read there is, "I know of none," or, "I don't know of any." That is closer than the way it was characterized by Mr. Cherry.

CHAIRMAN COUFAL: Is that the way you recall the answer, Mr. Echols?

THE WITNESS: Yes, and I think I can explain. There was a difference between the first time you stated the question and the second time you stated the question, because you stated it differently the second time in my mind.

The first time you said; "Prior," -- or at least one time you said: Prior to your cross-examination was there any time --

BY MR. CHERRY:

Q I am not giving testimony.

A The first time you said prior to the hearing, was there any time and the other time you said it was prior to your cross-examination and I gave a different answer.

The reason is that during the hearing information

1 was elicited other than from your cross-examination, and
2 that is from the direct testimony that we analysed on cross-
3 examination from our own attorneys.

4 Q The information that I brought out in cross-ex-
5 amination from Temple, Orrefice and Heins and what ever else
6 has been brought up; has any of that information led you to
7 look at another alternative?

8 A No.

9 Q None of it.

10 Goodbye, Mr. Echols.

11 A May I explain that?

12 Q You can if you want; I don't care to hear it.

13 A We were examining the alternatives I mentioned
14 already which were the alternatives to the steam and elec-
15 tricity, other fossil units, before the testimony by
16 Mr. Orrefice and Mr. Temple at this proceeding. We have
17 been doing it based also on their written testimony -- on
18 the written testimony of Mr. Temple and also from just, I
19 guess, general perceptions about the degree of the contract --
20 I am getting a little off there, but the point is that
21 didn't change anything when Temple and Orrefice made their
22 statements even stronger in this hearing.

23 We had already begun our analysis of alternatives.
24 Much of what I got from Mr. Orrefice and Mr. Temple and as
25 well, from the Consumers' people, is that there is a lot of

1 jockeying for positions on improving their status in the
2 contracts; prices, terms of delivery. There is a lot of
3 things that these two corporations are seeking to -- advan-
4 tages they are both seeking to see.

5 CHAIRMAN COUFAL: Okay.

6 THE WITNESS: That has nothing to do with the
7 alternatives we were assessing.

8 CHAIRMAN COUFAL: Does Dow have any cross?

9 MR. PRIBILA: We have no cross.

10 CHAIRMAN COUFAL: Do you have any redirect, Mr.
11 Tourtelotte?

12 MR. TOURELLOTTE: Could I have a couple of min-
13 utes?

14 (Pause.)

15 CHAIRMAN COUFAL: Go ahead, Mr. Tourtelotte.

16 REDIRECT EXAMINATION

17 BY MR. TOURELLOTTE:

18 Q In cross-examination, Mr. Cherry asked you several
19 questions. One of the questions was with reference to
20 these investigations that are made into viable alternatives.
21 The question was to the affect; whether you knew specifically
22 what that analysis would show. And I believe you answered
23 that you did not know specifically what that analysis would
24 show.

25 I ask you the question: Do you have a reasonable

1 understanding or believe that you have a reasonable knowledge
2 of what that investigation will show?

3 MR. CHERRY: Objection. The witness testified
4 and Mr. Tourtellotte has made an objection on direct that that
5 is beyond the scope of this witness' testimony, that the
6 alternative analysis is being covered by another witness and
7 that they were being done by other people and he didn't have
8 any details on it and there is no foundation for that ques-
9 tion. It is barred by the objections of his own counsel.

10 MR. TOURTELLOTTE: Mr. Chairman --

11 CHAIRMAN COUFAL: You don't have to speak, Mr.
12 Tourtellotte. I have overruled the objection.

13 THE WITNESS: Do I have a feel for the outcome
14 of those analyses?

15 BY MR. TOURTELLOTTE:

16 Q Yes.

17 MR. CHERRY: No; the question is: Do you know, not:
18 Do you have a feel? I would object to that answer in light
19 of that question as nonresponsive.

20 BY MR. TOURTELLOTTE:

21 Q The question was, if I may state it again; do
22 you have a reasonable understanding of what these investiga-
23 tions will show?

24 A Yes, I do.

25 Q And would you state for the record what your

267 1 understanding is?

2 MR. CHERRY: Objection; the same grounds.

3 CHAIRMAN COOPER: Overruled.

4 THE WITNESS: That on a cost-benefit standpoint,
5 none of the alternatives are cost-beneficial to the proposed
6 project.

7 BY MR. FOURSELOTT:

8 Q Also in cross-examination, Mr. Cherry gave you a
9 hypothetical where he asked if there were a continuation of
10 the suspension hearing through 1978, would you think this
11 might affect your testimony here today.

12 I have a question: If there were a continuation
13 of the suspension hearing through December 1978, would you
14 continue your environmental review through that time?

15 A Surely.

16 Q And in that circumstance, might you make another
17 report or maybe several reports, if significant change were
18 to occur?

19 A Yes.

20 Q And in fact, in principle, the NRC continually re-
21 views the environmental status and significant changes and
22 issues amendments to, say, Final Environmental Statements,
23 if required; do they not?

24 A That's correct. We are in the midst of a contin-
25 uing review right now.

1 Q Another series of questions Mr. Cherry was in-
2 quiring into; the effect of expenditure of funds on the over-
3 all cost-benefit balance.

4 And I would ask you the question: In the \$1.67
5 billion that we have as an expected cost for this plant
6 right now and given the sum, \$400-plus million, that have
7 been spent to date, in making out your environmental assess-
8 ment, do you give the benefit of that \$400-plus million to
9 Consumers, or is Consumers penalized with respect to evalua-
10 ting viable alternatives?

11 A There are no benefits credited to Consumers Power
12 for having spent that money. We don't look at that.

13 And as far as being penalized, we look at to go
14 costs in some aspects, but I think when we are doing the
15 alternative analysis, we look at the full costs of the
16 project, whether there is a penalty involved in that case of
17 the \$00 million. Now specifically that relates to the anal-
18 ysis would have to be addressed by the one testifying on it.

19 But no benefits are derived and penalties are
20 given. How they are given, I can't state.

21 Q One other questions, Dr. Echols.

22 Do you believe that your environmental analysis
23 here is an impartial analysis?

24 MR. CHERRY: I object to the form of the question.
25 It is also irrelevant.

1 MR. TOURTELLOTT: Mr. Chairman, it seems to me a
2 great deal of what Mr. Cherry was cross-examining Mr. Echols
3 on --

4 CHAIRMAN COUNAL: What's wrong with the form of
5 it, Mr. Cherry?

6 MR. CHERRY: Well, it is not permitted to have
7 this witness testify in a conclusion fashion as to whether
8 he thinks his testimony is impartial.

9 CHAIRMAN COUNAL: Overruled.

10 THE WITNESS: Do I think it is impartial? Yes.

11 (Pause.)

12 BY MR. TOURTELLOTT:

13 Q You also testified under cross-examination that
14 you were directed by MRC management to let the chips fall
15 where they may in this case and not take up the case of
16 Consumers Power.

17 A That's right. It wasn't that I was directed.
18 That was the statement -- the statement saying I was directed
19 might have implied that I had some other thought in mind.
20 And I complete agree with that from the beginning. It was
21 stated repeatedly that what ever happens; happens. We are
22 not going to be taking sides. If something adverse to Con-
23 sumers happens, so be it. If something beneficial happens
24 to Consumers, so be it. That is not our concern.

25 MR. TOURTELLOTT: I have no other questions.

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1 CHAIRMAN COUFAL: Mr. Cherry?

2 RECROSS-EXAMINATION

3 BY MR. CHERRY:

4 Q You said you had a reasonable understanding of the
5 analysis of alternatives that are moving forward now. Under
6 those alternatives, was the Dow proposal to build the coal
7 plant; is that correct?

8 A Yes.

9 Q Is the Staff accepting the Dow figures in connec-
10 tion with that analysis?

11 A In one respect, yes. We had heard your earlier
12 testimony on cross-examination --

13 Q My testimony?

14 A Excuse me; your cross and your statements in that
15 cross that you gave great weight to it. Dow, in their testi-
16 mony, seems to substantiate the fact that they do a careful
17 analysis and that the error of their analysis is usually
18 five percent. So for one of the analysis of that number,
19 we took their number and looked at the total plant cost based
20 on that.

21 A We are also generating our own numbers for a
22 facility that would do the same thing; produce steam and
23 electricity. So it is both; we look at their number and we
24 generate our own.

25 Q At what point above \$1.67 billion of the total cost

1 of the Midland facility would you say would impact upon the
2 reasonable alternatives that the Staff is analyzing? What
3 figure would the plant have to cost?

4 MR. RENFROW: Objection, Mr. Chairman; unless
5 it is clear that we are talking about this point in time and
6 not some other.

7 MR. CHERRY: I don't understand the objection.

8 BY MR. CHERRY:

9 Q In your analysis, have you considered as to the
10 possibility that the cost could be higher than \$1.67 billion?

11 A Yes.

12 Q How much higher than \$1.67 billion must the plant
13 cost before you will agree that some other alternative, the
14 analysis of which you have an understanding, would have a
15 better cost approach?

16 MR. RENFROW: That's my objection, Mr. Chairman.
17 If it is clear that we are talking about now -- the figure
18 may not be applicable six months from now because that is
19 analysis at this point in time -- then I have no objection
20 to that question.

21 MR. CHERRY: I still don't understand the objec-
22 tion. I am just asking him if in his analysis at what point
23 does he believe that the Midland nuclear project, if it
24 reaches that point --

25 CHAIRMAN COUFAL: In his current analysis?

1 MR. CHERRY: Sure. I don't want him to --

2 CHAIRMAN COUFAL: All right.

3 MR. CHERRY: -- tell me what it is going to do in
4 six months.

5 BY MR. CHERRY:

6 Q The one you have a reasonably understanding of
7 that you testified to Mr. Scurtellotte you didn't think it
8 would matter; what is that figure?

9 A We haven't done a break-even analysis as such.
10 What we have done is looked at the difference in hundreds of
11 millions of dollars between the proposed project and the
12 alternatives. I guess you could draw the conclusion that
13 it would have to raise that amount -- the proposed project
14 would have to raise that amount of the difference to be
15 equal to the cost of the other.

16 We have looked at the nuclear project at \$2 bil-
17 lion and at the \$1.67 billion. We have looked at some of
18 the alternatives.

19 Q Answer my questions, Mr. Echols.

20 A It is several hundred million dollars; up to
21 about \$1 billion.

22 Q So that the Midland --

23 A Depending on the alternative, it can be as low as
24 maybe \$400 million increase from, say, the \$1.7 now -- let's
25 say, if it went to \$2.1 billion -- the reason I hate to say

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1 that that would be a break-even point though is if you go
2 into the future and say it is going to come up to \$2.1 billion,
3 we would have to look at it again to see if anything else
4 has come up along with it.

5 Q Right now, as of today, if Dow went its own way
6 and if Consumers went ahead and just produced what ever you
7 believe they needed for electricity; at what cost of the
8 Midland power plant, based on your analysis, would it have
9 to get before the alternative I have just described is more
10 cost effective?

11 A This is out of my field of expertise. What I
12 stated earlier is that the nuclear project as proposed is
13 more cost-beneficial than any of the other alternatives or
14 combination of alternatives that we have seen so far.

15 You are now asking me to put a specific amount
16 to that. And the best I can give you is that it is on the
17 order of hundreds of millions of dollars.

18 Q Hundreds of millions of dollars?

19 A That's correct.

20 Q Do you realize that the cost of the Dow steam is
21 based on the total cost of the project?

22 A Yes; for the life of the project, for the Dow
23 steam project.

24 Q Do you have an opinion, or have you solicited in-
25 formation from Dow Chemical Company as to whether if the

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1 total nuclear project cost goes up hundreds of millions of
2 dollars they would still favor the project?

3 A I am not aware of any contacts from the Staff to
4 Dow on that specific question.

5 Q Do you think that is a relevant inquiry?

6 A I think it is conjecture.

7 Q Conjecture?

8 Let me ask this question: Have you looked at the
9 Bechtel Forecast 2?

10 A Is that the --

11 Q The most recent one by Bechtel?

12 A Is that the \$1.4?

13 Q \$1.67 forecast, which is now going to be increased
14 by approximately \$90 million. In other words, have you
15 looked at the information to determine whether or not in fact
16 the plant costs will go up another \$160 million

17 A I haven't looked at that proposal myself because
18 I am not qualified to look at that proposal?

19 Q Has anyone at the Staff looked at it?

20 A Yes.

21 Q Who?

22 A Sid Feld.

23 Q Has he concluded that the \$160 million won't
24 matter?

25 A Pardon me?

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1 Q Is it your understanding that Mr. Feld has con-
2 cluded that the \$160 million doesn't matter?

3 A On a cost benefit basis?

4 Q Yes.

5 A Yes.

6 Q What if the amount were \$500 million; is it your
7 understanding that on the basis of the analysis, that would
8 not matter, either?

9 A We haven't been pulling numbers out of thin air,
10 but I think to answer your question, that would be getting
11 to the point of being equivalent, I think to some of the
12 alternatives.

13 Q Have you determined whether or not in fact the
14 construction might rise as much as will reach the break-even
15 point? Have you done that analysis?

16 MR. TOURELLOTT: Objection, Mr. Chairman. I
17 think the witness has already testified that he has not ob-
18 tained any information on what the break-even point is.

19 BY MR. CHERRY:

20 Q Are you doing that analysis to determine whether
21 or not in fact, construction costs will rise to a point
22 where break-even is reached?

23 MR. TOURELLOTT: Same objection. How can he
24 answer that question if he doesn't know what the break-even
25 point is. And he has already testified he doesn't know what

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1 the break-even point is.

2 CHAIRMAN COUFAL: Well, I think there is a rele-
3 vancy here somewhere.

4 Are you making any analysis.

5 MR. RENFROW: I am going to overrule --

6 (Laughter.)

7 MR. RENFROW: I am going to object to the question
8 as it is stated, Mr. Chairman, because as it is stated, he
9 wants him, I believe, to project out into the future and it
10 is not limited to what he knows.

11 That was my objection before when you overruled
12 it. My objection is based on the fact that what his projec-
13 tion is now has got to be based upon what he knows may hap-
14 pen to the cost, not what may happen nine months, twelve
15 months in the future, because at that time, his review will
16 have to take everything else into account.

17 CHAIRMAN COUFAL: The question was: Is he making
18 an analysis, Mr. Renfrow. And that can be yes or no.

19 THE WITNESS: I think so, yes.

20 BY MR. CHERRY:

21 Q In order to project costs from today over the
22 life of the plant to determine whether or not it will reach
23 some time in the future the break-even point; you are making
24 that analysis?

25 A No.

b17 1 Q You are not?

2 A What we are doing is we are seeing how much an
3 advantage exists today, and say it is \$500 million -- I
4 don't want to in any way legitimize that number -- and today
5 make an assessment based on that difference.

6 If later on it went up and if we make an assess-
7 ment that there is a \$500 million benefit over the alterna-
8 tive and then at this point because -- and then later on
9 someone comes in and says there is a \$100 million price in-
10 crease on the nuclear project, that wouldn't affect our
11 conclusion.

12 End 6
13 fols.

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Q No, my question is, are you sitting down today and making a forecast based on some hard assumptions as to what, in fact, the plant will really cost, based upon your independent evaluation?

Are you doing that or not?

A No, we are not making projections, to my knowledge.

MR. CHERRY: I have nothing further.

CHAIRMAN COUFAL: Any further questions?

MR. TOURELLOTTE: We have no further questions.

MR. PRIBILA: No questions.

MR. RENFROW: I have no questions, Mr. Chairman.

CHAIRMAN COUFAL: All right.

(Witness excused.)

CHAIRMAN COUFAL: Well, that is timing. I said we are shooting for one o'clock. Shows you what a good Chairman can do.

I thank you gentlemen for your cooperation in permitting us to depart here at this early hour today, because it is storming and some of the counsel have told me they have had phonecalls from where they live that it is going to be difficult to get home for some of them.

We will be back here in the same room next week, 1:30 Monday afternoon.

MR. CHERRY: It is not possible to start before

1:30?

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CHAIRMAN COUFAL: Dr. Leeds' plane gets in at 10:40, that would be cutting it pretty close.

MR. CHERRY: And it is contemplated, based on what the Board knows, to conclude the suspension hearing at the conclusion of next week?

CHAIRMAN COUFAL: We will do everything we can to do that, Mr. Cherry.

MR. CHERRY: So that everybody is aware today, that that is my request and the Board has concurred in that, so that if any one of the people decides to put on a witness, we better not go through what we went through before. I mean I think lawyers should now be very careful what they propose to the Board so we don't waste any more time.

MR. BENFROW: Mr. Chairman, I don't want my silence as acquiescence. I am going to try to finish this proceeding next week. I will offer the witnesses, including taking into account this morning's ruling by the Board, in getting our case completed.

We certainly would like the proceeding over by next week and we will work as hard as we can to do that, and continue to work all weekend with the witnesses.

But I do not want to limit myself, or in any way agree that I will prejudice my client's right to put on his case in response to the questions brought up by any kind of indication. I will agree that if I don't get finished,

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I will quit Friday at 5 o'clock.

MR. CHERRY: Mr. Chairman, I just want to make it clear that while I will make every attempt to serve on everybody by 9 o'clock in the morning on Monday, Dr. Timm's testimony, if by the time the conclusion of the Staff and the Regulatory Staff, there is not sufficient time to cross-examine Dr. Timm's testimony, I will withdraw it because I believe I have sufficient records that I can stand on right now.

I just want to make it clear to everybody though, that's what I am going to do.

And if the Board has to make some priorities listening to redirect, rebuttal and all this other junk, the Board is going to have to make that decision because I will not participate in this proceeding beyond the close of business next Friday. That is an enormous strain on me to go that far.

CHAIRMAN COUFAL: I understand.

MR. FOURTELLOTTE: Mr. Chairman, in association with that, may we have the general subject matter that Dr. Timm is going to testify to, so that we can have our experts here to examine his testimony, if we can?

MR. CHERRY: It is in the transcript.

Yesterday it was described. I assumed that Mr. Fourtellotte does what I and the other lawyers do, read

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it every night. If so, he would have found that out.

Thanks very much, Mr. Chairman.

CHAIRMAN COUFAL: Do you represent it is in the --

MR. CHERRY: I made a statement yesterday as to the scope of Dr. Timm's testimony.

MR. TOURTELLOTT: I assume, Mr. Chairman, it don't any more than what is in the transcript of yesterday. And if it is any more, I will move to strike.

MR. CHERRY: Well, you can move wherever you want from here to Montana.

CHAIRMAN COUFAL: Okay, okay.

We will be adjourned until 1:30 Monday.

(Whereupon, at 1:05 p.m., the hearing in the above-entitled matter was adjourned, to resume at 1:30 p.m. on Monday, 7 February 1977, in this same room.)