

REGULATORY DOCKET FILE COPY

NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF:

Cincinnati Gas & Electric Company
(William Zimmer Nuclear Facility)

Docket No. 50-358-OL

Place -

Cincinnati, Ohio

Date -

Tuesday, August 7, 1979

Pages

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UNITED STATES OF AMERICA

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NUCLEAR REGULATORY COMMISSION

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In the Matter of:

Cincinnati Gas & Electric Company : Docket No. 60-358

(William Zimmer Nuclear Facility) :

Courtroom 305

U. S. Federal Courthouse

5th and Walnut Streets

Tuesday 7 August 1973

The hearing was convened, pursuant to adjournment,
at 9:15 a.m.

BEFORE:

CHARLES BECHTOLD, Chairman,
Atomic Safety and Licensing Board

DR. FRANK F. MOOPER, Member

GLENN O. BRIGHT, Member

APPEARANCES:

On Behalf of the Applicant:

TROY E. CONNER, JR., Esq. and MARK J. WINTERBAHN,
Esq. Conner, Moore & Corber, 1747 Pennsylvania
Avenue, N. W., Washington, D. C. 20006

On Behalf of the Nuclear Regulatory Commission Staff:

LAWRENCE BRUNER, Esq., United States Nuclear
Regulatory Commission, Washington, D. C. 20555

On Behalf of the City of Cincinnati:

PETER HERR, Esq.

1 APPEARANCES (Continued):

2 For the Intervenor, Miami Valley Power Project:

3 LEAH S. KOSIK, Esq., 3454 Cornell Place,

4 Cincinnati, Ohio 45220

5 ALSO:

6 DR. FANKLAUSER

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C O N T E N T S

<u>Witness:</u>	<u>Direct</u>	<u>V. Dire</u>	<u>Cross</u>	<u>Ref.</u>	<u>Rec.</u>	<u>Board</u>
William Schwiers)						
Vernon Pence)			2232			
Earl Borgmann)						
Richard Karanen	2262		2263	2308	2423	2404

EXHIBITS:Identified:Rec'd:

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P R O C E E D I N G S

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CHAIRMAN BECHHOEFER: The proceeding will come to order.

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The board has issued an order or is issuing an order today admitting the three new contentions which are before us: two from the City of Cincinnati; one from the Miami Valley Power Project. We established a discovery schedule, and we anticipate that those contentions will be heard at a later session, which we'll have in the fall or winter.

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This morning we anticipated beginning with the witnesses who were on the stand when we adjourned last time, on contentions B and 16.

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But, are there any preliminary matters that any of the parties want to raise

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Mr. Brenner?

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MR. BRENNER: Thankyou, Mr. Chairman.

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I'd like the record to reflect that this morning the staff handed out three sets of testimony to the board and the parties: one is entitled "Staff's Response to the Atomic Safety and Licensing Board's Question Regarding 10 CFR Part 50, Appendix I.

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The second of the three is entitled "Direct Testimony of Thomas Vandel Regarding Pressure Testing of Doors and the Use of Improper Use of Bolts for the Traveling

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1 Screen."

2 The third set of documents is entitled "Direct
3 Testimony of Jack Hughes and Thomas E. Vandel Regarding
4 Electrical Deficiencies."

5 With respect to the first two, the staff would
6 propose to put witnesses on for any questions. They are
7 both followup items, as the board and the parties will
8 recognize.

9 And those witnesses would be available here this
10 week and at the board's convenience.

11 Mr. Britz would be the witness on Appendix I
12 material; he'll be in late this afternoon and will be
13 available as early as tomorrow. I'd like to avoid
14 having to keep him here all week once he arrives, but we
15 can work that out.

16 With respect to the third set, I do not propose
17 to furnish witnesses to be cross examined on this item.
18 This item is a followup to the affidavit of Mr. Blanch,
19 which Miami Valley supplied to the board at the last
20 session. Most of the affidavit, I believe it was ruled
21 by the board -- and certainly viewed by the staff -- was
22 not relevant to any of the contentions.

23 Some of the Blanch affidavit was relevant;
24 regardless, the staff performed a very thorough investigation
25 of the entire affidavit. That investigation is reflected

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1 in an NRC investigation report which is attached to the
2 testimony I indicated.

3 The status of Mr. Blanch's affidavit gets
4 "curiouser and curiouser" as this proceeding goes on: I
5 do not believe that we should get overly technical in
6 administrative proceedings in terms of letting technicalities
7 stop us from getting to the merits of things, but it
8 gets impossible to try a case on the basis of secondhand
9 innuendo and thirdhand hearsay.

10 We have Mr. Blach's affidavit. We went out and
11 looked at it. At that time we believed Mr. Blanch would
12 be a witness sponsored by Miami Valley. Miami Valley has
13 now filed a document entitled "Miami Valley Power Project's
14 Motion to Quash Applicant's Subpoena to Donald Blanch."

15 It's my understanding that the subpoena was never
16 actually served, so technically I'm not sure how it can
17 be quashed. But the heart of the matter --

18 CHAIRMAN BECHHOEFER: The board issued an order
19 some time ago quashing that subpoena. Maybe it didn't get
20 served.

21 MR. BRENNER: All right.

22 The heart of the matter of course is that the
23 applicant and the staff wanted to have discovery of
24 Mr. Blach as long as he was a prospective witness. In fact
25 the staff did have opportunity to speak to him. We

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1 accommodated his schedule. We met with him in the evening.
2 We took him on a tour of the plant along with representatives
3 of the applicant on another evening.

4 All that is documented in the investigation
5 report. The conclusion of the investigation report, I
6 might indicate, is that many of Mr. Blanch's items are
7 not safety related. Some of the items are safety related,
8 but were being resolved independently of Mr. Blanch's
9 allegations.

10 The reason I don't propose to put those witnesses
11 on, I think is very simple: we regard this as something not
12 before the board now that Mr. Blanch has been withdrawn. In
13 that case, the staff has performed its job and has
14 completed its investigation report, and we will make it a
15 part of the record, part of the official record, and in
16 fact, for convenience, we'll bind it in the testimony to
17 serve as a basis, we think, for why Mr. Blanch's
18 testimony was probably withdrawn. My problem is there
19 is at least the implication in Miami Valley's motion that
20 the reason he was withdrawn was because of some sort of
21 time constraints.

22 These have never been spelled out; if it's still
23 their contention -- notwithstanding our investigation report --
24 he has something else he wants to inform this board of
25 that we have not addressed adequately, then I think he ought

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1 to be here so I can question him, find out what it is that's
2 on his mind, and get to the bottom of the matter.

3 In the absence of that happenstance, I'm satisfied
4 that the matter has now been taken care of.

5 MR. CONNER: Mr. Chairman, for the record, I would
6 like to note our filing of our Appendix I response. I would
7 like to thank Mr. Brunner for his comments. We of course
8 are delighted that the inspection by the region III

9 Inspection and Enforcement Section of the Commission
10 checked out Mr. Bianchi's charges and found -- on page 2
11 of the inspection report -- that no items of non-compliance
12 were identified.

13 To us this is merely another example of the
14 inept attacks by the Miami Valley Power Project in trying
15 to delay this case. In any event -- excuse me -- we
16 did mail to the board and parties on August 3, 1973 our
17 response to the board's two questions.

18 I'd just like to have that in the record.

19 CHAIRMAN BECHTOLD: Fine. One -- I have one
20 inquiry of Mr. Conner: we received a supplement, I think
21 58, to the PSAR. I wondered if you plan to incorporate
22 that supplement and future supplements into the record.
23 It does overlap one of the submissions that will come
24 up in the fall. It had security -- change in the security
25 plan --

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2 MR. CONNER: Sir, we will, of course, between now
3 and the end of this proceeding file several more amendments.
4 We would propose to specifically identify any that relate
5 directly to a contention.

6 But a lot of these are simply of course the
7 filing of routine technical information which is not in the
8 contentions.

9 CHAIRMAN BECHHOEFER: I talked about 59 because
10 it had some parts of the security plan being changed.

11 MR. CONNER: The emergency plan.

12 CHAIRMAN BECHHOEFER: I'm sorry: the emergency
13 plan.

14 MR. CONNER: When the emergency plan comes up, we
15 will of course call attention to anything that relates to
16 a contention.

17 At the end of the proceeding we will supplement
18 our exhibit by identifying all the amendments that will
19 have been filed by that time. And I expect there will be
20 several.

21 This is for the record again. The board and
22 parties are being served as those amendments are being
23 generated.

24 MR. BECHHOEFER: Mr. Chairman?

25 CHAIRMAN BECHHOEFER: Mr. Bragg?

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1 MR. BRENNER: Perhaps I left something hanging.
2 I guess I wanted to stimulate reaction from the board. I'd
3 like to have Mr. Hughes go home and just have this investigation
4 report bound into the record as evidence of the investigation
5 for the board that was conducted by the staff.

6 (Board conferring.)

7 CHAIRMAN BECHTOLD: The board would feel that
8 it would like to read the report before it decides whether
9 it would want to ask any questions, and we haven't had a
10 chance to do that yet.

11 MR. BRENNER: Fine. My position --

12 CHAIRMAN BECHTOLD: We will try to do that
13 as early in the week as we can.

14 MR. BRENNER: I appreciate that. My position would
15 be that if the board feels they have questions on the
16 subject, the first witness out of the box should be
17 Mr. Blanch.

18 CHAIRMAN BECHTOLD: Well, the -- what we were
19 thinking about particularly are the parts of the affidavit
20 that related to what Mr. Blanch had to say on -- on the
21 overloading of the cable trays and the parts of his
22 earlier affidavit which we found relevant.

23 That does refer to the issue in contention, and
24 we -- if there is anything more we think needs further
25 development, we will --

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MR. BRENNER: I understand, Mr. Chairman. I'm

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not arguing relevant. I don't want my witnesses cross

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examined on the basis of somebody else's hearsay. If the

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board is interested in it, we should have Mr. Blanch here

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and we should all question him, and then we can find out,

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rather than going about it -- finding out solely what the

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staff think Mr. Blanch wanted to say and then what we

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think the resolution is.

9

However, it's within your discretion, and the

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staff's witnesses will be here until we hear otherwise.

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CHAIRMAN BECHTOLD: All right. And as I say,

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we'd like to read the report first and see whether it

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raises any questions.

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(Board conferring.)

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CHAIRMAN BECHHOEFER: I believe we may wish to proceed with the applicant's witnesses. I believe they're already sworn and Miami Valley was cross-examining.

MR. CONNER: The witnesses are in the jury box in the same position as in the last session: Mr. Pence in the center, Mr. Schwier to his left, and Mr. Borgmann to his right.

You may proceed with cross-examining.

Whereupon,

WILLIAM SCHWIERS

VERMON PENCE

and

EARL BORGMANN

resumed the stand and, having been previously duly sworn, were examined and testified further as follows:

CROSS-EXAMINATION

BY MS. KOSIK:

Q Mr. Pence, you stated in your testimony that the control rods are packed and shipped according to special requirements to ensure delivery in the same condition in which they were shipped.

Would you describe what those special requirements are?

MR. CONNER: If the Board please, I would like to, one, request Ms. Kosik to use the microphone, if she

1 can. We can barely hear her.

2 Two --

3 CHAIRMAN BECHTOLD: I don't think it's
4 working.

5 MR. CONNER: It's working to some extent, but
6 we're having difficulty hearing her, already.

7 Secondly, for the record, we object to HV2P
8 being allowed to use different counsel for cross-examination.
9 Mr. Feldman started cross-examination with these
10 contentions.

11 Thirdly, we object to these over-generalized
12 questions such as the Board sustained at the last hearing.
13 Here again, if they have some specific questions, they
14 should be asked as such; not these generalized "please
15 describe how power was founded and grew over the last
16 hundred years. The time for discovery is over.

17 So we object, and we want to make it clear at
18 the beginning that we object to these very generalized
19 questions calling for every kind of procedure that might
20 be involved in the shipment of control rods.

21 MR. BRENNER: Mr. Chairman?

22 CHAIRMAN BECHTOLD: Mr. Brenner.

23 MR. BRENNER: With respect to the objection going
24 to counsel, I think that is within the Board's discretion,
25 and it seems to me that the earlier cross-examination was

1 solely on qualifications, and it is kind of a readily
2 divisible area, and the staff would have no objection to
3 Ms. Kosik conducting the cross-examination.

4 With respect to the objection of the question
5 being overgeneralized, I think it's a little premature.
6 The question gets an answer. It deserves of course. If
7 you have a general question, you get a general answer.

8 If it goes on like that, I think the objection
9 may become valid and the Board could properly ask where's
10 the cross-examination going, but that is only the first
11 question and clearly it's still in the foundation stage.

12 (Board conferring.)

13 CHAIRMAN BECHHOEFER: At this stage, we will
14 overrule all the objections, but we do expect the questions
15 to get more specific. So you may ask as a foundation the
16 one that you asked, but eventually you have got to get
17 more specific.

18 You may proceed.

19 WITNESS PENCE: Okay, are we operational?
20 We have specific packaging instructions, specific to the
21 control rods. We have special types of defined as to the
22 type of structural support, and how many control rods can be
23 put in a box, things of this nature; that in that way it
24 is specific packaging instruction.

1 BY MS. KOSIK:

2 Q And how do you determine that these requirements
3 were met?

4 A (Witness Pence) This is a part of our normal
5 QC requirements in our Wilmington operations.

6 Q How do you determine that they were met?

7 A I'm not sure I understand what you mean.

8 Q I mean, do you rely on other inspectors'
9 paperwork? Or do you -- Does someone, in person, check
10 the packaging to make sure that it was properly packaged
11 according to these specifications?

12 A We have a regular quality control organization
13 that does inspection of these items.

14 Q Now is that GE that does that inspecting?

15 A Correct.

16 Q And does that inspecting take place at the
17 plant in Wilmington?

18 A Yes.

19 Q How about when they reach the site? Is it
20 inspected there regarding shipping and packaging
21 requirements?

22 A Well, there's an inspection that's done to find
23 out whether there may have been any damage done to the
24 control rods during handling or shipping.

25 Q Now you stated previously that there are 137

1 control rods, plus 5 spares, totaling 142. Did these all
2 arrive at the site in the same shipment?

3 A I am not sure.

4 Q Do you know whether they arrived over a wide
5 period of time? Or within the same general time frame?

6 A Normally, I think they come in in about three
7 shipments over maybe a period of three to five months, and
8 the spares may follow that anywhere from -- along with the
9 latter shipments -- to anything, maybe six to eight months
10 after that, but I'm not sure of the specifics for this
11 plant.

12 Q Do you know how much time elapsed between the
13 arrival of the control rods and the time of inspection on
14 site?

15 A No.

16 Q By the time they were being inspected on-site,
17 were they all -- were all the control rods on site? Or were
18 more coming in?

19 A To my knowledge, they were all on site.

20 Q Were the control rods inspected at the area where
21 they were stored? Or were they brought to another area to
22 be inspected?

23 A I believe they were brought to another area where
24 they were inspected.

25 Q And who performed this inspection?

1 A I believe this was done by subcontractor,
2 Reactor Controls, Incorporated.

3 Q Do you know specifically who performed the
4 inspection?

5 A Names of people, I do not know.

6 MR. CONNER: If the Board please, we would note
7 that Ms. Kosik has addressed her question specifically to
8 Mr. Pence, who is the GE person who manufactures this. She
9 is now asking questions about the inspection that was
10 conducted at the plant.

11 Mr. Schwiers of course is the member of this
12 panel in charge of QA. If she wants to address her questions
13 to the panel, she probably would get answers and save a
14 lot of time. Because obviously this is something not within
15 the purview or knowledge of this individual, while of course
16 it is in the knowledge of the panel.

17 MS. KOSIK: Well, I would request that whoever
18 has the answer on the panel would answer the question.

19 MR. CONNER: These kinds of questions should
20 be to Mr. Borgmann, who is our quarterback witness, and he
21 could then refer it to the person who has the proper
22 answer.

23 CHAIRMAN BECHTOLD: I think that procedure
24 would be satisfactory. I would like to see if -- we're
25 having trouble hearing your questions. Is there any way of

1 setting up the gain on her microphone? Is there any way
2 of setting up the gain on the volume on your microphone?
3 Because we're having real trouble hearing you.

4 (Pause.)

5 CHAIRMAN BECHTOLD: Well, do your best. Just
6 try your best to speak as loudly as you can.

7 BY MS. KOSIK:

8 Q Okay, I'm requesting that the member of the
9 panel who has the answer to the question I'm asking will
10 please answer it; or it's directed to Mr. Borgmann who can
11 then ask the proper person.

12 Did all the control rods arrive in a single
13 shipment? Or did they arrive at the site over a period of
14 time?

15 A (Witness Schwiers) The control rods arrived
16 over a period of time. These are quite large. The boxes
17 are 12 to 15 feet in length. They're packaged three to a
18 box, and with 137 control rods, that means there are some
19 40 boxes. So this -- they could not all be loaded on one
20 truck. So the number of trucks was -- a little louder?
21 The number of trucks was limited as to how many boxes
22 could be loaded per truck.

23 Q Were all the control rods on site at the time
24 the inspection of them began?

25 A Yes, they were.

8 jwb

1 Q Could you describe what type of damage might
2 occur to the control rods, particularly the sheaths, which
3 is what is in question in our contention, due to shipment
4 and handling?

5 A Well, there are supports within the boxes to
6 hold them in place, and there is a cover over each
7 individual seal, and these are secured in place.

8 However, if due to sudden stops, sudden shifting
9 of equipment on the truck, there potentially could be some
10 shifting within the box and potential damage to one of the
11 control rods. So this was one of the purposes of the
12 inspection at the site to ensure that there was no handling
13 damage or shipping damage.

14 It would be apparent in looking at the boxes
15 immediately whether the box itself had been damaged during
16 shipment.

17 Q Our contention specifically regards this
18 thickness of the sheath, and a good bit of the testimony
19 involves the measurements of that. Would that thickness
20 have been affected by shipping damage?

21 A (Witness Pence) Anything like that is possible.

22 Q It's possible, based on the way in which the
23 control rods are packed into the boxes. Is it likely that
24 that particular part of the control rod would be damaged
25 in that particular manner? In other words, would the sheaths,

1 as a result of shipping and/or handling, be damaged such
2 that the sheath would become thicker, or a high point
3 would appear at one point?

4 A If you're asking for which would be most likely,
5 handling damage would be more likely to cause problems
6 there than shipping damage.

7 Q "Handling," did you say?

8 A The handling would have a higher probability of
9 causing damage than shipping would.

10 Q The handling you refer to, is that from moving
11 it from the boxes?

12 A That's correct.

13 Q And would that handling in some way cause these
14 sheaths to become wider than they were at the time they
15 were packed?

16 A Yes.

17 Q Could you describe how that might occur?

18 MR. CONNER: Your Honor, we object to this line
19 of questioning which calls for speculation on the part of
20 the witness. We've gone along with a couple of these
21 questions -- these lines, to try to get it over with, but
22 now they're asking the witnesses to speculate how damage
23 might occur. Here again I believe they should ask
24 specific questions about what did in fact occur, as a
25 factual matter, not calling for speculation from the witnesses.

10 jwb

1 They have already testified once that something is possible
2 in the context that anything is possible. But here we are
3 asked to pursue this line further on speculation as to what
could happen, not what did happen.

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1 CHAIRMAN BECHHOEFER: For the moment we will sustain
2 that objection, but Dr. Hooper would like to ask a question
3 because it might clarify one of the matters that you've been
4 trying to drive at. He would like to interrupt you just for
5 one.

6 DR. HOOPER: I did not understand the answer
7 to one of the interviewer's questions. She posed the question
8 as to whether or not the thickness damage would be the kind
9 that changes in thickness type of damage would be the type
10 that you would expect from a handling or shipping type of
11 accident.

12 That was my understanding of the question. I did
13 not hear the answer to that. Would you help us with that one,
14 please.

15 WITNESS PENCE: My recollection, I think, of what
16 I said was that the handling would have a higher probability
17 of causing that kind of damage than the shipping itself.

18 DR. HOOPER: But handling and shipping could cause
19 a change in thickness of this material, is that your testimony?

20 WITNESS PENCE: Let's clarify the question slightly.
21 It's not the thickness of the material. It's actually what
22 you would call the thickness of the wing.

23 In other words, this is the thickness total of
24 the aluminum skin, plus the thickness of the ribs, what is
25 around the aluminum skin.

1 In other words, I'm not increasing the material
2 thickness itself. It's the composite of these that is referred
3 to as the thickness.

4 In other words, if these parts were hit on the
5 edge, it would cause a dent, and this would cause the
6 thickness of it to increase.

7 DR. HOOVER: All right. Your testimony is then
8 that you could have an accident charge, at least as far
9 as the dent is concerned, the thickness of the rod?

10 WITNESS PENCE: That's correct.

11 DR. HOOVER: All right. Thank you.

12 CHRISTIAN BUCHHEIMER: Continue.

13 BY MS. KOSICH:

14 Q Are you saying then in the course of handling, if
15 the sheath were dented at one point, it would result in a
16 high point elsewhere?

17 A (Witness Pence) Not elsewhere, it would be near the
18 dent.

19 Q But where in relation to the dent?

20 A Well, it would probably be within a half inch
21 of the dent.

22 Q Now this area that I am referring to as the thickness,
23 I assume that you are talking about the part that is supposed
24 to measure .30" thick?

25 A Yes.

1 Q Did this type of damage occur to any of the control
2 rods in question?

3 A Yes, it did.

4 Q At what point did it occur?

5 A I do not know.

6 Q Is any of you know?

7 MR. CONNOR: Objection, your Honor. At what point
8 did it occur? We're talking about a geographic point, a point
9 in time, or a point on the wing, or what?

10 MS. KOSIK: I'm referring to a point in the shipping
11 and handling process.

12 WITNESS FINCH: Nobody really knows at what point
13 in time it occurred.

14 BY MS. KOSIK:

15 Q And you do know that the thickness of the sheath
16 at certain points was increased as a result of handling
17 damage?

18 A Yes. This was found as a result of the inspection.

19 Q How many were damaged in this manner?

20 MR. CONNOR: Your Honor, we object. This is in
21 our evidence in chief. It's already in the record. She
22 hasn't even read our evidence, apparently.

23 MS. KOSIK: Mr. Chairman, the evidence in chief
24 is a series of spontaneous remarks which I am trying to find
25 out what they are talking about and what they said at on.

1 MR. CONNOR: The answer to question 6 is on page
2 2 of the prepared testimony.

3 MS. KOSIK: I'm trying to determine if these
4 matters of dimensional variations occurred as the result of
5 handling.

6 MR. CONNOR: The witness has already said they don't
7 know how it happened. It was found on inspection. Asking
8 these same questions over and over again is hardly productive.

9 CHAIRMAN BUCHHEIT: I think that objection we
10 will overrule. One thing that I see is that there may be
11 12 that had some form of damage, at least six were rejected
12 and six others had minor variations, and Ms. Kosik seems to be
13 exploring that a little bit, and I'd like to know the
14 answer myself.

15 [The record was read as requested.]

16 BY MS. KOSIK:

17 Q There were 26 that were found to be --

18 A (Witness Pence) Which 26 are you referring to?

19 Q The NRC's testimony, which I realize you
20 didn't prepare, but it was stated in there --- I'm looking
21 at it as a whole -- states that the initial inspection
22 report -- I'll find the page for you.

23 A Okay, I know which one you are talking about now.

24 MR. BRENNER: Mr. Chairman, I'm glad the
25 witness knows but I'd like to hear the rest of the question.

1 MS. KOSIK: All right, I'll finish it.

2 BY MS. KOSIK:

3 Q In the testimony submitted by the NRC regarding
4 control rods, on page 4, it says in the initial siting
5 inspection conducted by Reactor Controls, Incorporated,
6 of the 137 control rods, 86 did not pass the 0.280
7 thickness envelope gauge, and you just stated that two of
8 these control rods were damaged in that manner in handling,
9 and I'm asking if that 2 out of these 86 --

10 MR. CONNOR: Objection, your Honor, that
11 question mixes two inconsistent premises. The question
12 was -- the answer to the question was two were damaged
13 in this manner, in response to her previous question
14 as to the manner in which the damage or the dimensional
15 variations were thought to occur.

16 The interrogator is now trying to assume that
17 86 were damaged in this manner, and there is no evidence
18 in the record that 86 were damaged, had that kind of
19 problem or were damaged in that manner. The question is
20 incoherent in that respect, and therefore objectionable.

21 It certainly is not supported by the record.

22 (Board conferring.)

23 MR. BRENNER: Mr. Chairman, I don't understand
24 the question or the objection. I would suggest that
25 rephrasing might help.

1 CHAIRMAN BECHHOEFER: I was going to do that,
2 too. I think the objection is well taken, but I think
3 what you are driving at is legitimate, so why don't you
4 rephrase it? I think you are trying to get what two
5 represents in terms of the totality, so I think that's
6 legitimate.

7 BY MS. KOSIR:

8 Q To any of you who have the answer: Are you
9 aware that the NRC testimony has stated that 86 out of
10 137 control rods did not pass the initial site inspection
11 as required to .280 thickness gauge test?

12 A (Witness Perce) Yes, I'm aware of that.

13 Q Okay. Are you familiar with these 86?

14 A I'm not really sure what you mean by familiar.

15 Q Are you in agreement, let's say, that there
16 were 86 control rods that did not pass the initial site
17 inspection regarding the .280 inch gauge?

18 A I have to ask what you mean by this, not pass
19 the initial inspection. There are a number of methods
20 used in inspection, and the first method that is used,
21 it did not pass. There were 86 of those.

22 Q Then you do agree with the statement in the
23 NRC's testimony?

24 A Yes.

25 Q Okay.

1 Now, the two that were damaged that received
2 damages relating to the thickness which you stated
3 resulted from handling, were these two out of these 86?

4 A Excuse me. You're rephrasing my answer again.
5 You were asking originally about the dent type damage.
6 Now there were two of them out of the 86 that had a dent
7 type of a damage on the edge of the wing.

8 Q Would this dent, which I believe you stated
9 resulted from handling, have caused those particular rods
10 to not pass the .280 inch thickness test?

11 A Yes.

12 Q Now how did the remainder of these 86 get
13 damaged?

14 MR. CONNOR: I object to that question. It's
15 a misstatement of the Staff's testimony, and certainly --
16 there's no evidence in the Staff's testimony that anything
17 was damaged.

18 CHAIRMAN BUCHHOEFER: That was well taken. I
19 think you have to ask a few more questions, lack of
20 foundation.

21 BY MS. KOSIY:

22 Q Does one of you happen to know what was the
23 problem with these 86?

24 A There was no problem.

25 MR. CONNOR: Objection, your Honor. The

1 question supposes a problem with 86. The reference
2 apparently is to the Staff's use of 86 in its testimony.
3 If Ms. Kosik will examine the rest of that testimony,
4 it fully describes the test procedure which shows that
5 86 did not meet the initial part of the test, but then
6 when the test procedure, the next step was applied, I think
7 it's 84 of them or more -- 82 did in fact pass the test
8 at that point.

9 So it's a mischaracterization of the record
10 to pursue this line of questioning, taking the Staff's
11 testimony out of context.

12 MS. KOSIK: The witness stated that he agreed
13 with that statement in the NRC's testimony. I'm trying
14 to discover if this damage did not occur in handling,
15 how it did occur.

16 MR. CONNOR: Objection, your Honor. The Staff's
17 testimony says absolutely nothing about a problem, which
18 is the context of her question, or damage.

19 (Board conferring.)

20 CHAIRMAN BECHTOLD: I think we will allow
21 the question. Not passing is certainly some sort of a
22 problem, not passing the test, so we will see where it
23 goes.

24 MR. CONNOR: If your Honor please, may I
25 object to asking the expert reporters to reword questions

1 Whenever possible, -- we have noticed this in the last
2 hearing and we noticed now when this happened once -- it
3 took approximately 3 minutes and 20 seconds. I timed it,
4 to have the stenomask technique, change the battery,
5 change the record, go back to find it and reread the
6 question.

7 We are certainly not being critical, but it is
8 a problem that we noticed the last time, so I would request
9 in order to speed the hearing along that wherever possible
10 counsel rephrase the question, rather than asking the
11 reporter to do so.

12 I think it would save a lot of time in toto.

13 MS. KOSIK: Well, due to all the objection
14 and what's been stated in between, I would request that
15 the reporter repeat the question.

16 CHAIRMAN SCHMIDT: I think the reporter can
17 get it this time. I think you should try, if you can,
18 to rephrase or reask the question. It might speed
19 things up a little.

20 MS. KOSIK: Except if an objection has been
21 overruled, it's regarding that particular question, if
22 I rephrase it, he then might object to the rephrasing.

23 CHAIRMAN SCHMIDT: As I say on this one
24 the reporter can go back, but actually if you can,
25 rephrase it, and save some time.

1 (The record was read as requested.)

2 BY MS. KOSIR:

3 Q Did you hear the question?

4 A (Witness Penna) Yes, I heard the question.

5 Okay, in the 36 were not damaged, the fact
6 that they did not pass the thickness gauge is an inherent
7 characteristic in the design where the outside sheath
8 is a normally wavy condition, and the fact that it does
9 not pass the initial inspection does not mean that anything
10 has been damaged.

11 The next part of the testing is the time in
12 which examination to see whether there really is any
13 damage to the control rod.

14 Q Is the .280 thickness envelope gauge test
15 also performed at the manufacturing site?

16 A Yes, it is.

17 Q Now what happens if the control rod doesn't
18 pass it there? Does it then get shipped anyway?

19 A No, it doesn't.

20 Q Well, how did 36 get shipped that did not,
21 when they got to the site, pass the .280 inch thickness
22 test?

23 A Part of this is the normal variation in the
24 sheath, and the flexibility of the part.

25 Q Well, did that occur during shipment? Did

1 the sheath change shape during shipment?

2 A That is a possibility.

3 Q I thought you stated that this type of -- I'll
4 call it damage, doesn't occur in shipping, it only occurs
5 possibly in handling.

6 A At that point I was talking about a dent, and
7 also talking about postulated damage to the control rod.

8 Q Would a sheath, as part of the quality control
9 procedure at the manufacturing plant, pass the .280 inch
10 thickness test, and then as a result of shipping and
11 handling, not pass it when it got to the site?

12 A Yes.

13 Q Okay. How would that occur?

14 MR. CONNER: I would object. She's gone over
15 that twice, now. That's the same line of questioning she
16 started off with last time.

17 MS. KOSIK: I seem to have gotten contradictory
18 answers.

19 MR. CONNER: It's not at all contradictory.
20 It speaks for itself. The fact that -- Ms. Kosik may
21 not understand the answer. She may not understand the
22 difference between wings and blades and sheaths. But I
23 repeat, despite the fact that she may not understand it,
24 the record should speak for itself.

25 CHAIRMAN BUCHWALTER: I think we'd like to
hear the answer to this question.

1 DR. HOOPER: I don't understand it, either,
2 so I'm sorry. The witness was not very clear. His
3 answers have been caged quite a while, and we cannot
4 fully understand what he said.

5 MR. CONNOR: Your Honor, the witnesses are a
6 noble force to respond to the specific questions asked by
7 the interrogator. We rely on our evidence in chief and
8 subscribe to the entire matter, as does the staff.

9 DR. HOOPER: It's a matter then of understanding
10 at this time.

11 MR. CONNOR: Surely.

12 WITNESS PENCE: It has a characteristic of
13 being wavy in nature, so that any time there is any
14 flexing of the part, moving of the part, it may have a
15 tendency to be slightly thicker or have a slight bulge
16 in one location and the next time it is flexed, that
17 bulge may be either bulged inward or outward or move
18 to a different area.

19 Now this does not mean that there is any damage
20 to anything. This is just a normal characteristic with
21 the design of the control rod, so that when you check
22 for inspection of the thickness, you are trying to determine
23 whether there was any damage that is a material damage
24 to the sheath or some kind of damage to the absorber
25 tubes or any assemblies that may be underneath the sheath.

1 So it is very probable that you will not be able to pass
2 the .280 thickness over a wing when you did it at the
3 shop and then when you did it at the site. That does
4 not mean specifically that at that point in time there
5 definitely was any damage.

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BY MS. KOSIK:

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Q At what point in the shipping process does this

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change occur?

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MR. CONNER: Objection, your Honor: that has

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been asked and answered and the witness didn't testify

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at all to the shipping process. The witness testified that

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this is an inherent phenomenon of the thickness of the

8

sheath material which will vary because of various thing,

9

simple conditions.

10

MS. KOSIK: I assume something causes the sheath

11

to change its thickness and --

12

WITNESS FENCE: The control rod -- the control

13

rod is very flexible and any kind of jarring or bumping or

14

anything of this nature that happens may break the control

15

rod, flexing it to any extent; whatever that might be, it

16

can cause a change in the sheath waviness.

17

BY MS. KOSIK:

18

Q Okay, it was stated in the testimony that as a

19

result of the inspection at the site, six control rods did

20

not meet the General Electric inspection criteria and were

21

returned and replaced.

22

This non-compliance with inspection criteria,

23

was that determined by means of paperwork from inspections

24

or by in-person inspections?

25

A I don't sure I understood the question.

david2

1 CHAIRMAN RECHIOFFER: Can you try that one again.
2 I'm not sure I understood it.

3 BY MS. KOSK:

4 Q Okay, you stated in your testimony on the
5 first page and running into the second page: "As a result of
6 this inspection, six control rods did not meet General
7 electric's inspection criteria and were re-rod."

8 How was the determination made that those
9 control rods did not meet the inspection criteria?

10 A It was determined by visual examination and by
11 use of the gauges.

12 Q And who did that examination?

13 MR. CONNEL: I object to that, your Honor: that
14 question was literally asked and the witness said he didn't
15 know the answer to that.

16 MS. KOSK: I'm asking anybody on the panel.

17 WITNESS FOREMAN: That inspection was done by
18 Reactor Controls.

19 BY MS. KOSK:

20 Q Do you happen to know who performed that particular
21 inspection?

22 A (Witness Tense) You mean the names of the
23 inspectors?

24 Q Yes.

25 A (Witness Foreman) He do know any of the names of
the inspectors? They were Williamson, Mr. McMartin,

david3

1 Mr. Coyle (phonetic), Mr. Fooley (phonetic), I believe,
2 Mr. Campbell.

3 Some of these people were involved in this
4 inspection.

5 Q Okay. Was Mr. Fooley involved in the actual
6 inspection of these control rods?

7 A Mr. Fooley was the foreman; the actual
8 inspection really was done by quality control personnel of
9 Reactor Controls to determine whether the control rods met
10 the specification requirements.

11 Q These quality control people, are they different
12 from the millwrights you just mentioned?

13 A Yes, they are.

14 Q Could you describe how that process takes place?
15 Do the quality control people themselves pass the gauge
16 over the control rods and then mark down if it passes or
17 not?

18 A That is correct.

19 Q And who are these quality control people
20 employed by?

21 A They were employed by Reactor Controls, Incorporated.

22 Q Okay, what did the millwrights involved do?

23 A They assisted in preparing the control rods for
24 the inspection by uncrating and placing them on wooden boxes
25 to conduct the inspection.

lavid4

1 Q Did the millwrights actually perform the tests
2 with gauges?

3 A They provided assistance as required.

4 Q They did not themselves perform these tests?

5 A The quality control people did.

6 The record of all the dimensions was by the
7 quality control people.

8 Q The recording of the dimensions: how about the
9 actual measuring?

10 A Done by quality control people.

11 Q Were the millwrights provided with these
12 envelope gauges?

13 A The gauges were available for use and as required
14 the quality control people would ask assistance from the
15 millwrights.

16 (Counsel for Intervenor MVPP conferring.)

17 MR. BRENNER: Mr. Chairman, I think it's improper
18 for counsel to be talking to their witnesses while the
19 witness is on the stand or otherwise gesturing or motioning.
20 Some of this has been going on this morning.

21 I would ask the board to direct all parties that
22 it not occur.

23 MR. COOPER: We hold -- if Mr. Brenner is
24 referring to me, I keep telling the witnesses to speak up
25 because the people are not leaning over to hear.

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1 While we're at it, I would also object to the
2 person seated next to Ms. Kosik wiggling and making gestures
3 at the panel and shaking his head violently in response to
4 some answers.

5 I don't know who it is, but it is a distraction. It
6 should not be permitted in a court. I don't think he's
7 one of the counsel.

8 MS. KOSIK: I didn't know shaking one's head was
9 not allowed in a court of law.

10 CHAIRMAN BECHTOLD: I think the board was paying
11 attention to the witness than -- I do think that -- that --
12 well, there's no objection to asking a witness to speak louder,
13 but beyond that, I think the witness should be allowed to
14 answer without coaching.

15 I assume that as long as you're just telling him
16 to speak louder, there's nothing wrong with it.

17 MR. COHEN: For the record, we of course will
18 abide by the presiding officer's decision, but while
19 there are long conferences among counsel who are asking
20 questions, I see no impropriety to saying anything to the
21 witnesses who are on the stand.

22 Certainly they can confer. I know the staff
23 has been paid off at this point over the years to the
24 extent of allowing to separate witnesses. I never have
25 understood it, but let me know what I don't agree that this

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1 is any legal deficiency in counsel conferring with
2 witnesses during the pause for any reason.

3 MR. BRENNER: Well, it may not be paranoia,
4 Mr. Chairman. But you're not allowed to coach a witness
5 in between questions and answers, and while Mr. Conner
6 may have been talking about speaking up at that particular
7 point, some of his and Mr. Wetterhahn's gestures were
8 of significant requests for speaking up this morning.

9 I think the board observed it. Obviously, I
10 don't know anything about what was talked about. I just
11 wanted it to stop.

12 MR. CONNER: I'm glad to see Mr. Brenner admits
13 paranoia.

14 (Laughter.)

15 MR. BRENNER: Just because you think everybody
16 is after you -- just because you're paranoid doesn't mean
17 everybody else isn't after you.

18 (Laughter.)

19 MR. CONNER: Mr. Brenner is probably right on
20 both points in this case.

21 CHAIRMAN BUCHHEISER: I think Mr. Brenner's point
22 is correct. But I do think that the witnesses should try
23 to speak as clearly as they can, certainly.

24 And --

25

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BY MS. KOSIK:

Q Okay, the quality control people employed by Reactor Controls who performed these tests with the gauges on the control rods, what training did they receive to be able to use these gauges?

A (Witness Schwela) I think at this point in time -- I think it would be better to get the Reactor Controls man up here, Mr. Kananen, who is really responsible for the quality control.

We are peripherally acquainted with it. We're not acquainted in detail. So I'd like to get Mr. Kananen up here. He can give you more detailed information and meet the real intent of your questions.

Q Is he one of the quality control people we're talking about?

A Yes, he is.

Q Okay.

CHAIRMAN BOCHNER: Is he here?

WITNESS SCHWELA: Yes, he's here.

(Counsel for Applicant distributing documents.)

CHAIRMAN BOCHNER: Has he been sworn?

MR. CONNER: Yes. May I request this witness be

sworn.

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Whereupon,

Richard Kananen

was called as a witness, and having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CONNER:

Q Mr. Kananen, do you have before you a statement entitled "Qualifications, Richard Kananen, Quality Control Supervisor, Reactor Controls, Inc."?

A Yes.

Q Speak into the mike.

A Yes.

Q And is that statement of your professional qualifications true and correct?

A Yes, it is.

Q Speak into the mike.

A Yes, it is.

MR. CONNER: May I request that the statement of Mr. Kananen's professional qualifications be incorporated into the transcript of the record at this point as it reads.

CHAIRMAN BECHTOLD: Any objections?

MR. KOSIK: I have no objection, as long as I can ask a few questions about it.

CHAIRMAN BECHTOLD: Okay. It will be incorporated as it reads.

Re-direct examination as follows:

QUALIFICATIONS
RICHARD KANANEN
QUALITY CONTROL SUPERVISOR
REACTOR CONTROLS, INC.

My name is Richard Kananen. I am employed by Reactor Controls, Inc. as a Quality Control Supervisor. My business address is Wm. H. Zimmer Nuclear Power Station, Moscow, Ohio 45153.

I attended Bemidji State College in Bemidji, Minnesota from 1967 to 1968. In 1969, I studied at the Naval Nuclear Power School, Bainbridge, Maryland and in 1970 I was at the Naval Nuclear Prototype, Windsor Locks, Connecticut.

I have successfully completed the following courses:

- (1) General Dynamics Programmed Instruction course concerning penetrant testing - 1974.
- (2) Basic Non-Destructive Examination course at the Thames Valley Technical College - 1975.
- (3) Krautkramer-Branson Basic Ultrasonic and Ultrasonic Weld Inspection Schools - 1975.
- (4) Weld Radiography and Film Interpretation (Reactor Controls Inc.) - 1976.
- (5) Ultrasonic Inspection of CRD Housing to Stub Tube Welds (Reactor Controls, Inc.) - 1976 .

I have had approximately nine years of nuclear power plant experience which includes four years of operation, maintenance, and testing of naval nuclear propulsion plants, two years of quality control for commercial nuclear power plant

construction and maintenance at General Electric, and three years of quality control for nuclear power plant construction at Reactor Controls, Inc.

My certifications include, in 1975 - Level I UT SNT-TC-1A, and in 1976 - Level II PT, VT, UT (limited to "C" scan method used by RCI) and RT (limited to film interpretation).

BY MR. CONNER:

Q Mr. Kananen, were you responsible for the quality control inspection of the control rods for the Zimmer Plant as part of your employment for Reactor Controls, Inc?

A Yes.

Q And did you in fact inspect -- and did you in fact supervise the inspection of these control rods at Zimmer?

A Yes.

MR. CONNER: Your witness.

CROSS EXAMINATION

BY MS. KOSIK:

Q Okay. Regarding the qualifications, did any of your studies that are listed here include quality control of commercial nuclear power plants?

A Yes, they did.

Q Which one, specifically, refers to commercial --

A The Naval training, the one year of Naval training.

Q Okay. And how much time did you spend in that particular training?

A One year.

Q Did you receive training in the use of envelope gauges that measure the thickness of control rod wings?

A I did at that time.

Q Did you inspect?

1 A Yes.

2 Q When did you receive that training?

3 A Just before the inspections that we did at

4 Zimmer.

5 Q And who provided that training?

6 A The Reactor Control internal installation
7 supervisor.

8 Q And how much time did that training take up?

9 A It was a walk-through. We discussed it in the
10 shop, and then we walked through with the crew that was
11 doing the inspections.

12 It was probably less than an hour, whatever
13 time it takes -- whatever time it took to walk through a
14 set of inspections.

15 Q I don't exactly understand what you mean by
16 "walk-through with a crew that was performing the inspections."

17 A Well, the millwrights assisted in moving the
18 tools, so they would have been part of the crew that was
19 involved, together with the quality control inspector
20 from Reactor Controls.

21 Q Now, this walk-through, was that the -- during
22 the actual inspection of the control rods in question?

23 A I believe we did a walk-through before we started
24 the actual inspections.

25 Q That material -- what was inspected during this

david11

1 walk-through?

2 A Well, one of the -- we had one of the rods out,
3 and we just -- it was just like we were doing a regular
4 inspection of the rod, only it was just -- it was only just --
5 you know, we only inspected like one blade or two blades.

6 Q Who -- who -- during the walk-through occurring, who
7 was doing the actual measuring?

8 A I don't understand the significance, but at the
9 time it was a group participation function. And I don't
10 remember who. I think -- I think that we went through
11 and everyone took their turn at taking measurements, and --

12 Q I'm sorry, you want to finish saying --

13 A -- No, that's all. I'm finished.

14 Q Since this was training, I assume somebody was
15 showing you how to do what it was you were learning.
16 Who was showing you how to do what you were learning?

17 A As I previously said, Mr. Nays (phonetic), who
18 was the installation supervisor, conducted the training
19 session.

20 (Counsel for Intervenor NWPB conferring.)

21 Q So, Mr. Nays showed you how to use these
22 measurement gauges; is that correct?

23 A That's correct.

24 Q Were the milliwatts -- what were the milliwatts doing
25 during this walk-through?

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1 A I don't remember specifically what they were
2 doing. I -- I don't understand what -- what you'd like
3 to know.

4 Q Well, I wanted to know in that question what
5 the millwrights were doing during the walk through. I mean,
6 were they present during the walk-through?

7 A Yes.

8 Mt. CONNER: We don't even know if they're
9 present.

10 WITNESS KANAREN: Yes, the millwrights were
11 present. The crew that was going to do the work -- the
12 original crew was present at the time of the walk-through.
13 I stated that in my original statement concerning the
14 training.

15 BY MS.KOSIK:

16 Q Okay. So you already stated they were present,
17 but you don't recall what they were doing during this
18 walk through; is that correct?

19 A Well, I would assume that because it was
20 intended to show us how we would be doing inspections,
21 that they would have been the ones that moved -- they would
22 have had their turn at moving the gauges over the blades.

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Q So they were part of the training program that you were also a part of?

A That's a fact.

Q During the actual inspection, after you had been trained to do such an inspection, what role did you play in this inspection?

A I inspected some of the control rods.

Q Now when you say you inspected "some of the control rods," does that mean that you used this envelope guage? Did you pass this guage over those control rods that you inspected?

A The majority of the time the guages were handled by the millwrights.

MR. BRENNER: Mr. Chairman, excuse me. I don't think that was a full answer to that question, for the record. Part of the question was: Did he handle the guages himself, and we didn't get a "yes" or "no" on that.

WITNESS KAMANEN: Yes, I handled the guages myself. But like I said, the majority of the time, the physical moving of the guages was the job of the millwrights. I used them on occasion to go back and recheck certain areas myself.

BY MS. KOSIK:

Q Okay, are you stating that you as a quality control person did not do the actual testing by means of

1 these guages?

2 A (Witness Rannan) Because of union rules on the
3 job site, we weren't allowed -- that was considered their
4 work. So what we would do, what the inspector's function
5 was, was to follow them along the blade. When they
6 encountered an area of resistance, the inspector would
7 investigate that area.

8 Q On how many of the control rods did you actually
9 use the guage to measure the wings?

10 A I don't remember, offhand.

11 Q Did you do any at all?

12 A Yes.

13 Q As the initial inspection? Or as checking after
14 a problem was found?

15 A Both.

16 Q As part of this inspection process, then, is it
17 true that the millwrights actually handled the guages in
18 terms of performing the inspection?

19 A Yes.

20 MR. CONNER: Your Honor, that question has been
21 asked over and over again.

22 MS. KOSTIK: I believe a totally contradictory
23 answer was given by one of the other panel witnesses, and
24 I'm trying to bring this out.

25 CHAIRMAN BECHTOLD: I believe that's correct.

1 Objection overruled.

2 MR. BRENNER: Mr. Chairman, at this time I would
3 like to ask where we're going with all this -- or I'd like
4 the Board to ask where we're going with all this. We've
5 got the direct testimony of the staff particularly, the
6 applicant, also, which describes what happened in the
7 inspection, how many blades were found out of conformance,
8 what was done with those, and so on.

9 We've got the man on the stand who was present
10 during some of it, but some of these, what I thought were
11 just preliminary background details, seem to have taken
12 over the whole cross-examination. And I understand
13 counsel's entitled to develop that cross-examination, and
14 I don't mean to jump in too soon, but I think now is the
15 point to inquire where all this is going.

16 CHAIRMAN BECHTOLD: Could you respond?

17 MS. KOSIK: Our Contention 15 deals with the
18 thickness, particularly, of the control rods, and whether
19 in fact these control rods should have passed the inspection
20 tests that the testimony from the staff and the applicants
21 are stating that it did pass.

22 Whether or not these control rods properly
23 passed depends on whether or not the quality control
24 procedures, both at the manufacturing site and at the
25 Simmer site, were properly performed.

1 And my questions specifically are dealing with
2 the quality control procedures -- namely, the inspection at
3 the Zimmer site -- and who performed these.

4 MR. CONNER: Your Honor, we then object to this
5 entire line of questioning, which is essentially: Were
6 some of the laborers actually performing some of the work?
7 is really all that's being brought out at this point. It
8 has nothing to do with the specifications or how they are
9 met. It has to do with who held the instrument, and how
10 long? And that has absolutely nothing to do with what
11 Ms. Kosik said her contention involves.

12 MS. KOSIK: Mr. Chairman, our direct testimony
13 is testimony from a millwright who was one of the named
14 millwrights by one of the witnesses. Now his testimony is
15 contradictory to what -- to the testimony of the panel.

16 And obviously, as part of the decisionmaking
17 process, credibility of witnesses is going to be in question.

18 MR. CONNER: Your Honor, then this line of
19 questioning is totally improper. Assuming that the -- I
20 guess the gentleman seated beside Ms. Kosik is Mr. Martin,
21 there's no competence to his testimony to determine in any
22 way whether -- what the test procedure should be, or
23 when those specifications are met, has actually no
24 technical qualifications, and that has yet to be developed.
25 But the mere fact that she thinks that Mr. Martin might not

1 agree with the competent engineers has absolutely nothing
2 to do with allowing her to pursue a line of questioning
3 like this which is meaningless.

4 MS. KOSIK: My line of questioning has to do
5 with who did what inspection. That's totally relevant to
6 the direct testimony.

7 MR. CONNER: The witness panel have already
8 testified to the names of the individuals who were involved.
9 Now that's all that needs to be done. Mr. Kananen has
10 said that union rules required that the millwrights be the
11 ones who do the first pass of the guage. Now I don't know
12 what else is needed.

13 I certainly see no point in chewing on this and
14 taking up time, as we did the last two weeks.

15 MR. BRENNER: Mr. Chairman, if I might -- since I
16 started it -- we started this by having the Board ask
17 Ms. Kosik where she's going. As I understand it, she's
18 going after some contradiction between her witness's
19 testimony and the applicant's testimony.

20 The advantage of having profiled direct testimony
21 is, we already know what the testimony says, even if
22 it's technically not in. There isn't one single solitary
23 contradiction between Mr. Martin's testimony and any other
24 testimony, because Mr. Martin's testimony happens to be
25 quite limited in scope. It goes merely to the fact that

1 certain blades did not meet the guage. They were then
2 crated; they were then uncrated. That fact has been
3 conceded in all testimony.

4 The real question is: What is the significance
5 of all this? None of Mr. Martin's testimony goes to
6 that; none of the applicant's testimony attempted to
7 contradict Mr. Martin's statement that some of these --
8 86 in fact -- did not meet the guage.

9 So there is no contradiction. If there is a
10 contradiction, I guess Ms. Kosik should identify what
11 the contradiction is that she has in mind that she's
12 going after. The two testimonies cover completely different
13 aspects.

14 MS. KOSIK: When I mentioned the contradiction
15 most recently I was referring to -- I believe it was
16 Mr. Schwiers who stated that the millwrights did not perform
17 the actual tests; they assisted the quality control people
18 in performing the tests. The quality control people handled
19 the guages.

20 Now the contradiction simply is that Mr. Kananen
21 stated the opposite of that.

22 MR. CONNER: If the Board please, let the record
23 speak for itself. Even if it says what Ms. Kosik says it
24 says, that is not a contradiction. The fact that the
25 laborer had held the tool doesn't mean that he was performing

1 the test. The test was to see how it was done, and she
2 hasn't even talked about the balance of the test, the use of
3 the micrometer and so forth. They're trying to establish,
4 I think, the false premise that the only thing that was ever
5 done was with the first guage that is used in the test, and
6 that is simply not consistent with anybody's testimony, and
7 it is actually a waste of everybody's time.

8 (Board conferring.)

9 CHAIRMAN BESCHHOEFER: I think for the time being
10 Ms. Kosik may continue. At some point, you'll have to start
11 bringing out contradictions, and that type of thing.

12 We do think that the training, or the fact that
13 Mr. Martin went through some of the training, could very well
14 be relevant to his expertise, and the fact that he was or
15 wasn't in this walkthrough and subject to some of the same
16 training that Mr. Kanonen was subject to may well be
17 relevant.

18 MR. BRENNER: Mr. Chairman, I beg you respectfully
19 to keep in mind what we're talking about. We're talking
20 about placing a guage in the shape of a tuning fork over the
21 blade. I submit that you do not need the world's greatest
22 expertise to be able to do it.

23 MR. CONNER: We will stipulate that even a lawyer
24 might be able to use one of these guages without any
25 particular trouble.

1 (Laughter.)

2 MR. BRINNER: I don't know if I'd go that far.

3 (Laughter.)

4 CHAIRMAN BECHHOEFER: Well, presumably you will
5 be getting into what happens after something doesn't pass,
6 and that type of thing, which is eventually where we're
7 going.

8 MR. BRINNER: But that's not what she's asking,
9 you see. I agree.

10 CHAIRMAN BECHHOEFER: That's what we have to get
11 to. But I would aim for that.

12 What we're trying to find out is whether the rods
13 that were finally accepted were properly accepted, so that
14 this is where we ought to be going.

15 BY MS. KOSIK:

16 Q Okay, so as I understand it, it's been stated
17 that the millwrights perform the tests, and the quality
18 control personnel stood by and watched. Is that a correct
19 assessment?

20 A (Witness Benanen) No, that's not a correct
21 assessment.

22 Q Could you clarify or correct it?

23 A The millwrights moved the gauges. They did the
24 physical moving of the gauges when they encountered a high
25 spot. The quality control inspector did investigate the

1 high spots and documented the results.

2 Q Okay. In every instance where a millwright
3 encountered a high spot, was a quality control person called
4 over to investigate it?

5 A He was in the area. There was like four control
6 rods laid out at once, and he was part of the team. The
7 team was composed of like two millwrights working together,
8 or three, or however many were there, and the one quality
9 control inspector. So, yes, he was there with them to
10 investigate these areas of concern.

11 Q Okay, he was there. But did he, in fact,
12 whenever at any time this gauge encountered a high spot,
13 was the quality control -- a quality control person called
14 over to investigate that particular high spot?

15 A I can't say in every case that he would -- in
16 most cases, he wouldn't have to be "called," because he's
17 right there.

18 Q I don't mean --

19 A It's possible that he might of -- there might
20 have been times when he would have been on the other side,
21 and the millwright would have said, "could you please come
22 over here and look at this?" That's a possibility.

23 Q The quality control person then did look at
24 every high spot that was encountered?

25 A Yes, every area that was considered rejectable

1 by the millwrights. Or if the guage did not pass a point,
2 it was the quality control inspector's function to
3 investigate the high spot.

4 Q I realize it was his function. I'm asking you,
5 as one of the people who were there, did you go over and
6 check every high spot ---

7 A Yes.

8 Q --- that was encountered?

9 A Yes.

10 Q Just approximately how many high spots were
11 encountered during this inspection process?

12 A I didn't keep track of the number.

13 Q Okay, so you have no idea at all. Is that
14 correct?

15 A No, not off the top of my head I don't have
16 a number for you.

17 (Pause.)

18 Q Is there any way, in the moving of these
19 guages over the control rod, that a high spot would have
20 been missed by a millwright?

21 A What do you mean by "high spot"?

22 Q We've been talking about high spots, you know,
23 the past few questions, and you've answered my questions.

24 A Well, what do you mean by "high spot"?

25 Q I mean a spot where the thickness exceeds .200

1 inches.

2 2. It's impossible for them to have missed any
3 point that would not physically pass the guage, because
4 they would have had to lift the guage off and move it to
5 another area.

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9 (Pause.)
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1 Q In passing the gauge over the control rod,
2 are you stating that the millwright would have lifted up
3 off the blade and then put it back on beyond that high
4 spot?

5 A (Witness Karanen) Under what circumstances?

6 Q When the gauge hit a high spot.

7 A If the gauge did not pass, if it physically
8 would not move over a point and the quality control
9 inspector was called at that time to investigate that
10 point.

11 Q Then in continuing beyond that point, did
12 the gauge have to be lifted off the blade, or could it be
13 just slid on by the high spot?

14 A Well, you are asking me to make a statement
15 that would cover all situations. There were some situa-
16 tions where it would not pass over the high spot, so
17 obviously it would have had to been picked off and
18 put on the other side. They were also --

19 Q You can continue answering.

20 A There were also situations where the gauge
21 could have just -- there could have been an area of
22 friction which would have been because of the thinness
23 of the sheet, the gauge would have just passed over.

24 Q Now again this is addressed to anybody on the
25 panel who has the answer.

ar 1 The testimony states that on page 1, leading
2 into 2, six control rods did not meet the inspection
3 criteria. What was wrong with these control rods that
4 caused them not to meet the inspection criteria?

5 A (Witness Pence) First of all, I have to ask
6 which six are you referring to, the ones that were
7 accepted or the ones that were rejected and sent back to
8 the shop?

9 Q The ones that were rejected and sent back to
10 the shop.

11 A There was one that did not pass the .260
12 dimension. There were three that did not pass the
13 straightness inspection. There was one that had the
14 back seat, referred to as the seal, that was damaged.
15 Then there was one that actually just had a damaged
16 sheath. It looked like an area had been gouged or torn.

17 Q Now the one that did not meet the .260
18 test, was that just rejected right then and there, or
19 was any further testing done to it?

20 A That one was rejected right then because it
21 was obvious that it had been hit with something.

22 Q Now these problems with the six, would they
23 occur during handling?

24 A We do not know when they occurred.

25 Q Was the nature of the problem with the six

1 such that they might have occurred during handling?

2 A It is possible.

3 Q And these six were then replaced; is that
4 correct?

5 A Correct.

6 Q When did these replacements arrive?

7 A (Witness Borgman) I don't know the exact
8 date. There was still some time to get the shipment
9 together at Wilmington. The dates -- within a short
10 period of time.

11 Q Okay. And who inspected those replacements
12 when they arrived?

13 A Reactor Controls.

14 Q Was that the same people involved in the
15 inspection originally, or was it different personnel?

16 A Same quality control people.

17 Q Okay. Do you know whether it was the same
18 millwrights?

19 A (Witness Kannan) I don't remember at this --
20 I don't remember the dates that the replacements were
21 inspected, so I don't remember offhand whether it was
22 the same millwrights, too, or not.

23 Q Were you involved in that inspection?

24 A I'm not sure if I personally inspected any of
25 the replacements or not.

1 Q In your testimony, it states that six other
2 control rods had minor dimensional variations.

3 First of all, I'd like a clarification that
4 these are the same six that are referred to in the NRC
5 testimony on page 4. Would any of you know that? That's
6 at the bottom of page 4.

7 A (Witness Pence) Where it talks about the
8 remaining six control rods are accepted by the licensee?

9 Q Yes.

10 A That is the additional six control rods.

11 Q Or these dimensional variations, could you
12 briefly describe them?

13 A All of these were localized high spots that
14 originally did not meet the .280 dimension.

15 Q And do you happen to know what caused those
16 control rods not meeting the .280 thickness test?

17 A Not in all cases. One of them had obviously
18 been hit slightly by something. You could not tell
19 what it was.

20 Some of it was just the normal sheath waviness
21 condition. I think that's about the only thing I
22 can characterize.

23 Q Now, then it's stated in the testimony that
24 an engineering analysis was made of these six. What
25 did that analysis consist of?

ar6-5

1 A This consisted mainly of a review of where
2 the high spots were located, what the order of magnitude
3 of the deviation was, and the flexibility that existed
4 in the sheath in that area.

5 Q Were any further tests performed for purposes
6 of this analysis?

7 A What kind of testing are you referring to?

8 Q Well, any kind of testing of those particular
9 control rods as part of the engineering analysis.

10 A There was an additional inspection that was
11 made. Is that what you call testing?

12 Q It could be. Was that inspection with the
13 gauge or with the micrometer or what?

14 A It was done with micrometers. It was also
15 done with a clamp, et cetera.

16 Q Okay, the clamp additionally was used as
17 part of that?

18 A Yes.

19 CHAIRMAN BECHHOEFER: Ms. Kosik, at some point
20 we would like to take a break, when you reach a
21 convenient breaking point in your --

22 MS. KOSIK: Okay. We could stop any time you
23 want to.

24 CHAIRMAN BECHHOEFER: Okay. Why don't we
25 take until 11:30, a 13-minute break.

end 5

(Recess.)

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CHAIRMAN BECHHOEFER: I guess we're ready to
resume.

Continue.

BY MS. KOSIK:

Q Okay. I believe it was stated that as a part
of this engineering analysis, clamps were applied to those
six control rods; is that correct?

A That's correct.

Q And who put those clamps on?

A You mean the names of the people?

Q Well, what were their roles? Were they the
millwrights, or was it the -- the engineers who performed
the engineering analysis?

A (Witness Kumanen) Okay, the Reactor Controls
quality control inspector was in charge of reinspecting
those control rods.

Q Was that after the clamps were put on?

A The clamp -- the putting on of the clamp was part
of the inspection.

Q Okay. Now, these six were inspected, and they
were found to have -- do not meet the specifications, and
then at that point in time were clamps put on?

A (Witness Pence) It's a little bit misleading
here. The clamp is a part of the regular inspection.

Q Well --

david2

1 A So it was used -- the clamp was used on the
2 other 86 also as well as the six that were reinspected.

3 Q When the clamp was initially put on the six as
4 part of that initial inspection, did they measure the .260
5 inches?

6 A That dimension was measured, yes. And that was
7 the point at which it did not originally pass.

8 Q Did they originally not pass? Is that what you
9 said?

10 A Correct.

11 Q Could you -- could you explain how those six
12 differed from those other 86? I'm a little unclear on
13 that.

14 MR. CONNER: Objection, your Honor. We've been
15 talking -- we've got two groups of six here included in
16 the 86. I don't think the question is clear just which
17 six --

18 MS. WOSIK: I'm not talking about the six that
19 were termed -- rejected, returned, and replaced; I'm talking
20 about the six that had minor dimensional variations. I'm
21 trying to determine in terms of the inspection what did the
22 inspection turn up regarding these -- those six with minor
23 dimensional variations that differed from the 86 -- the
24 inspection results on the rest of those 86 that was stated
25 in the NRC testimony that did not meet the .260 inch test.

david3

1 WITNESS PENCE: Let me clarify that a little bit.
2 There was 82 of those 86 originally passed the inspection
3 using the next step in the procedure of using the clamp.
4 There were six that did not.

5 BY MS. KOSIK:

6 Q Okay. Now, that totals 88.

7 A I'm sorry; I guess I was reading the wrong
8 numbers here in the NRC document.

9 (Pause.)

10 I'm sorry. I took the number out of context.

11 (Pause.)

12 I'm going to make a correction on that. Of the
13 total 86, there were 80 of them that -- that passed the
14 inspection using the clamp technique and six that did not.

15 Q Okay, six did not pass using the clamp technique.

16 "Now, I thought you were saying that then these six were
17 subjected to the clamp technique and then they did pass.

18 A That's when the change was made. These were
19 written up on what is referred to as a field deviation
20 request, and there was a modification made after an
21 engineering study to the original inspection procedures.

22 Q So, this process was such that after they found
23 that these six did not meet the specifications, they
24 changed the specifications; is that correct?

25 A I guess it could be interpreted that way.

david4

1 Q Is that your interpretation?

2 A It was done only after a rather detailed
3 examination and checking of what kind of deviations
4 existed.

5 Q So then these six eventually under the field
6 deviation disposition request did pass without further
7 modification to their -- to their shape?

8 A Correct.

9 MR. BRENNER: Mr. Chairman, I'm afraid an
10 erroneous number has cropped up in here which neither the
11 staff's testimony nor Mr. Pence's answers today would support.
12 Suddenly we're talking about six control rods as if there
13 were six that did not pass one or the other of these
14 two gauge tests.

15 That's not correct. If you look at the staff
16 testimony, which I believe Mr. Kosik was using at one point,
17 we've got five of them that failed one or the other of
18 the gauge tests according to our testimony. Four failed the
19 Boeing .320 test, and one failed the .280 test.

20 The six rejected rods -- which do not appear at
21 this point in the staff's testimony -- was rejected, as
22 testified to by Mr. Pence, on the basis of problems with
23 what we've come to call as the "seal."

24 So I think that's another matter. Maybe that
25 will help straighten out the arithmetic.

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WITNESS PENCE: May I make one clarification

on that?

There were a couple of cases -- I don't know the specific details on this -- where a given rod would not pass one gauge in one location and would not pass a different gauge in a different location..

So you may have a slight contradiction, depending on which gauge you're talking about.

BY MS. KOSIK:

Q Does that relate to those six that we're talking about?

A I think we'd have to do some research into the documents before I could make a real good statement on that.

(Pause.)

Q Now, I assume you're familiar with the direct testimony that was presented by -- it hasn't -- it's not in the record yet, but it was submitted on behalf of Mr. Marten regarding some recrating of the control rods.

When did this recrating take place?

A (Witness Karaman) Am I assuming that you're talking about the recrating that was done after the first inspection when the rods were set aside to be reinspected at a later time?

Is that what you're referring to?

Q Yes.

david6

1 A It was done after the original inspection.

2 Q That original inspection, did that include
3 clamping?

4 A In most cases it didn't.

5 Q So, is it true that when the original inspection
6 which was done only with the gauge when it revealed that
7 the thickness was greater than .230 inches, the control rod
8 was then recreated?

9 A In some cases it was set aside, yes. It was
10 what you're calling "recreated," yes.

11 Q Well by recreated, did they actually pack them
12 back up?

13 A They put them back in the original shipping
14 containers.

15 Q For what purpose?

16 A They were being -- I already testified for what
17 purpose.

18 Q Well, would you state it again, please?

19 A To be reinspected at a later time. They were --
20 they were set aside to be looked at to be investigated
21 further.

22 Q Were they going to be sent back to the manufacturer
23 to be inspected?

24 A That hadn't been determined at that time.

25 Q So you don't know whether they were going to be
reinspected at the time or at the manufacturer?

david7

1 MR. CONNER: Objection, your Honor. The witness
2 has testified why they were recreated. The witness -- the
3 interrogator is trying to make him speculate. It's
4 irrelevant in any event.

5 (Board concurring.)

6 CHAIRMAN BECHHOEFER: I think the question was
7 answered actually before; he did testify why he recreated
8 them, so I think the question -- I think he's answered it.

9 MS. KOSIK: Okay.

10 CHAIRMAN BECHHOEFER: The objection is sustained.

11 BY MS. KOSIK:

12 Q At the time that they were recreated, had -- was
13 the clamping procedure known to the quality control people
14 who were supervising the inspection?

15 A Yes.

16 Q But these were recreated before being clamped?

17 A I don't remember in all cases what the -- like
18 I said, some of them had been clamped. Some of them hadn't
19 been clamped.

20 Q Any of those that had already been clamped, were
21 they recreated?

22 A That's what I said.

23 (Counsel for Intervenor MWPP concurring.)

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Q If they had already been clamped and they were rechecked, what was the circumstance they were rechecked at that point? Was it because they still didn't pass, even when they were clamped?

A I already testified to that.

MR. CONNER: Objection, your Honor. The witness testified they were put back in the shipping crates for later reinspection. Now I don't know why this witness -- they keep at it. I mean, they apparently had a theory from Mr. Martin's testimony that putting them back in a packing box means that they were automatically going to be sent back to Wilmington, and the witness has already said that isn't so at that point in time. That's the answer, and there's no use beating on it, so we object to the continuation of this line.

CHAIRMAN RECHHOEFER: I think the objection is sustained.

BY MS. KOSIK:

Q Was the clamping process part of the initial inspection procedure?

A (Witness Pence) Yes. It's defined in the original inspection document.

Q And who actually did the clamping during the inspection?

1 MR. CONNER: Objection, your Honor. This is
2 totally immaterial as to who did put a clamp on, and so
3 forth. I mean, there's no significance shown to this, one
4 way or the other. And the whole examination this morning
5 is primarily turned around the names of individuals who
6 did or didn't do something. There's no materiality to
7 it. If there is materiality to it, I submit the Board
8 should have to require the intervenors to establish this
9 before continuing to waste time on the names of individuals
10 on something that truly doesn't make any difference
11 anyway.

12 MS. KOSIK: I'll clarify the question. What I
13 meant was, when I said "who" was it, was it a millwright that
14 did it? Or was it you yourself as a quality control person?

15 MR. CONNER: May I repeat, it's truly immaterial.

16 (Board conferring.)

17 CHAIRMAN BECHHOEFER: I think that one can be
18 answered. The objection is overruled on that one.

19 BY MS. KOSIK:

20 Q Did you do the clamping? Or did one of the
21 millwrights do the clamping?

22 A (Witness Kananen) There were probably times
23 when the millwright actually put the clamp on. There were
24 other times when the QC inspector put the clamp on. But
25 the bottom line is that the QC inspector was responsible for

she is to. And once the clamp was on, the QC inspector was
 she on that time his measurements, so it's really
 irrelevant whether the clamp is on.

MR. BISHOP: Mr. Chairman, I'm sorry. I know
 this does create a time problem, but can I have that answer
 read back?

THE REPORTER read the record as requested.

MR. BISHOP: Thank you.

MR. BISHOP:

Now are you saying that the millwrights were
 not there at the time the measurements after the clamp is on?

MR. BISHOP: I object. The witness just
 testified that they weren't.

THE REPORTER: All right.

MR. BISHOP: I would like to know if
 the millwrights were at any of the inspections, so I will
 allow the question. Regarding, I'm sorry; ever did any
 of the measurements.

MR. BISHOP: Okay, the answer to that is
 going to be that the answer to the clamping.
 It's possible that the millwright could have been the one
 to do the measurements on various occasions, with the
 QC inspector taking the measurements and taking
 the measurements. The measurements. And the inspector
 was the one who was taking the measurements.

1 (Pause.)

2 BY MS. KOSIK:

3 Q Now in every case, did the quality control person
4 look at the reading on the micrometer?

5 A (Witness Answer) When I was doing the
6 inspections, I looked at the readings on the micrometer, yes.

7 Q Every one?

8 A Yes.

9 Q How many did you actually look at?

10 A What do you mean? How many what?

11 Q How many high laser readings that were close to a
12 result of 18 - did you yourself actually look at?

13 A All of them that I inspected; all the rods that
14 I inspected.

15 Q How many were that?

16 A You mean how many rods did I inspect? 19.

17 Q Out of 137?

18 A That's a fact.

19 Q Who did all the checks?

20 A Jack Verla.

21 Q Do you know whether that person looked at all
22 the rods that were on the micrometers that were put
23 on when the rods were changed?

24 A No, I never did know.

25 Q Did you ever see Mr. Verla? Did you see him?

1 answer. What was the person who you said inspected the
2 ones you didn't inspect? I didn't catch his name.

3 WITNESS KANANEN: Mark Parla, P-a-r-l-a.

4 BY MS. KOSIK:

5 Q When the clamp is put on the control rod and
6 then it's measured, and I assume that if that measurement
7 met the .280 requirement, it was accepted, what happens to
8 the sheath after the clamp is removed?

9 A (Witness Kananen) It returns to its original
10 condition.

11 Q Now when a control rod then had passed the
12 inspection -- this whole inspection process that we've been
13 talking about -- what was then done with it?

14 A It was set into a storage rack.

15 Q Okay, was it installed into the control rod tube
16 guide?

17 A The control rod guide tube was also in the
18 storage rack.

19 Q Well, how long after an inspection when a
20 control rod was found to have passed, how long after that
21 was it before it was actually inserted into the tube?

22 A The time varied.

23 Q I mean, was it done right away? Or did anything
24 else happen to the control rod before it was inserted?

25 A It was cleaned after the inspections were done.

1 Q Okay. And how did they actually get it into
2 the tube?

3 A They rigged it up in the air, and they lowered
4 it into the tube.

5 Q Okay. Now when it was being put into the tube,
6 did it just go in smoothly? Or did it hit into the sides
7 of it?

8 A It was the millwright's responsibility, at least
9 one man to stand on top of the tube to prevent it from
10 banging against the tube. So he was there to guide it into
11 the tube.

12 Q And were the quality control people standing
13 there making sure it didn't hit into the sides?

14 A We performed surveillance. We weren't there on
15 top of the tube at all times, no; that wasn't our function.

16 Q Okay.

17 A The sides of the tubes are smooth. There's no
18 obstructions that, you know, once it gets into the tube,
19 it's just a smooth shot in down.

20 Q Are you aware of any foreign particles shaking
21 loose out of the control rod while it was being inserted
22 into the tube?

23 A Are you asking me, was I aware at the time?

24 Q Yes.

25 A At that time I was being trusted in

1 Q Yes.

2 A No, I was not.

3 Q Did you become aware of that situation later on?

4 A Yes.

5 Q Okay, and what was the result of that informa-
6 tion?

7 A (Witness Vence) After the particles were found,
8 a cleaning process was put into effect.

9 Q So the control rods were removed again from the
10 tubes and cleaned? Is that what happened?

11 A That's correct. I'm not really sure all the tubes
12 were even in -- I mean, all the control rods were in the
13 tubes yet at that time.

14 Q How did you go about getting these foreign
15 materials out of the control rods?

16 A (Witness Kanamori) I believe that's part of the
17 prepared testimony.

18 Q Would you mind answering the question, unless
19 your counsel objects?

20 MR. STONER: Object, Your Honor, regarding the
21 prepared testimony. Obviously if counsel can't read it,
22 let her take a second to read it.

23 MR. BILMER: Mr. Chairman, why don't we get a
24 reference to where in the testimony that question is
25 responded to if that's the opinion.

1 CHAIRMAN BECHHOEFER: Yes. Why don't you specify
2 the part where the particular question was responded to.
3 I think that's a good idea.

4 MR. CONNER: I misspoke. I said that's in the
5 prepared testimony. It's in the answers to interrogatories
6 that we furnished to the intervenors.

7 CHAIRMAN BECHHOEFER: That's not part of the
8 record.

9 MR. CONNER: No, but they have the information.
10 The general question as to what happened is something that's
11 already been put in their knowledge and has been described.

12 MR. BRENNER: I guess that means that the
13 witness' legal objection was incorrect, also.

14 CHAIRMAN BECHHOEFER: I think that if the
15 counsel wants the information on the record, this is about
16 the only place she can get it there.

17 I said, if counsel wants the information on the
18 record that was furnished to her in answers to interroga-
19 tories --

20 MR. BRENNER: I'm on her side on this one.

21 CHAIRMAN BECHHOEFER: I didn't understand that.
22 The objection is overruled.

23 MR. CONNER: The answers in the prepared
24 testimony addressed only the contentions which have been
25 addressed by the Board. This is a matter that obviously is

1 of interest to intervenors, and of course had been covered
2 in the staff investigations, but it is not directly
3 responsive.

4 We have no objection to describing it, but I
5 would ask that counsel try to ask direct questions, and not
6 ask just for general explanations. I mean, we have not
7 made good progress yet, and hopefully we would if
8 specific questions were asked.

9 MR. BRENNER: Mr. Chairman, I must disagree with
10 a small part of that. Mr. Conner stated the staff's
11 investigation covers this. As a matter of fact, at some
12 point today I was going to make the point that none of the
13 staff's testimony goes to that specific matter of the
14 foreign material and the grinding getting into the holes.

15 Mr. Conner is correct that it is not a
16 contention. My recollection is that it came up, perhaps by
17 a limited appearance, perhaps by letter filed with the Board.
18 I'm not sure.

19 I don't know if the Board has directed us to
20 respond or not. In any event, the staff is not prepared at
21 this stage of the proceeding to respond to that particular
22 matter.

23 Some of Mr. Martin's -- or some of the
24 intervenor's testimony does cover that matter. I was going
25 to move to strike it without prejudice, when it came up of

1 the basis that we should hold that over for the next phase.
2 It's not perfectly clear from the way Mr. Pence's
3 testimony is structured, but it may be that some of his
4 discussion of the Japanese experience relates to this
5 grinding. And if that's the case, I would not be prepared
6 to cover that at this point.

7 MR. CONNER: I think we're getting somewhere all
8 over the lot here. I think the intervenor's counsel is
9 still talking about the first inspection and placing them
10 in the tubes. Mr. Brennan has now gone off on the grinding
11 which is somewhat into the future from where we still are
12 as to this point. And in fact, I know the inspectors were
13 there and saw some of this work. So I'm not quite sure
14 what we're talking about here.

15 Nevertheless, it is our view that the contention
16 does not extend to this point, as to manufacture, and there's
17 no foundation for this area.

18 We also would move to strike Mr. Martin's
19 testimony as not germane to this issue.

20 On the other hand, if the Board wants to hear it,
21 let's get it over with now, rather than defer things into
22 the future.

23 (Board conferring.)

end JWB

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1 CHAIRMAN BECKHOFFER: Well, I think the Board
2 would like to hear testimony concerning these shavings
3 or the chamfer that is in the direct testimony of both
4 the Applicant and Miami Valley.

5 We also would like to hear it at this session
6 now. We will consider later whether we will leave the
7 record open on this for the Staff to supplement it.

8 MR. FARNWER: Mr. Chairman, if I might, I
9 understand the ruling that you want to hear it, and I
10 think that's fine, with your discretion.

11 Some of the reasoning that puzzles me a little
12 bit, it's kind of the tail wagging the dog. It's not
13 the testimony that is supposed to determine the scope
14 of the contentions; it's the other way around. People
15 put all kinds of things in their testimony, much of
16 which is not relevant at times.

17 That could be some trouble. All I can say is
18 if you want the Staff's view on that particular matter,
19 we are not prepared to give it at this session.

20 I might inform you that some aspects
21 relevant to this grinding is under some scrutiny. It
22 may reflect a couple of things.

23 It involves some interaction between IE and
24 NRR, and maybe not just specifically Zimmer, but in
25 general a certain check on tolerances for control rods.

1 So we can report on it in the fall. If you
2 want to go ahead with the other parties' testimony, that's
3 fine, but I'm not going to cross-examine on this point
4 on behalf of the Staff, because frankly it's a silly
5 position to be cross-examining before I know what I'm
6 after. I'll have to wait for my own experts to tell me
7 that.

8 MR. CONNER: Your Honor, I would note that
9 the Staff is not unacquainted with what happened here,
10 as Mr. Brenner has already indicated. We have no control
11 over his inability to cross-examine, but I think that
12 we should, if the Board wants to hear this, get it over.

13 I don't believe it's relevant to this
14 contention, and we're going to move to strike, but we
15 have kept the witnesses here, Mr. Pence in particular,
16 Mr. Kanonen from the West Coast, for two full weeks
17 in the last hearing, and now they're back today. We
18 want to get this over, so rather than stand on what I
19 believe our legal rights are, we would rather put this
20 in. We anticipated, of course, this being the Intervenor
21 hearing, that this might come up, and rather than
22 try to, as I say, object to this and take a long time to
23 do that before it's resolved, we would like to go directly
24 into it.

25 I would insist, though, that this is answered

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1 by the interrogatories.

2 Secondly, to move it along, I would prefer,
3 with the Board's indulgence, to ask Mr. Kananen or Mr.
4 Pence first to explain exactly what happened, because
5 we are wasting time with this new structure, on which
6 laborer happened to hold the piece of pipe. So I
7 believe we can save the Board's time simply by asking
8 this gentleman what happened, what was done. They may
9 know all this already, it's in the answers to the
10 interrogatories, so they could go right ahead and
11 check it out.

12 And that starts with the answers to
13 questions 52, 60, and so forth, in our answers to
14 interrogatories. So the Board agrees, I would just
15 want to ask Mr. Pence to just describe this, and maybe
16 we can save a lot of time.

17 MR. BRENNER: Is this the grinding
18 we are talking about?

19 MR. CONNER: We are talking about the point
20 in the testimony that the Intervenor is, as to what
21 happened to these particles of material. I would
22 like the witnesses simply to explain then what occurred
23 in sequence through examination, cleaning, and so forth,
24 and go on.

25 Now, to respond to Mr. Brenner, after that

1 part is done, I have no objection as to describing the
2 transferring that was done, and so forth, simply to get it
3 in, but it's a total waste of time doing this as a
4 type of cross-examination approach.

5 MR. BRENNER: I don't have any objection to
6 that procedure, providing, as I believe is our right,
7 we reserve the right to file any further testimony --
8 you can call it rebuttal, if you want -- on this subject
9 at a later time.

10 (Board conferring.)

11 DR. FANKHAUSER: Mr. Chairman, it seems
12 highly inappropriate at this point to consider this
13 matter, if the Staff has not even examined the question,
14 and I think that without the benefit of the Staff's
15 appraisal of the problem, we will be stumbling around
16 in the dark, and I think the appropriate time would be
17 after the Staff has examined the problem of these
18 metal shavings within the control rods, and at that
19 point then we can consider them in hearings, but I think
20 we may have too -- the many questions that are asked
21 now may be inappropriate, or the proper questions will
22 not be arrived at if the question has not been studied
23 by the Staff.

24 MR. BRENNER: I think that possibility might
25 well occur, Mr. Chairman, it's a question of some sort

1 of notice. Certainly we are aware of the situation,
2 but in terms of offering prepared testimony, I don't
3 believe we are. If we are, I'm incorrect, and I apologize.

4 (Board conferring.)

5 MR. CONNOR: Mr. Chairman, we would note that
6 Staff and now Dr. Fankhauser seems to put the burden or
7 position of having to rule, whether the business about
8 these flecks of material is or is not within Contention 15.

9 Now, for the record, I want to make it
10 abundantly clear that in our view it is not within
11 Contention 15, and there is nothing in Mr. Martin's
12 testimony that would in any way establish a foundation
13 that the existence of flecks of material would in any
14 way impair the ability of the control rods to perform
15 their function.

16 That being so, we think that the argument is
17 clearly immaterial for Contention 15. I feel this
18 should be on the record before the Board rules.

19 DR. FANKHAUSER: I think the
20 appropriate time to decide whether it is material
21 or not was when they submitted their prefiled testimony,
22 and the fact that it is there suggests they thought
23 it was in fact material, and that it is germane to the
24 question.

25 (Board conferring.)

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1 CHAIRMAN BECHHOFFER: Well, the Board does
2 wish to hear the material or the testimony on this, the
3 Board does wish to hear the testimony on the shavings
4 and on the material of these.

5 We analyze Contention 15 is fairly broadly
6 worded. We will reserve -- we will allow the Staff, I
7 should say, to reserve the right to bring in its own
8 testimony. I will not permit myself now to allow
9 them the right to conduct further cross-examination --

10 MR. BRENNER: I'm sorry, I can't hear you.

11 CHAIRMAN BECHHOFFER: The Board does want to
12 hear the testimony. The Board also would prefer to hear
13 it this week, right now, to the extent possible. The
14 Board will allow the Staff to reserve the right to bring
15 in its own witness. At this time we will not decide
16 whether we will allow the Staff to defer its cross-
17 examination.

18 I would hope the Staff would be able to cross-
19 examine the witnesses who were here to the extent
20 possible, but under special circumstances we might have
21 them recalled, if there is further need.

22 MR. BRENNER: Mr. Chairman, I want to make it
23 clear what I had in mind. I can ask a million questions.
24 The problem as I may not have to ask any of them. If my
25 own experts go through the exercise and tell me not to

ar7 1 worry about these million points, because of what
2 their analysis can concisely show, without wasting the
3 record's time. So you're putting me in a spot, whether
4 I either am going to have to ask all the questions I can
5 possibly think of, many of which may turn out to be a
6 nonproblem, if you will, or standing mute now.

7 CHAIRMAN BECKHOFFER: What I am saying is I
8 think we would rather have you -- well, you'll have to
9 make a choice. If there are matters that turn out
10 as a result of further Staff work that we think the
11 same witnesses have to be asked about, you can have a
12 forceful case for bringing them back.

13 MR. BRENNER: Okay. Thank you.

14 CHAIRMAN BECKHOFFER: But I could hope you
15 would try to -- the witnesses are here, and some of
16 them come from some quite far away.

17 MR. BRENNER: You solved my problem. That
18 was the one thing I was worried about.

19 CHAIRMAN BECKHOFFER: We will allow you the
20 right to bring in a further Staff report.

21 MR. BRENNER: And possibly further cross-
22 examination --

23 CHAIRMAN BECKHOFFER: If there are specific
24 questions raised by the report, certainly.

25 And we will allow the Applicants to proceed

1 the way Mr. Conner has suggested. I think that will save
2 time.

3 MR. CONNER: The Board has ruled, then, that
4 this copy is part of Contention 15?

5 CHAIRMAN DECHHOEFER: That's correct. We
6 will allow -- well, we've ruled that we want to hear about
7 the topic. Contention 15 is fairly broad, and whether
8 it specifically is included or not, I would have to
9 check the answers to discovery and that type of thing
10 to see whether they were responding, whether it was --
11 whether or not it was, the Board would like to hear it,
12 and the procedure you suggested is satisfactory.

13 MR. CONNER: All right.

14 DIRECT EXAMINATION (Resumed)

15 BY MR. CONNER:

16 Q Mr. Pence, you have just heard the colloquy
17 that has existed in the hearing room here concerning
18 the findings of flecks or particles of material following
19 the initial inspection at Zimmer of the control rods.
20 Is that correct?

21 A (Witness Pence) Correct.

22 Q Will you state what was done thereafter at
23 Zimmer with regard to the matter of these pieces of
24 material?

25 A Okay. It was decided to do a cleaning

1 process. This cleaning process consisted of using
2 compressed air to attempt to blow out any loose
3 particles, using vacuum cleaners to suck out any particles.
4 Also to rap on the control rods to dislodge anything
5 that was there. To use then little probes to go under-
6 neath the sheath to see if there were any particles
7 under there that could be dislodged. All of this in an
8 attempt to clean out any particles that may be under-
9 neath the sheath.

10 This was found -- the particles were found
11 to exist in the connection between the sheath and the
12 center structural member, which is referred to as a tie
13 rod, and then after this was done, to clean off any
14 oil or anything of this nature. It was wiped down
15 with acetone which is a degreasing agent, and that
16 in essence was the cleaning process that was done on
17 all of the control rods. Even, as a bottom line, even
18 if these particles had not been removed, they would have
19 had no effect whatsoever on safety.

20 Q Was any determination made as to the source
21 of these particles?

22 A Yes. They were a result of the spot welding.
23 When you do a spot welding process, every once in a while
24 you will get small pieces of the material being squeezed
25 out in between the two surfaces of the metal. These

1 have probably the maximum size of probably about 1/16th
2 of an inch wide and maybe an 8th of an inch long, and
3 it's extremely thin, maybe the thickness of a couple of
4 sheets of paper.

5 Q Do you have a sample of the flecks or
6 particles that were found?

7 A Yes, we took samples out of the bottom of one
8 of the -- or a couple of the control rod guide tubes
9 when we noticed them falling down in there, and had
10 them examined, and they were a 300 series stainless steel
11 which indicated that it was not some foreign material
12 that had got into the control rod. And also because of
13 the discoloration of some of the particles, it was
14 reconfirmed that it was a result of the material from
15 the spot welds which we see in all of our manufacturing
16 process of control rods.

17 Q Did you make any determination -- I here hand
18 you a piece of plastic containing a black background
19 paper to which is affixed some masking tape, and ask you
20 if the substance indicated on the masking tape is the
21 sample of particles that you referred to?

22 MR. BRENNER: Mr. Chairman, excuse me. Is
23 this going to be an exhibit?

24 MR. CONNER: We will offer it to the Board
25 and counsel as soon as the witness identifies it.

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1 MR. BRENNER: Is this going to be an exhibit
2 marked for identification and be part of the record?

3 MR. CONNER: We do not intend to offer it as
4 an exhibit because it is a unique, one-of-a-kind thing,
5 but we will display it to the Board to help understand
6 the minuteness of the particles.

7 DR. FANKHAUSER: I wonder if it's appropriate
8 to be using this material before it's been available
9 for inspection by various parties.

10 MR. WETTERHAHN: I'm going to make it available
11 to the Board and parties.

12 MR. BRENNER: Mr. Chairman, I don't have any
13 objection to the use of it. My point in knowing in
14 advance is that indeed if it's not going to be an exhibit,
15 with the record, we'll have to be very careful that
16 the record as well as possible describes what it is we
17 are looking at.

18 (Document handed to the Board.)

19 MR. CONNER: After the Board and parties
20 have examined it, I will be happy to have Mr. Brenner
21 improve upon my description of the document, as soon
22 as they have finished looked at it.

23 MR. WETTERHAHN: Perhaps the other parties
24 can examine it at Staff's table, to shorten the time.

25 (Discussion off the record.)

By MR. CONNER:

Q Mr. Pence, would you indicate if that fleck is one of the flecks that you referred to as being the largest?

Would you show that to Mr. Kananen.

A I think a good sample of the largest one is in the lower righthand corner that someone would refer to as a sample condition.

Q What was -- would you state those dimensions again as they were indicated, please?

A They were approximately 1/16th of an inch wide; approximately 1/8th of an inch long, and somewhere in the neighborhood of 2 to 4/1000ths in thickness.

Q Of an inch?

A Of an inch.

Q Can you state what that is in microns?
4/1000ths of an inch?

MR. CONNER: For the record, the document at the top has the caption "Metal Filings discovered in the Control Rods (Clearance between blade sheath and thierod-resistance spot weld zone) Zimmer 1."

Mr. Pence, would you state what is meant by the parenthetical statement.

A The clearance between the blade sheath -- that's the 30/1000ths thick material sheath -- is spot welded to

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1 the center cruciform shaped metal which you might call the
2 structural member of the control rods that he's referred
3 to as a tiered.

4 This is all described in the FSAR if somebody
5 would like to look at some of the pictures.

6 And around this spotwelded zone was where these
7 particles were found.

8 MR. CONNER: If the board please, we have no
9 objection to putting this in the record, recognizing
10 it is a unique document or exhibit, which is not susceptible
11 to copying. These little flecks on here were
12 obviously not made with the intention of providing an
13 exhibit in a hearing.

14 They were simply put there by the people who
15 did it at the time to show samples of what occurred, and
16 under these conditions were quite willing to put in as an
17 exhibit -- although I doubt that it's really necessary
18 because the board and parties, having seen it visually,
19 we've accomplished our purpose of giving you a visual
20 idea of what exists.

21 MR. SPENNER: Mr. Chairman, from the staff's
22 point of view I don't think it's necessary, unless you want
23 to give us one fleck each and three flecks to the reporter.

24 As Mr. Conner pointed out --

25 MR. CONNER: Even the Commission's rules provide
some flexibility for applicants, if not to the staff.

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1 DR. FANKHAUSER: I would think that the exhibit
2 is of little use because there's no way we can know whether
3 in fact these are representative of the flecks that were
4 found.

5 They're of no use.

6 MR. CONNER: The only other reason I can think
7 of for putting it in is it's always possible the appeal
8 board might want to have the same opportunity to
9 examine the sample.

10 MR. BRENNER: I have a suggestion, Mr. Chairman;
11 if Mr. Conner, through his client or himself, can just
12 commit to preserving it, if it should come up later, it
13 will exist.

14 CHAIRMAN BECHTOLD: Does counsel --

15 MR. CONNER: I'm glad Mr. Brenner has more
16 confidence in our ability to preserve it than the Commission.

17 MR. MOSIK: I see no necessity to admit it into
18 the record, and I would agree that we don't really know
19 where these pieces of material came from.

20 CHAIRMAN BECHTOLD: I think --

21 MR. CONNER: The witness already testified to
22 it.

23 CHAIRMAN BECHTOLD: Yes, I think we will not have
24 it admitted.

25 We would hope that the applicant someplace will

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1 try to preserve it in case the appeal board wants to look
2 at it.

3 MR. CONNER: If the board please, we would now
4 go into the area identified by Mr. Brenner as to the
5 chamfering work that was subsequently done in an
6 effort to get it all in in one place and try to dispose of
7 it as quickly as possible, if that's agreeable.

8 CHAIRMAN BECHHOEFER: I just would like to find
9 out how long it would take because we're getting close
10 to a time when we ought to break for lunch. Is it --

11 MR. CONNER: Here again, this information has
12 been provided, I believe, in responses to interrogatories,
13 so simply what we're doing is saying what should be well
14 known to --

15 CHAIRMAN BECHHOEFER: I want to figure out how much
16 time it would take.

17 MR. CONNER: I would guess five minutes.

18 CHAIRMAN BECHHOEFER: Go ahead. Proceed.

19
20 Q Following the cleaning and the returning to the
21 sheaths of the control rods that you have just described,
22 will you state what was next done with regard to the
23 control rods?

24 A (Business pause.) Okay. A period of time after
25 this cleaning process was taken care of that I had mentioned

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1 before, a problem was encountered in one of our foreign
2 plants of a tolerance condition that showed a minor
3 interference between a ledge on the velocity limiter,
4 which is located at the bottom of the control rod, and
5 the bottom edge of the fuel channel.

6 Q May I interrupt you just for a minute. It's
7 my fault; I asked you the question sequentially.

8 Didn't the NRC inspectors want to examine those
9 six control rods as the next step after the first inspection
10 which was then followed by the chamfering that you described?

11 A Yes, that was one other intermediate step there;
12 there was reinspection that took place of the six control
13 rods that had been accepted at one point in time.

14 DR. FANKHAUSER: Is this -- I don't see how this
15 relates to the chamfering. Are we going back now to talking
16 about irregularities in the control rods. It's the same
17 issue. I don't understand the point of the question.

18 MR. CONNER: For Dr. Fankhauser's benefit,
19 and so the record is not messed up, I want to show the
20 first thing that was done was the arrival inspection followed
21 by the cleaning which was described. Six rods were then
22 taken out for inspection so the NRC inspectors could look at
23 them.

24 Then we come to the area that Mr. Ponce is now
25 describing, which led to the chamfering.

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1 BY MR. CONNER:

2 Q Would you continue your --

3 CHAIRMAN BECHHOFFER: I think it's useful to have
4 it all in one place.

5 MR. CONNER: That's what I wanted to do.

6 (Witness panel conferring.)

7 MR. BRENNER: Mr. Chairman, I don't want to
8 belabor this because I don't think it's important, but
9 if I heard Mr. Conner's summary right, in setting up
10 the chronology, he's stating that inspection was done before
11 the chamfering. I don't know whether it's important, and
12 I'm not sure it's correct.

13 CHAIRMAN BECHHOFFER: You may cross examine on
14 that.

15 MR. CONNER: Well, that's --

16 MR. BRENNER: It's unimportant.

17 MR. CONNER: It really is unimportant, but I
18 don't want the record to be misled by my mistakes. If
19 I make two of them in a row, I apologize.

20 WITNESS BRENNER: Excuse me. Let's correct one
21 thing. We've discussed some chronology here and the final
22 inspection of these six rods by the NRC was done after the
23 chamfer modification was made on the control rod velocity
24 limiter.

25 MR. CONNER: Fine. I apologize for interrupting

david7 1 and I'll let you proceed then with your description of
2 what occurred which led to the chamfering.

3 WITNESS PENCE: Okay. As a result of our
4 examination in one of our foreign plants we then instituted
5 a requirement that we examine each control rod to make
6 sure that this maximum material tolerance condition did
7 not result in an interference with the fuel.

8 Now, we sent equipment out to the site, some
9 inspection gauges along with some tools, to do the work.
10 And they -- the ledge that is on the velocity limiter was
11 chamfered by a hand-held grinding technique.

12 And then it was wiped clean and then put back in
13 the storage area.

14 BY MR. CONNER:

15 Q What cleanup technique was used, the same one
16 as previously?

17 A No, because we did not feel that there were
18 any particles that got in. We did take care to cover up
19 the holes in any areas so that particles could get into
20 the control rod.

21 And so the similar type cleaning that we did
22 before was not repeated.

23 Q Does that complete your answer?

24 A Yes, I think at this point that's all that I have.

25 Q The rods are now physically in the core of the

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1 reactor; is that correct?

2 (Witness panel conferring.)

3 A Yes, they are presently in the vessel in the
4 control rod guide tubes.

5 MR. CONNER: Your witness.

6 CHAIRMAN BECHHOEFER: I think at this stage it's
7 a good time to break for lunch.

8 Let's start at 2:00 o'clock.

9 (Whereupon, at 12:40 p.m., the hearing was
10 recessed for lunch to reconvene at 2:00 p.m. that same day.)
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AFTERNOON SESSION

(2:05 p.m.)

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CHAIRMAN BECHHOEFER: The proceeding will come to order.

Before lunch we were handed copies of a motion of Miami Valley Power Project to delay delivery of fuel to the Zimmer site.

Now, I am not certain of our jurisdiction even to entertain this motion, but I would like to -- have the applicants and staff seen this motion?

MR. CONNER: If the board please, we were handed this this morning just before the hearing began. No, it was before the recess.

And we looked at it. I don't think it's appropriate to take up the time in an evidentiary session to argue a procedural motion, and this is of course a very serious question of whether this has anything to do with this hearing and this proceeding, inasmuch as it's a separate licensing action which was already executed by the Commission and delegated authority under the Office of Nuclear Materials Safeguards.

CHAIRMAN BECHHOEFER: I think we all received copies of the Part 70 license.

MR. BRENNER: Mr. Chairman, if I might, that microphone is distorting rather than transmitting.

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CHAIRMAN BECHHOEFER: The one question I had was that I would just as soon receive written responses to this motion, but I would like to know when the fuel is actually going to be shipped.

MR. CONNER: I don't know is the short answer to your question. And because of the indicated civil disturbance that has been suggested by the people on the Missouri Valley Power Project, and perhaps others, I do not believe this is something that this board should discuss in a public forum.

This is -- there have been statements made as reported in the press that are simply not conducive to the properation of an NRC licensing function.

And I just don't think that's an appropriate inquiry.

CHAIRMAN BECHHOEFER: I have not seen the press reports, but be that as it may, I -- the only thing I wanted to find out is whether, if we asked the parties to brief the jurisdictional subject, whether the fuel will be shipped in the interim.

That was my only concern, because this would become moot, this motion, if the act were already done.

MS. ROSIN: Mr. Chairman, may I first respond to a remark that the witness made. First of all, the name of our party is Miami Valley.

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MR. CONNER: Correct.

MS. KOSIK: Secondly, Miami Valley has not made any statements about civil disturbances, and I -- if Mr. Conner is going to make remarks like that on the record, I'd like to have a basis for that because this is just lies as far as I'm concerned.

I don't know anything about this, and I'd like him to be a little more specific on the record.

CHAIRMAN BECHHOEFER: Mr. Brenner.

MR. BRENNER: Mr. Chairman, this is -- I don't want to argue the motion today, but I would like to handle it orally on the record this week, tomorrow if you like. This isn't a case of first impression with respect to the board's jurisdiction over this license.

This Commission precedent that covers it -- and I think the guidelines -- will be fairly clear; as to your concern that events could possibly overtake the request for relief, I think that's a very valid concern. And -- but I also agree that I don't think we should even be discussing dates or times on the record.

Maybe we could do that off the record at a bench conference.

In addition, I would indicate that the NRC staff is sending a document -- I believe it will be in letter form -- to the applicant today which has relevance to this

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1 subject. I should be receiving a telecopy here sometime
2 this afternoon.

3 If so, I'll endeavor to make copies and distribute
4 them to the board and parties.

5 (Board conferring.)

6 MR. BRENNER: But in terms of time frames, I think
7 we could discuss that off the record. I've got some
8 information. I'm sure Mr. Conner has some information.

9 CHAIRMAN BECHHOEFER: Okay, why don't we go off
10 the record.

11 (Bench Conference.)

12 CHAIRMAN BECHHOEFER: Back on the record.

13 I think Ms. Kosik will resume her cross
14 examination.

15 DR. FANKHAUSER: On the record. Well, I would
16 just -- I'm not certain what this was, but I would like to
17 go on the record as joining Miami Valley Power Project in
18 their motion.

19 MR. HEILE: Ms. Kosik, wait a moment, please.
20 The City of Cincinnati would like to review the motion, and
21 I don't think we're in a position as to whether -- as to
22 the nature, I guess, of our approach to the motion.

23 However, I'm sure we will be prepared to do so
24 by later in the week. Thank you.

25 CHAIRMAN BECHHOEFER: Fine.

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MS. KOSIK: Shall I continue with my examination?

BY MS. KOSIK:

Q Okay, stated in the direct testimony, on page 2 of that testimony --

(Pause.)

As stated in the testimony, the control rod is designed to operate with substantial rubbing friction between -- between the control rods and the fuel bundles, which is substantially in excess of 40 pounds.

Now, does this rubbing friction occur under all circumstances, no matter what the dimensions of the sheath are?

MR. CONNER: We would again request that when the witness states statistics or some parameter or criteria she cite the reference to it so the witnesses --

CHAIRMAN BECHHOEFER: I think she read the sentence and gave the page.

WITNESS PENCE: In answer -- in answer to that -- is this coming through?

In all normal cases there is rubbing friction. Now, if everything is aligned just right, we might get some instances where there is very little friction involved. But under normal circumstances there will be a substantial amount of friction in rubbing.

DAVID6

BY MS. KOSIK:

Q Now, will there be more rubbing friction if these high points -- these high spots exist on the sheaths?

A It is likely, but it is not definite that that occur.

It depends on what the actual spacing between the fuel is.

Q Okay. Now, you -- we talked about using a clamp as part of the inspection process, and then the field deviation disposition request made some changes.

Is it true that that -- one of the changes was that the clamp would be placed over the high spot?

A That's correct.

Q Okay. Now, how do you measure the high spot when a clamp is over it?

A You measure the difference between the deflection of the area right next to the clamp. Then you check to see whether that difference is sufficient to bring the high spot below the acceptable level.

Q So you're -- you're not measuring the high spot itself.

A That's correct. You're measuring the deflection right next to the high spot which will be something less than the deflection that is occurring right on the high spot.

david7

1 So, there is a conservatism in that calculation.

2 Q And what do you use to make that measurement? Is
3 that the micrometer?

4 A Correct.

5 Q Now, in regard to the metal shavings and cleaning
6 out of those metal shavings, did any -- did any of this
7 cleaning take place after the control rods had been inserted
8 into the tubes?

9 Were they ever removed and cleaned again?

10 A The cleaning process we did to remove the -- any
11 of the small particles on there was -- no, no recleaning
12 like that. There was some cleaning to remove tape adhesives,
13 things of that nature, after we did the grinding on the
14 velocity limiter.

15 Q Now, you stated that as part of the cleaning
16 technique was -- I believe you put it -- rapping on the
17 control rods; is that correct?

18 A Correct.

19 Q Could you explain what you mean by that?

20 A Yes. The way this was done is we took some --
21 some pieces of rags; we wrapped them in what is normally
22 referred to as gray tape and used this as like a light
23 mallet type of thing to rap against it, like using a soft
24 material so we didn't do any damage to the blades; that
25 would jar any of these particles loose.

david8

1 Q Did you then after that again measure the
2 thickness of the sheaths?

3 A (Witness Kananen) We spot checked approximately
4 half; the blades were -- as the blades were sitting on the
5 inspection blocks, you can get the top two blades, so we
6 would just run over the tops.

7 So we inspected approximately half of the
8 blades afterwards.

9 Q When you say you "ran it over the tops," what
10 did you run over the tops with?

11 MR. CONNER: May I ask that the witness be allowed
12 to finish his answer before the next question is given.

13 WITNESS KANANEN: The gauge is --

14 BY MS. KOSIK:

15 Q How about inspection of the -- reinspection of the
16 thickness of the sheaths by means of a micrometer? Did
17 you use that after the -- after rapping on the control
18 rods?

19 A We didn't find any projectionable areas beyond
20 which anything different from the first time around; in
21 other words, we didn't find any rejectable control rods
22 in the cleaning operations.

23 (Counsel for Intervenor MVPP conferring.)

24 MR. BREMER: Mr. Chairman, while there's a lull
25 in the record, just to make use of time, I located the

david9

1 citation to the Commission's Diablo Canyon case; as I
2 said, I'll endeavor to get a copy telecopied, but should you
3 or other parties have other resources, I'll give it.

4 The Commission decision is CLI 76-1, which may
5 be found at 3 NRC 7, which is a 1976 decision.

6 My recollection is the appeal board decision
7 preceded that Commission decision by a very short time
8 period. So it would be either also at 3 NRC or at the
9 end of 2 NRC.

10 BY MS. KOSER:

11 Q Now, were any of these metal shavings left
12 remaining in the control rods after all of these cleaning
13 processes?

14 A (Witness Koser) Very possibly.

15 Q You state that there is no effect on safety by
16 their existence there; is that correct?

17 A Correct.

18 Q Is it the case that water flows through the control
19 rods?

20 A Yes, yes, water does flow through the cooling
21 holes in the sheath, an inflow from one cooling area to the
22 next and can flow past the absorber tubes and outside the
23 other side of the control rods.

24 Q Now, would this water as it's flowing dislodge
25 some of these particles and carry them along with it?

david10

1 A That is possible.

2 Q And could these particles then go through a pump
3 or a valve or something like that?4 A There are filters before any of the components
5 that would have any problems with any kind of particles.

6 Q How large are the holes on the filters?

7 A Most of them are either 49 or 50 microns.

8 Q Is that smaller than these particles?

9 A Yes, it's more like dust.

10 (Counsel for Intervenor NVPP conferring.)

11 MS. KOSIK: We have no more questions right now.

12 (Board conferring.)

13 CHAIRMAN TECHHOEFER: I guess -- I guess

14 Dr. Fankhauser would be next.

15 There's no particular order, but --

16 MR. BRENNER: Mr. Chairman, I'm not sure if
17 you ruled as to whether other parties have an interest
18 within the Prairie Island test on this convention. I
19 might, if you want to hear from me, state briefly what my
20 view of Prairie Island is, unless you've made up your
21 mind that for the assistance of the board you want the
22 other people to question.

23 In that case, I'll save my speech.

24 CHAIRMAN TECHHOEFER: Well, it's my impression
25 that any intervention who have interest in safety matters can

davidll

1 cross examine on other safety matters, and this is one of
2 them.

3 Mr. BRENNER: Well, you see, it's my belief
4 that if that's the view of Prairie Island, then you don't
5 need any contentions and the contention requirement makes
6 no sense because all parties admitted to a proceeding have
7 some interest or they wouldn't be here.

8 And I think Prairie Island can be read to state
9 that you look at the contentions that the other parties
10 and to the extent the contentions might overlap the issue
11 that you're currently litigating, you might allow them
12 to cross examine.

13 DR. FAKENHUSER: Mr. Chairman, according to
14 precedent that's been set in this hearing itself, other
15 parties have been permitted to cross examine relating
16 to contentions that are not their own.

17 I see no reason why we should change now.

18 CHAIRMAN SECHINGER: Well, the rule is that the
19 other parties have to have an interest; as I say, it's
20 interest in the safety of the reactor.

21 Mr. BRENNER: Perhaps, if I might -- I don't
22 intend to press the point fully so as to cut them off
23 completely if you wish to hear them, but I ask plaintively
24 that the board keep in mind that these are not the parties
25 who have propagated the contention, and therefore you might

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1 have greater leeway in cutting out the cross examination
2 if you think it's not going anywhere.
3

4 CHAIRMAN BECHTOLD: Well, that -- we recognize
5 that, I think. Dr. Farkhauser has a sufficient interest
6 in the safety issues to justify him starting anyway.

7 MR. BRENNER: I will concede he's interested in
8 safety issues. I'm not sure that is the best, but I
9 certainly agree with the premise.
10

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MR. CONNER: For the record, this is the
Chair's ruling, that any intervenor who has obviously been
shown to have an interest be permitted to be an intervenor,
has a discernible interest within the meaning of Prairie
Island, so that he will be permitted to cross-examine on
all contentions? If so, I want to object to it.

CHAIRMAN BECHHOFFER: Not quite.

MR. CONNER: And make a general objection to it
to cover the whole thing.

CHAIRMAN BECHHOFFER: Not quite. It may work
that way at this proceeding, but an intervenor who is
interested in transmission lines, for instance, 50 miles
from the reactor, would have been allowed to get into the
proceeding, might not have an interest in the safety issues
that somebody living close to the plant could raise.

So I'm not ruling -- maybe in this case it is a
general ruling. Generically, it is not. As I say, if an
intervenor came in on transmission, he lived 25 miles away
but is very close to a transmission line, he could get in on
that one contention, but he probably could not get in on
general safety or environmental issues.

MR. CONNER: Mr. Chairman, if the chair allows
Miami Valley whose only interest is on the need-for-power
type thing a long way off, to cross-examine on Appendix I
material, I can't --

1 CHAIRMAN BECHHOEFER: But Miami Valley has
2 subsequently shown that it has members living close to the
3 reactor -- close enough to the reactor, within 50 miles
4 of the reactor site, which is the safety limit.

5 MR. CONNER: Is the Chair ruling that no
6 threshold determination need be made by the Board before
7 cross-examination by intervenors on other contentions is
8 permitted?

9 CHAIRMAN BECHHOEFER: Well, in the context of
10 this case, I would say all of the intervenors have
11 sufficient interest to cross-examination -- to cross-examine
12 on all the contentions that have thus far been admitted.
13 That might not apply across-the-board, as I tried to
14 explain, but in this case it probably does, given the
15 contentions that are already in the case.

16 MR. CONNER: You have ruled that it applies
17 across-the-board in this case, however? Is that correct?

18 CHAIRMAN BECHHOEFER: That's correct.

19 MR. CONNER: Fine.

20 CHAIRMAN BECHHOEFER: I did not intend to
21 imply, through the example that I just mentioned, for
22 instance -- in this case.

23 You may proceed.

24 MR. FINKELBERG: Thank you.

25

1 BY DR. FANKHAUSER:

2 Q I would like to pursue a little bit the question
3 of how crossing the two-thirds of the control rods were
4 shipped, and upon inspection on the Zimmer site found to
5 be oversized -- that is, greater than .280/1000ths of an
6 inch, I wonder whether the manufacturer has had experience
7 with this type of problem before? Or whether this is the
8 first time that a manufacturer, this particular manufacturer,
9 has shipped control rods which were apparently inspected
10 before they were shipped, and to find that two-thirds of
11 them had somehow changed their dimensions upon receipt.

12 MR. CONNER: Objection, your Honor. This is
13 irrelevant. We are here to discuss Zimmer control rods,
14 and there is no basis for it because Dr. Fankhauser wonders
15 about it, for expanding the scope of the contention to
16 include what might or might not have happened elsewhere.

17 DR. FANKHAUSER: Mr. Chairman, for one such as
18 Mr. Conner who seems to be so interested at some points in
19 proceeding expeditiously, I hope he will permit an orderly
20 question to occur such that we can get some facts out that
21 I think are very pertinent, and that we do not have this
22 continual disruption of questioning of this witness. We've
23 seen this before, and I hope the Chair will admonish him to
24 reserve his objections for those issues which are
25 substantive.

12-4 jwb

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MR. BRENNER: Mr. Chairman --

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(Board Conferring.)

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MR. BRENNER: Mr. Chairman, I wonder if I might be heard on the objection? It seems to me that the witness testified that this was "normal." And if that's his testimony, the question is perfectly reasonable to probe that.

CHAIRMAN BECHHOEFER: Yes, I think at least this question. I would overrule the objection. You may answer.

WITNESS PRICE: Okay, the 80 control rods were a normal type condition. In other words, the fact that they did not pass the initial .280 gauge did not mean that those control rods were different than when they left the factory, because we use the same inspection techniques, we use the same inspection clamps, to eliminate the normal weightiness of the sheaths. This is a normal design condition.

The only ones that were outside the inspection parameters were the six that were written up on the field deviation.

MR. BRENNER: Mr. Chairman, excuse me. That's not responsive to the question. The question was: Has this occurred before with respect to other manufacturers or this manufacturer in other instances?

CHAIRMAN BECHHOEFER: I thought it was this manufacturer.

12-5 jwb

1 MR. BRENNER: All right.

2 WITNESS PENCE: I'll continue it, then.

3 CHAIRMAN BECHHOFFER: Right.

4 WITNESS PENCE: Zimmer is the fifth site that
5 we've supplied control rods to that were identical to this.
6 And in all cases, we have this condition.

7 BY DR. FANKHAUSER:

8 Q Do you have this condition in the same proportions
9 as you have here? In other words, you have a majority of
10 the control rods, which as you have stated, you are using
11 identical criteria for judging the rods at the site of
12 manufacture, and they are identical to the mechanism that
13 are used to judge them on site, and you continue -- can you
14 find elsewhere that more than half of the rods arrive with
15 dimensions that are different from what you sent them? Is
16 that correct?

17 MR. CONNER: Objection, your Honor. That
18 misstates the testimony of the witness' last answer. The
19 witness said they might have left the plant in exactly the
20 same condition as they were measured by the first pass of
21 the machine; not that they were changed; not that they were
22 different on arrival at the plant.

23 DR. FANKHAUSER: Mr. Chairman, I'm having
24 difficulty in understanding the answers that are being
25 delivered, and I don't help for us to have superfluous

1 objections.

2 CHAIRMAN LECHHOFFER: I think the relevant
3 answer would be whether or not the two-thirds percentage
4 is in line -- whether the other plants had other comparable
5 percentages. I think that's what Dr. Fankhauser is trying
6 to drive at.

7 WITNESS PENCE: I don't know any of the specific
8 numbers as to what percentage were in this kind of
9 condition. We don't normally get that reported to us from
10 the sites. I do know that that percentage is not unusual
11 for what we would see in the manufacturing facility.

12 BY DR. FANKHAUSER:

13 Q And did your corporation apply these same
14 techniques specifically -- the technique of the clamping --
15 on all five previous plants? Or was this an extraordinary
16 technique that was used in the Zimmer instance?

17 A (Witness Pence) No, that's standard procedure
18 in all plants, or all manufacturing.

19 Q Could you give me some dimensions on the face
20 of the clamp that we understand is a 40-pound clamp? What
21 are the dimensions of the faces that actually clamp down?

22 A It's approximately one square inch.

23 Q So that in effect places a 40-pound-per-square-
24 inch pressure on the fin. Is that correct?

25 A That's correct.

1 Q Is it your understanding that many of these
2 control rods may have required repeated clamping in order
3 to permit the thickness gauge, or the width gauge, to pass
4 over the fins?

5 A Yes.

6 Q Would you have any idea what the upper limit of
7 the times which a clamp must be applied on an oversized
8 fin to permit complete passage of that gauge?

9 A No, I don't.

10 Q Would you say that 10 is a number that could
11 possibly be --

12 A It's very possible.

13 Q 100?

14 A We have no limitation set as to how many would
15 be on there. If the number became very excessive, we
16 would probably question that and go see why we had so
17 many of them.

18 Q On those six rejected rods, was clamping -- I
19 understand those -- were there five that were oversized,
20 and one that was dented? Is that -- my recollection correct?

21 A I'd like to make sure which six we're talking
22 about.

23 Q There were six control rods which were sent
24 back to the manufacturer. And my understanding -- as I
25 understood the version this morning -- was that five of

1 those were oversized and could not be clamped down. Is
2 that correct?

3 MR. CONNER: Objection, your Honor. That is
4 totally mischaracterizing the testimony that was given. And
5 if Dr. Parkhauser didn't hear it, that's too bad, but he's
6 mischaracterizing the testimony.

7 BY DR. PARKHAUSER:

8 Q Could you tell me what was the matter with those
9 five?

10 CHAIRMAN RECHNEIDER: I was going to say
11 "objection sustained," but the question at least should be
12 rephrased, because it was mischaracterizing what the
13 witness said.

14 BY DR. PARKHAUSER:

15 Q Could you tell me what the nature of the
16 difficulties with the rejected control rods were?

17 A (Witness pause) There were three that did not
18 meet the straightness requirement.

19 Q What requirement?

20 A The straightness requirement. "Straightness."
21 Another terminology for that might be "bulk," if you're
22 looking for a different term.

23 There was one that did not meet the thickness
24 requirement. There was one that had a large at the
25 seal. And one that had a gouged, torn sheath.

1 Q Now this straightness or bowing of that is
2 different than waviness? Is that correct?

3 A Yes, it is.

4 Q And on that one that was -- that had some
5 difficulties with its thickness, would you happen to know
6 what the dimensions of that rejected rod were?

7 MR. CONNER: Objection, your Honor. That would
8 be irrelevant; it's been rejected. If this is something
9 that they wanted to get into, they should have asked it on
10 discovery.

11 (Board conferring.)

12 DR. FANKHAUSER: Mr. Chairman, what I'm --

13 (Board conferring.)

14 CHAIRMAN BECHTOLD: Dr. Fankhauser, what is
15 the relevance?

16 DR. FANKHAUSER: What I'm trying to establish is
17 exactly -- I have had great difficulty in determining exactly
18 where the cutoff point is beyond which you reject a control
19 rod. Because it seems like there are a number of rods that
20 were oversized but were dumped and accepted.

21 I'm trying to determine, on this one rod that
22 was rejected due to overtickness, what those dimensions
23 were so we will at least know the upper limit beyond which
24 none of these rods exceeded.

25

1 CHAIRMAN BECHHOEFER: With or without the clamp?

2 DR. FANKHAUSER: I would have to get into that
3 question -- obviously it would be with the clamp, but it
4 would be instructive I think for us to see the maximum
5 dimensions, and what those dimensions go down to.

6 MR. CONNER: If the Board please, we would save
7 some time -- apparently Dr. Fankhauser didn't hear the
8 witness' answer, the one that did not pass the .280 guage.
9 It was something that was obviously rejected out of hand.
10 That's what the testimony said.

11 DR. FANKHAUSER: If I'm not mistaken, that's the
12 one that was gouged. There's a difference.

13 MR. CONNER: That one that was gouged was
14 the sixth one, on the sheath, not on the wing.

15 MR. BRENNER: Mr. Chairman, I don't understand
16 that last comment.

17 CHAIRMAN BECHHOEFER: I think the witness could
18 speak to the matter of which one is rejected on which ground.
19 There seems to be some confusion here. I think we
20 should get it clarified.

21 WITNESS PENCE: I didn't hear that.

22 CHAIRMAN BECHHOEFER: Clarifying which ones were
23 rejected on which grounds, and particularly the --

24 WITNESS PENCE: Okay, I'll go through those again.

25 CHAIRMAN BECHHOEFER: The one you said on

1 thickness, if you know how thick it was, or a thickness
2 beyond which you would not accept one. You may not know
3 that it was a lot thicker than that, but if you know the
4 maximum that you take.

5 MR. BRENNER: Mr. Chairman -- excuse me,
6 Mr. Witness -- are you asking him to go through the story
7 on the six rejected rods again?

8 CHAIRMAN BECHHOEFER: Yes.

9 MR. BRENNER: Could I make a suggestion that will
10 help me, before I get up. Could he give the rod numbers,
11 also?

12 WITNESS PENCE: Yes.

13 CHAIRMAN BECHHOEFER: If he has them in front of
14 him.

15 MR. BRENNER: He should. The records have them.

16 WITNESS PENCE: Number A-484 was rejected because
17 of the .280 thickness. The nature on thickness on that was
18 .307, maximum. One of the points here is not the fact that
19 that is some maximum dimension; it's the fact that that
20 area is no longer flexible. And with a 40-pound force, you
21 cannot push it back into the .280 limit. It's not the fact
22 that you have something that would be greater than even the
23 3.07 -- I mean, .307, if that were out in the middle of the
24 rod where the sheath is still flexible, that would still be
25 an acceptable dimension. So that there is no such outside

1 limit, as far as thickness goes.

2 Now this was one that was hit on the edge, and
3 that's why there was a dent there.

4 Now numbers A-461, A-480, A-443, were rejected
5 because of straightness.

6 CHAIRMAN BECHHOEFER: Did you say --- Excuse me.
7 Did you say "thickness," again?

8 WITNESS PENCE: "Straightness."

9 CHAIRMAN BECHHOEFER: Straightness? Oh, I'm sorry.

10 DR. HOOPER: You mean, bow? Using your --

11 WITNESS PENCE: Bow, yes.

12 DR. HOOPER: Bow. Okay, I have bow.

13 WITNESS PENCE: Number A-437 had a damaged seal.
14 A-435 had a damaged sheath. On the surface, it had been
15 gouged.

16 DR. FANKHAUSER: In the event that your
17 explanation is correct ---

18 CHAIRMAN BECHHOEFER: I think that remark is out
19 of order.

20 DR. FANKHAUSER: Pardon?

21 BY DR. FANKHAUSER:

22 Q All right. Let's assume that your explanation
23 is correct, that the reason that there was only one control
24 rod which was rejected for being too thick, and that was
25 because the sheathing could not be clamped down, then I would

1 wonder why it would not be appropriate to test all rods
2 under pressure? In other words, the only thing you're
3 concerned about is the thickness of the fin under pressure.
4 I would think that that would be the way to check it.

5 Is that an inappropriate assumption?

6 A (Witness Pence) Well, if there was a very
7 simple way to do that, it might be appropriate.

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1 Q How much pressure did you estimate is applied
2 to the fin of the control rod when it is inserted into
3 the reactor?

4 A That can vary quite a bit. The limit that
5 we have for operational purposes, this is not a safety
6 requirement, this is an operational requirement, that
7 the maximum vertical friction be approximately 150 pounds.
8 This is the point at which a control rod will not settle
9 into a notch.

10 Q Friction, if I remember my physics correctly,
11 has to be expressed in terms of footpounds; is that not
12 correct?

13 A That's in error.

14 Q You can express friction in pounds alone?

15 A Right.

16 Q That is news to me.

17 In the event that a rod had to be repeatedly
18 clamped in order to pass the thickness gauge, say
19 repeatedly clamped 100 times, would you agree that the
20 total amount of pressure needed to be applied to that
21 rod to get it in conformance would be about 4000 pounds?

22 A That is hypothetically correct.

23 Q Do you think that 4000 pounds pressure on
24 the side of the fin could be translated into 150 pounds
25 friction force?

1 A Yes, it could.

2 Q When you say substantial, on page 2, halfway
3 down the page, control rod is designed to operate with
4 substantial rubbing friction, what does substantial mean?

5 A That means that it is designed for rubbing
6 condition. This will be something less than the 150
7 pounds. Now that will, of course, vary depending a little
8 bit on how straight the control rod is and what the
9 actual gap between the fuel is.

10 Q And that 150 pounds is the amount of force
11 that the control rod drive exerts?

12 A No.

13 Q How much force does the control rod drive
14 exert?

15 A This varies a little bit between conditions,
16 but the sort of the bottom line area is an approximate
17 2000 pounds. This can go up to as much as 6000 pounds.

18 Q Is that same amount of force applied when
19 the rod is inserted as when it's drawn out?

20 A No. In drawing the control rod out, you either
21 allow it to come out by gravity or you put approximately
22 250 pounds force over the top -- I'm sorry, 250 pounds
23 of pressure, that would convert to approximately 500
24 pounds force to drive it out.

25 Q In the sentence that follows, it says,

1 "Therefore, the 40-pound inspection clamp
2 has no effect on safety of normal operations."

3 Would you say that in order to make that
4 statement, one would have to assume that you only applied
5 the 40-pound clamp once?

6 A No.

7 Q You are saying it could be applied repeatedly
8 over the entire length of the rod?

9 A Correct.

10 Q The entire length of the rod is about 10 or 12
11 feet?

12 A 12 feet.

13 Q And what is the width of the clamp?

14 A Excuse me, I don't understand what you mean
15 by width.

16 Q The clamping faces clamp onto the control
17 rod.

18 A Right.

19 Q What is the width of the clamp? I
20 want to know how many times one would theoretically --
21 the maximum number of times one would theoretically have
22 to clamp on that fin in order to pass a thickness gauge
23 over the entire length.

24 A That depends. That is controlled by the
25 40-pound spring on the clamp, as to how far the clamp

1 closes.

2 Q I don't think you understand.

3 A I don't think I do either.

4 Q You have a fin that's 10 feet long, you
5 have a clamp at one end, because you can't meet the
6 thickness gauge, you have to repeatedly take off that
7 clamp and put it back on to get that gauge to move along
8 the control rod. I'm looking for the ceiling limit
9 for the maximum number of times that clamp might have
10 had to have been applied.

11 MR. CONNER: Objection, your Honor. We have
12 an open-ended hypothetical question, I don't know where
13 we got a 10-foot long --

14 DR. FANKHAUSER: It's appropriate because
15 he can't recall the number of times a clamp may be used.
16 I'm looking for the limit.

17 WITNESS PENCE: I thought I told you a little
18 while ago there is no limit. There is no maximum limit
19 defined for the number of times you can use the clamp.

20 Now, of course, when somebody uses the clamp
21 an excessive number of times, the inspector may get a
22 little bit curious and ask a couple of questions, but
23 there is no engineering final limit as to how many times
24 you can apply that.

25 Now, if for some reason, somebody did apply
it -- I'll take a hypothetical case -- many, many, many

1 times, so there is a very large friction that will
2 obviously be found during the pre-op testing of the
3 control rod and the control rod drive.

4 BY DR. FANKHAUSER:

5 Q That clamp is about a quarter of an inch wide;
6 is that correct?

7 A (Witness Pence) The clamp -- it depends on
8 the spring, the 40-pound force spring, as to how far the
9 clamp is open or closed.

10 Q I'm not asking the distance between -- the
11 distance between the faces, I'm asking the surface area
12 of the clamp and faces.

13 A I said one quarter inch -- I'm sorry, one
14 square inch.

15 Q One square inch is not a--

16 A I don't understand what you mean by the width.
17 It is approximately just a little bit less than a one
18 inch diameter face. Is that what you are asking?

19 Q You told me that the face has an area of one
20 square inch.

21 A That's correct.

22 Q If that clamp were four inches long, it would
23 have a width of one quarter of an inch if it were one
24 inch, the face was one inch long, it would have a one inch
25 wide face? I don't see --

1 A It's slightly less than one inch in diameter.
2 It's round, it's not square.

3 Q Thank you.

4 So that the maximum number -- assuming the
5 worst case, the maximum number of times that one
6 might have to reapply that clamp if one had to work one's
7 way all along the fin, and if I'm not mistaken, that
8 rod would still pass inspection because we're able to move
9 that, that would roughly be 12 times -- 12 inches times
10 10 feet; correct?

11 A That's a hypothetical correct statement.

12 Q What kind of effects might you expect in the
13 event that sufficient friction were generated between
14 the control rod when withdrawn, and the reactor assemblies
15 themselves, fuel assemblies themselves, such that the
16 rod would not go into the core? What kind of effects
17 would you expect on the reactor itself? Under that
18 situation?

19 MR. CONNER: Objection.

20 WITNESS PENCE: I don't understand --

21 DR. FANKHAUSER: I don't understand what
22 sufficient means myself.

23 MR. CONNER: The question is unintelligible
24 and we object to it on that basis.

25 DR. FANKHAUSER: I'm surprised Mr. Conner
 can't understand my question, but I would point out that

1 the reason presumably we are worried about these control
2 rods is that they will not function properly at times
3 when it would be important for them to function.

4 What I'm trying to determine at this point
5 is exactly what kind of effects one might see in the
6 event that the control rod refused to be inserted into
7 the reactor.

8 CHAIRMAN BECHHOEFER: I still don't understand
9 your previous question; however, I see what you are
10 driving at, but I still couldn't understand the
11 previous question. I think you'd better rephrase it.

12 DR. FANKHAUSER: All right.

13 CHAIRMAN BECHHOEFER: Try to clarify it; maybe
14 shorten it a little bit.

15 BY DR. FANKHAUSER:

16 Q The reactor is in operation, all of the fuel
17 rods, all of the control rods are to be driven
18 into the reactor; one of them refuses to go in, because
19 the friction is too great, and it will not allow itself
20 to be inserted into the reactor. What kind of effect
21 could one expect on the reactor performance from such a
22 noncooperative control rod?

23 A There would be nothing that would happen. All
24 the analysis assumes that the control rod with the
25 highest worth or the one that is most important to the

1 activity to be controlled, will not function. That is
2 assumed in all calculations.

3 Also, in a random, checkerboard type pattern,
4 we only need 69 percent of the rods to go in. In a
5 cluster we can have four control rods next to each other
6 that will not insert, and still be within safety criteria.

7 Q Does that safety criteria assume overheating
8 of the reactor such as in an "abnormal occurrence" where
9 expects expansion of the channel through which it would
10 travel?

11 MR. CONNER: Objection, your Honor. There is
12 nothing in the record that lays the foundation for that.
13 Dr. Fankhauser has waved a magic wand and all of a sudden
14 has expansion of channels.

15 The witness has just said what the shutdown
16 criteria area, that is what must be met. Now running
17 around a hypothetical question about expansion or
18 something on a hypothetical basis is certainly not
19 productive here, and is certainly a long way from this
20 contention.

21 DR. FANKHAUSER: The last time I took physics,
22 I seem to remember that when metal is heated, it expands,
23 and when one has a channel through which a control rod
24 must pass, and if that control rod is already oversized,
25 and one is having trouble with the reactor already such

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1 that it's overheated, one would expect the channel through
2 which the control rod passes to expand, and would
3 further inhibit the movement of that rod, and I wonder
4 whether those criteria that you cited include accident
5 or semi-accident conditions.

6 CHARMAN BECHHOEFER: I think the objection was
7 you didn't have enough foundation for your question. I
8 think that objection is well taken, but you could lay
9 some foundation.

10 MR. CONNER: We also object, your Honor, to
11 Dr. Fankhauser's testifying on some hypothetical physics
12 which has nothing to do with this contention. This
13 contention has to do with the manufacture of control
14 rods.

15 Now we have seen well-meaning amateurs
16 explore the world of nuclear physics and engineering
17 in cases before. This is what Dr. Fankhauser apparently
18 wants to do, is to study the reactivity and the worth
19 of control rods and so forth, and we object to this
20 as being completely outside this contention, and he
21 should not be allowed to do it.

22 MR. BRENNER: Mr. Chairman, if I might, I
23 can't resist saying that was the nicest thing I ever
24 heard Mr. Conner say about Dr. Fankhauser in calling
25 him well-meaning.

1 MR. CONNER: I'll withdraw the comment.

2 (Laughter.)

3 MR. BRENNER: On a more serious note, I think
4 what we have just heard from Dr. Fankhauser does
5 illustrate the problem in having non-attorneys cross-
6 examine. We end up with a cross-examiner testifying
7 instead of asking questions, and perhaps Dr. Fankhauser
8 didn't realize it, but he went on for quite some time
9 without asking a question, and that's not proper, and if
10 he doesn't concentrate on asking questions which he
11 was doing very well at for a while, I might add, I think
12 the Board should step in.

13 CHAIRMAN BECHHOEFER: I think for the immediate
14 question, Mr. Conner's objection is sustained, but I
15 think you will have to lay more foundation, and do it by
16 asking questions. You can't testify.

17 MR. FANKHAUSER: I had been asked what I
18 meant by the question, and I admit that perhaps I gave
19 too many of the answers myself. Let me ask this:

20 BY DR. FANKHAUSER:

21 Q In the event that it becomes necessary to
22 shut down a reactor because it's overheated, what effect
23 would you expect that overheating to have on the control
24 channels through which the control rods pass in terms
25 of their dimensions?

1 A Well, it would have very little effect,
2 because although the fuel is expanding, the base on
3 which the fuel sits is also expanding, which moves the
4 fuel bundles further away, and enlarges the gap, so
5 they compensate each other.

6 Q So that the dimensions of the control rod
7 channels would be unchanged in an overheated reactor?

8 A I don't understand what area of terminology
9 you are referring to here --

10 CHAIRMAN BECHHOEFER: I think that mis-
11 characterizes what the witness just said.

12 DR. FANKHAUSER: My understanding of his
13 answer was he said that there would be counteracting
14 forces on that channel.

15 WITNESS PENCE: No, I said there would be
16 counteracting movements of these two bundles. In
17 other words, as the fuel bundles expand, as they get
18 larger, the control rod, the fuel support which the
19 fuel bundle sits on, also expands and moves the fuel
20 bundles further apart.

21 MR. BRENNER: Mr. Chairman, I'm sorry to have
22 to do it again, but I really don't think counsel should
23 be engaging in conversation with his own witness while
24 he's being cross-examined.

25 MR. CONNER: Well, I don't agree with Mr.

1 Brenner, I was telling the witness not to volunteer
2 information, to not try to win an argument with Dr.
3 Fankhauser.

4 MR. BRENNER: I'm not criticizing the quality
5 of the advice, which I think is good, and I tell my own
6 witnesses that.

7 The point is you're not supposed to be coaching
8 the witnesses, just that kind of thing, while he is
9 being questioned.

10 MR. CONNER: Mr. Brenner is out of line. He's
11 used that phrase twice today without having any idea
12 what he's talking about. I told him what I told the
13 witness and there's nothing wrong with that. Mr.
14 Brenner's paranoia on these things is getting a little
15 out of hand.

16 MR. BRENNER: We may be fooling around with
17 paranoia, and I neglected to put it aside, although
18 I've got a couple of bad lines handed to me on that
19 subject, such as, "Help, the paranoids are after me."

20 But I used the term coaching advisedly.
21 First of all, it's a term we all recognize.

22 Second, Mr. Conner identified Mr. Pence as his
23 quarterback. I don't know of any football rules that
24 allow the coach in the huddle, and that's what is going
25 on here.

1 Mr. Chairman, I would like to get the
2 direction I requested from the Board to Mr. Conner.

3 MR. CONNER: I can assure Mr. Brenner I
4 will not coach the witness.

5 CHAIRMAN BECHHOEFER: I think we mentioned
6 earlier that counsel should not be coaching their
7 witnesses on cross-examination. I don't know whether
8 Mr. Conner was doing that or not. I wasn't really
9 watching. But I will assume that counsel will not coach
10 their witnesses.

11 BY DR. FANKHAUSER:

12 Q Spot welds that were made on control rods
13 apparently produced a certain amount of debris; correct?

14 A (Witness Pence) Yes, it's normally referred
15 to as spot weld splash and spatter.

16 Q Does the dimensions of the spot weld splash
17 and spatter vary over a wide range?

18 A Well, it goes from a pretty small to almost
19 like a dust condition.

20 Q But one seldom sees any spatter any larger
21 than what you displayed?

22 A Yes, it's very rare. It happened to be an
23 extremely out-of-control situation.

24 Q In the event that some of this spatter got
25 into the reactor coolant water, you stated it would be

1 removed by filters?

2 A Correct.

3 Q Where are these filters located?

4 A They are all over the place. They are in --
5 almost every kind of component has some kind of a filter
6 in it. Also there is a very large clean-up system
7 that is used for the reactor water.

8 Q You say, if I understand it correctly, some
9 of these filters are in front of pumps that circulate
10 water through the reactor?

11 A Correct.

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Q So these filters would obviously have to pass large quantities of water through -- per minute, correct?

A No, not necessarily. It all depends on which pump you're talking about.

Q Let's talk about a recirculating pump. What would be the gallons per minute flow in a recirculating pump?

A That I do not know. I do know that it is very large.

Q Do you know if there are filters in front of that -- these pumps?

A No, I do not know.

Q I'm personally very surprised to hear the suggestion that there might be.

So if there were no filters, that debris might well pass through the recirculating pump?

A Particles of that small a size would not affect pumps that have that large a flow at all.

Q There are some pumps and some components which would be exposed directly to such particles if they were suspended in the cooling water; is that correct?

MR. COMBER: Your Honor, we object to this line. I mean, the contention is on a totally different area. It says that the control rods were not manufactured to meet size specifications. It has absolutely nothing to

david2 1 do with the reactor cleanup system or the functioning of
2 pumps.

3 (Board conferring.)

4 CHAIRMAN BECHHOEFER: I think that question is
5 getting a little far.

6 Objection sustained.

7 DR. FANKHAUSER: If I may address the board on that
8 question, I think it is important for us to explore why
9 we would be concerned about oversized control rods -- about
10 debris within the control rods, and it may well be that
11 we will find that there is nothing to be concerned about,
12 in which case we can move ahead.

13 But I think we have not yet established that
14 particles of this size or any size can be ignored in -- in
15 safe operation of a reactor.

16 MR. CONNER: Your Honor, we object to counsel --
17 I mean, intervenors continuing to argue with board on a point
18 after the objection has been sustained. It is not productive,
19 and it does not speed up the taking of evidence.

20 (Board conferring.)

21 MR. BRENNER: Mr. Chairman --

22 (Board conferring.).

23 DR. SOOPER: Mr. Fankhauser, I think the objection
24 here is if you have something you want to ask regarding
25 the filtration of these particles which is specific, which

1 is specific -- he said at one point they were filtered
2 out.

3 Now, if you have some other -- if you want to
4 go somewhere else with this thing, you should be specific
5 and say -- ask him something specific as to the filtration
6 of these particles.

7 Now, I don't know where you're going now. The
8 board is not prepared to say, and it doesn't seem to be
9 relevant.

10 DR. FANKHAUSER: Well --

11 CHAIRMAN BECHHOEFER: The --

12 DR. FANKHAUSER: Well, I was addressing myself
13 to some testimony that was presented earlier, that to the
14 effect these particles were filtered out before they
15 reached critical components.

16 CHAIRMAN BECHHOEFER: Yes.

17 DR. FANKHAUSER: And if I'm not mistaken, I've
18 just established they were not filtered out before they
19 reached the recirculating pumps.

20 CHAIRMAN BECHHOEFER: Certainly the board did
21 not hear the testimony that way. Maybe it could be
22 restated.

23 We did not understand you to say that it worked
24 or didn't work.

25 WITNESS FANCE: I think my answer to the question

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was I didn't know whether there were filters in the
recirc system.

BY DR. FANKHAUSER:

Q So that when you earlier said that these filters --
these particles would be filtered out before they reached
the pumps, you forgot that you didn't know whether there
were some in front of these pumps.

MR. CONNER: We object to that, your Honor.
the witness testified that there were filters all over
the place.

The witness is not offered as an expert on the
reactor cleanup system. He's an expert on the manufacture
of the control rods, and we object further to this line
of questioning whereby Dr. Fankhauser will next be taking
us out to the switch yard to see what will happen out
there.

And that is simply not the way the Commission
rules are established to limit matters to contentions.

MR. BRENNER: Mr. Chairman --

(Board conferring.)

MR. BRENNER: Mr. Chairman, if I might, on behalf
of the staff I think we have gotten very far afield and
beyond the contention. I'd like to remind the board how
we got to this point: we started out with contention 13.
from the staff's point of view, very late in the game.

david5 1 annely, today we learned that these particles are now part
2 of contention 15 or at least within the realm of something
3 the board wants to hear.

4 I would submit, I think without great argument,
5 that even if I were to concede that part of the
6 contention -- which I don't believe -- but conceding that,
7 arguendo, it's clear they're somewhat on the periphery, at
8 best.

9 From that point we allow the parties who had
10 contention 15, of which Dr. Fankhauser is not one, to
11 question on that.

12 Now, we have Dr. Fankhauser, who is not a party
13 to contention 15, under Prairie Island, be allowed to
14 ask questions on a contention. I assume that also means
15 the very peripheries of the contention, which would be the
16 particles.

17 But for heaven's sake, it shouldn't include the
18 reactor cleanup system just because we're talking about
19 particles.

20 CHAIRMAN BECHHOEFER: The board was just about
21 to hold that.

22 MR. BRENNER: But I think it's useful to see
23 how slowly but sure we walked down that line.

24 CHAIRMAN BECHHOEFER: The witness testified that
25 the filtration -- there was filtration which protected

david6 1 the pumps that needed protection. And I think the question
2 started to get into pumps that the witness said were so
3 big that the particles couldn't affect them at all, even
4 if they weren't filtered.

5 I think we're getting a little far afield. We'll
6 try to go on from that, and I think we should cut back a little
7 bit.

8 I just don't think the last series of questions
9 is relevant to the -- either the contention or the expanded
10 contention, as you will. I think it's going a little bit
11 far afield now.

12 So, the last objection is sustained.

13 BY DR. FANKHAUSER:

14 Q All right, let's address ourselves to those fuel
15 rods -- those control rods which went through the cleaning
16 process.

17 That -- that cleaning process included rapping
18 with a mallet, was it? WRapping in cloth, wrapping in grey
19 tape?

20 A (Witness Pence) No, that was some rags that were
21 wrapped in grey tape.

22 Q Right.

23 A No mallet involved at all.

24 Q Did you observe any changes in specifications of
25 the control rods after that treatment?

david7 1 A (Witness Kananen) No.

2 Q What?

3 A No.

4 Q Were all rods -- control rods checked after that
5 treatment?

6 A (Witness Pence) I think that was answered before.

7 MR. CONNER: Your Honor --

8 (Board conferring.)

9 CHAIRMAN BECHHOEFER: That was asked before,
10 Dr. Fankhauser.

11 I'll sustain that one.

12 BY DR. FANKHAUSER:

13 Q My understanding was that spot checks were made;
14 is that -- is my understanding correct on that?

15 A (Witness Pence) That's correct.

16 Q May I then accurately conclude that some rods
were not checked after rapping?

17 A I think that's correct.

18 Q So, would you say that changes in dimensions might
19 have occurred as a result of rapping?

20 A When you say "might," that's true.

21 DR. FANKHAUSER: No further questions.

22 CHAIRMAN BECHHOEFER: Mr. Heile.

23 MR. HEILE: Thank you.

24 BY MR. HEILE:

25 Q With reference to the .280 inch thickness of the

david8 1 control rod, is that a specification that General
2 Electric had to comply with, from the company to General
3 Electric in ordering these control rods?

4 A No.

5 Q So it really isn't related to a particular
6 specification in the contract.

7 Where do we get the setting of the figure .280
8 of an inch?

9 A That is an engineering requirement that is on the
10 drawing that gives us the performance under which we did
11 our test work.

12 Q These are not shop drawings, are they, what
13 you characterize as a shop drawing in the contract?

14 A Yes, our engineering drawings are our shop
15 drawings.

16 Q The drawings do not make up part of the
17 agreement, though, between Cincinnati Gas and Electric
18 or the applicant's, well say, and General Electric.

19 A No.

20 Q Now, when you put a clamp on the blade in an
21 area where it exceeds -- let's assume we're taking a
22 control rod that at a certain point exceeds .280 of an inch
23 thickness; you put a clamp on that, and that reduces the
24 size back down to the gauge of .280; is that correct?

25 Though presumably it has the capacity to reduce

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1 that size back to the .280 of an inch.

2 A As long as it doesn't take more than 40 pounds
3 to get to that point, right.

4 Q Then you take the clamp off and presumably when
5 the control rod actually enters the reactor at some point
6 later when it's put into service, there is no clamp on it;
7 is that correct?

8 A Correct.

9 Q So is it true that after the clamps are renewed,
10 that in some instances the gauge could get back above the
11 .280 of an inch?

12 A It does it all the time.

13 Q It does -- I'm sorry?

14 A It does it all the time; the clamp does not
15 permanently deform the blade in any way.

16 Q The only way -- the purpose of the clamp, then,
17 is to determine if in fact the material can be compressed
18 below the .280 of an inch gauge.

19 A That is correct. We're trying to find out if it
20 might be something underneath there or there's a real
21 mechanical damage that 40 pounds cannot compress the sheath
22 to remove the normal waviness condition.

23 Q But is it also correct, then, that once the --
24 once the -- presumably it goes back into the same position
25 it was before the clamp was inserted on the rod -- on the

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1 blade.

2 Once the rod goes into the reactor, then you may
3 have a condition where you have a variance of gauge or
4 thicknesses on that blade.

5 A That's correct.

6 Q And to the extent that you have a variance of
7 thickness on the blade where the variance exceeds the .280
8 of an inch, you will have increased friction; is that
9 correct?

10 A That's very probable.

11 Q Now, where you have increased friction, can
12 I assume you have increased wear?

13 A That's correct.

14 Q If you have increased wear, then the control rod
15 at some point would be insufficient to function properly;
16 is that right? It would be at the point of increased wear?

17 A No. Tests have shown that this wearing is very,
18 very small over the lifetime of a control rod.

19 Q Is it correct, though, that it would tend to
20 wear that particular spot where the gauge is thicker, down
21 more so than spots where the friction is less?

22 A That's correct.

23 Q Now, why did we pick the .280 of an inch thickness
24 on the end of these blades?

25 A That was a rather arbitrary point picked by

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1 engineering because it was supported by testing.

2 Q What would happen, may I ask you, if they had
3 selected, for instance, instead of .230, 400.

4 Obviously -- may I inquire, would then the
5 blade not function properly on the control rod?

6 A Well, it might; we would have had to have made
7 the rod different; the spacing between the fuel may have
8 had to have been different.

9 And we may have had to have put much more
10 stringent requirements on the control rod.

11 Q You would have had to expanded the space in
12 between the fuel?

13 A That's a possibility.

14 Q To accommodate the different gauge?

15 A That's correct.

16 Q On the blade. So there is a point -- considering
17 you keep the fuel in the same position it is now -- the
18 distances between -- there is a point at which the gauge
19 is unacceptably thick.

20 A Well, I don't know. We've never been able to
21 find that point; we were able to reduce the space between
22 the fuel to a dimension of .16 and still meet scram requirement
23 and that is with a control blade thickness of .23.

24 Q Well, I guess what I'm getting at is: there has
25 to be a point where the blade is simply not going to fit a

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1 certain thickness; the blade is not going to fit without
2 adjusting the other elements inside.

3 A That's correct.

4 Q And we don't know what that -- what that thickness
5 would be.

6 A No, we tested that to a point and then finally
7 gave up. We couldn't stop the control rod.

8 Q So we just -- the main reason, I assume, for the
9 280 gauge is to reduce friction to the maximum extent possible.

10 A No, it is based on operational characteristics
11 and not safety.

12 We are trying to minimize the friction so that
13 the control rod will last longer and will not have operational
14 problems.

15 In other words, this 150 pounds of frictional
16 force that we're trying to stay below affects normal
17 jogging and power shaping during normal operation of the
18 station.

19 Q What would be the probable result of that kind
20 of jogging and power shaking operation that you're trying
21 to avoid by reason of limiting the amount of friction?

22 A I don't think I quite understood the question.

23 Q I believe what you said was the reason you
24 wanted to keep the friction to a minimum was to avoid what
25 you call operational problems, which might include jogging
26 or shaking.

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1 A After you get -- after we get to approximately
2 150 pounds of friction, the control rod drive mechanism will
3 no longer settle into a latched position.

4 In other words, after each motion of the
5 control rod after the power changes, you have to get into a
6 notched position so the control rod is locked in that
7 position.

8 Q What is wrong -- go ahead.

9 A This is done by reducing friction; in other
10 words, if you now have enough friction, it will overcome
11 alteration of moving parts. The control rod -- you cannot
12 have it settled into this notched position. This is an
13 operational characteristic.

14 Q Well, assuming then for the sake of argument
15 you're trying to avoid that operational characteristic
16 of not settling properly in that position, what is the
17 likely result of that failure of that rod to settle properly
18 in that position?

19 Why are you trying to avoid that?

20 A I don't understand your "likely."

21 Q Well, I assume that what you're trying to do
22 is avoid the failure of the rod to settle properly in an
23 operational position by too much friction. Is that your
24 testimony?

25 A That's correct.

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1 Q You're trying to avoid a certain situation that
2 you described to me.

3 My question to you is: why are you trying to
4 avoid that situation?

5 A Because it's liable to continue to drift in
6 and you would destroy the proper power shaping, and you'd
7 have a tendency to shut down your reactor.

8 Q So what you're saying is that too much friction
9 under the circumstances that we've been discussing for the
10 last five minutes could possibly result in a malfunction
11 of the control rods themselves.

12 A Well, it's not a matter of malfunction. The rod --
13 I mean, the control rod drive cannot lock in its proper
14 position and the control rod will -- will go on into the
15 core and shut that area down.

16 Q As opposed to, I assume, having complete control
17 over how much area you wanted to shut down; you may not
18 want to shut it down completely.

19 And by reason of this problem it would have a
20 tendency to shut it down entirely.

21 A Well, no; you -- you have to get into a little
22 bit of nuclear physics about how you try to power shape a
23 nuclear core to make an efficient operation.

24 Q Well, I don't know --

25 A If you have a localized area that is just shut

david15 1 down, it's -- you're not operating your reactor
2 efficiently. You have part of it shut off.

3 Q I wouldn't want to get too much further into that
4 discussion. But I may assume it is your testimony that
5 the friction that may be developed by excessive thickness of
6 the size of the control rod is not something which under
7 any circumstances could contribute to a failure of the
8 control rods to adequately shutdown the reactor.

9 A That is right.

10 Q Under no circumstances?

11 A That's correct.

12 MR. HEILE: All right, fine. Thank you. That's
13 all.

14 CHAIRMAN BECHHOEFER: At this stage, I think
15 we'll take a break.

16 MR. BRENNER: I'm sorry, Mr. Bechhoefer, I only
17 heard the break part.

18 CHAIRMAN BECHHOEFER: Our questions come up next,
19 and --

20 MR. BRENNER: Our questions come up next.

21 CHAIRMAN BECHHOEFER: Oh, that's right. I
22 think we'll take a break anyway.

23 MR. BRENNER: Okay.

24 (Brief recess.)

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1 CHAIRMAN BECHTOLD: Are we ready to proceed?

2 BY MR. BRENNER:

3 Q Mr. Pence, what is the nominal spacing between
4 fuel assemblies?

5 A (Witness Pence) I'd have to doublecheck that
6 number. I think it's .46.

7 (Pause.)

8 The nominal dimension is .562.

9 Q Okay, and what's the nominal -- now this is the
10 space between which a blade of a control rod fits. Is that
11 correct?

12 A That's correct.

13 Q And what's the nominal width of that blade?

14 A It has one area -- the thickness is .28, and
15 there is one additional envelope requirement that is the
16 result of straightness that is .32.

17 Q And these of course are the numbers by which
18 you derive the gauges for the initial acceptance criteria
19 inspection; is that correct?

20 A That's correct.

21 Q Of the control rods that were accepted for
22 Zimmer, what's the widest high spot, or bulge? What's the
23 dimension of that?

24 A I'm not sure I know that number. I'm assuming
25 you mean the width with, or without clamping?

1 Q Without clamping.

2 A Okay, before clamping I have on here that it's
3 .296.

4 Q And that is the highest?

5 A I don't think I can really say that, because I
6 don't know if some of the other high spots that may have
7 been extremely flexible may have passed during the initial
8 inspection where a clamp was put next to that spot, and
9 then that high spot was removed. I don't know what those
10 high spots really were. We didn't take actual measurements
11 if the clamping removed it and the gauge fit right back over
12 it, or if the micrometer was below .280.

13 Q Let me see if I understand that. You're saying
14 that there were some that may have been inspected only with
15 the clamp on? Is that correct?

16 A Well, you run the gauge by, and if you have a
17 high spot that's indicated by the gauge, then the first
18 approach is to put the clamp next to the high spot, okay?
19 Now the high spot is then either measured by the gauge or
20 the micrometer, and in most cases that high spot is not
21 measured by the micrometer before you put the gauge -- I
22 mean the clamp on next to it. So you really wouldn't
23 know what the actual dimension was before that clamp was put
24 on.

25 Q All right, of the one rod that was rejected for

1 failing solely to meet the .280 guage criteria, you
2 testified that the high spot for that was about .307. Is
3 that correct?

4 A That's correct.

5 Q You stated at that point they were above -- it
6 had lost its flexibility. Is that correct?

7 A That's right, because it was right out on the
8 edge of the wing, and there was a dent on the outside, so
9 that it made a very rigid spot right there.

10 Q Is it possible that any of the rods accepted had
11 a high spot greater than about .33?

12 A (Witness Kennan) No, no.

13 Q How do you know that?

14 A The 320 guage passed over all of the rods that
15 we accepted.

16 Q Well, back to Mr. Pence.

17 The problem is that, Mr. Pence, you told me that
18 you didn't measure all of them. You might have had some
19 that were flexible, and therefore you couldn't tell me that
20 the .296 was the high spot. Correct?

21 A (Witness Pence) This number that I used, .296,
22 is one that would not -- the high spot would not be removed
23 by the initial clamping technique, and that was written up
24 on the FDR. That's the only reason I have that number
25 available, because it was measured.

1 Q I understand. What I'm trying to find out is,
2 in the absence of direct measurements, is it possible for
3 you to bound what the high spot might have been for these
4 rods that were accepted, in the absence of clamping? The
5 number I suggested for the bound was .33.

6 A I guess you could say that because of the
7 straightness requirements; the other straightness gauge
8 has an envelope requirement of .32, and all of the parts
9 passed that criteria, and if they did not we sent them back.

10 Q Thank you.

11 We talked about the nominal thickness of the
12 blade being .200. Is there any part of that blade designed
13 to be thicker than that in a fuel assembly channel that
14 would protrude into the fuel assembly channel?

15 A Well, the roller areas are larger than that.

16 Q All right, where are the roller areas?

17 A The rollers are at the handle, which is at the
18 top.

19 Q What's the --

20 A And on the bottom of the velocity limiter.

21 Q Of the rollers -- are these called "upper guide
22 rollers"? Is that what we're referring to?

23 A I'm not -- I think those are the ones. That
24 terminology is a little bit foreign to me, but it's the
25 rollers at the top of the guide tube -- I mean the control

1 rod.

2 Q All right, what would the dimensions of the
3 rollers be?

4 A That's .40.

5 Please let me doublecheck that. I'm not really
6 sure whether that dimension is the roller at the top, or
7 whether that's the roller at the velocity limiter.

8 Q The one I'm asking about is the one at the top.
9 (Pause.)

10 A Maybe, for time's sake, I'll have somebody
11 doublecheck that for you, so I can make sure that that
12 ".40" is the correct diameter. I'm pretty sure it is, but
13 I'd rather check that than to make an error.

14 Q One moment, because I have some followup
15 questions depending on what the dimension is.

16 MR. CONNER: If the Board please, the staff of
17 all people should know. You know, this is in the
18 application and inspection reports, I suppose. Why can't
19 the staff simply give us a reference, and let's speed this
20 up.

21 MR. BRENNER: Wait a second, Mr. Chairman. This
22 is my cross-examination and he's the expert witness and
23 I'm asking him the questions. I'm not asking myself the
24 questions.

25 MR. CONNER: If the Board please, the staff

1 should have asked this on discovery, if they don't
2 have it, instead of now having to delay the thing and
3 having the witnesses running around looking for numbers.
4 It could have been asked a lot earlier. It is improper
5 and certainly something that should have been covered under
6 discovery. Mr. Brenner certainly knows better.

7 MR. BRENNER: First of all, the witness and I
8 were getting along fine up to this point.

9 Besides that, it is certainly proper cross-
10 examination, I think, to inquire into the dimensions of
11 the control rods. We've been talking -- that's what the
12 contention is all about, and the only way to get it on the
13 record, whether I know it or not, is by questions and
14 answers.

15 Now if Mr. Connor wants to let me stand up and
16 make a speech about the dimensions, I've got a lot of
17 numbers I can rattle off, but that's not the way the game
18 is played.

19 MR. CONNOR: You can make your speech sitting
20 down, as you just did.

21 CHAIRMAN BRECHENFEST: Objection overruled, if
22 there was an objection.

23 (Laughter.)

24 (Pause.)

1 BY MR. BRENNER:

2 Q Mr. Pence, is it possible that that dimension
3 is .333?

4 A (Witness Pence) I do not know for sure, but I
5 can check that out, but I don't know for sure.

6 Q Could you check it now, if I were to wait?

7 A I think so.

8 Q Okay, thank you. I'll wait.

9 (Witnesses conferring.)

10 (Discussion off the record.)

11 WITNESS AMICK: You are correct on that
12 dimension. It is .333 maximum.

13 BY MR. BRENNER:

14 Q Let me make sure I understand this, because it's
15 kind of surprising to go this late into the day and hear it
16 for the first time, but am I to understand that there's
17 actually a part of that control rod blade that is designed
18 to protrude, or designed to be wider in the gap between
19 fuel assemblies than the bulges in the control rod blade
20 unmodified by the pin?

21 A (Witness Pence) That's correct.

22 Q So even if those bulges, for the rods that were
23 accepted, were not flexible, even if you weren't relying
24 on pressure for them to slide in, there would be design
25 clearance between the fuel assemblies for them to pass?

1 Is that correct?

2 A That's correct, assuming that everything is
3 perfectly aligned.

4 Q All right, suppose -- to get to the question of
5 how you developed the .260 original acceptance criteria for
6 the gauge?

7 A That was a result of a lot of argument between
8 engineering and manufacturing as to what they could make
9 and what they couldn't make, but it was a rather arbitrary
10 point that was selected as a result of a significant amount
11 of testing.

12 Q It was never intended that a blade that exceeded
13 that would have to be rejected. Is that correct?

14 A That's correct.

15 Q Is this kind of an early-warning device such
16 that somebody's attention would be drawn to a rod that
17 didn't meet that specification for further checking?

18 A That's correct.

19 Q And that's what the further steps of the
20 procedures were designed to do?

21 A That's right.

22 Q How about the selection of 40-pound clamp? How
23 was the 40 pounds arrived at?

24 A That was a point at which the normal waviness
25 that's in the sheets could be removed without causing any

1 plastic or permanent deformation to the sheath itself, and
2 would not cause any damage to the absorber tubes underneath
3 the sheath. This was the actual number itself was rather
4 arbitrary a point. In other words, probably 35 pounds may
5 have been just as good a number, and 45 may have also been
6 just as good a number.

7 Q I wanted to be sure that it wasn't so strong
8 that it messed up the very rod you were testing. Is that
9 correct?

10 A That's correct. We did not want it to do any
11 permanent damage of any type.

12 Q And another parameter I suppose which
13 Dr. Fankhauser was asking about was, you would want to
14 make sure that the pressure in the clamp was not greater
15 than the pressure that would be encountered in the reactor,
16 assuming you needed the .300 as a specific tolerance. Is
17 that correct?

18 A That's correct.

19 In other words, we tried to minimize this number
20 so that it did not infringe on the operational margin that
21 we had.

22 Q And the operational pressure in the reactor
23 would be greater than 40 pounds? "Yes" or "no."

24 A Yes.

25 Q How do you arrive at that, in some questions

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1 and answers about the conversions of friction and pressure
2 and so forth?

3 A Well, if you make the assumption that you have
4 a worst friction condition -- in other words, where you
5 have a friction factor of one, in other words we have no
6 motion whatsoever, that means you would have a normal
7 force -- or a force the same way the clamp would be pushing,
8 of 150 pounds.

9 Of course in most cases, that friction factor
10 is somewhere between either approximately .3 to .7, so
11 it would have a value something higher than 150 pounds for
12 most cases.

13 Q Higher?

14 A Yes. In other words, it would take a force
15 between the control rod and the fuel bundle of a force
16 greater than 150 pounds to generate 150 pounds of vertical
17 friction.

18 Q In discussing the dimensions so far, that a
19 quick calculation -- if you'll bear with me, I took you
20 .562 between the fuel assemblies, and the nominal thickness
21 of the wing, .280, and arrived at .282. I hope I did that
22 correctly. I then divided that in half to arrive at what
23 I would call the gap between the blade and the fuel
24 assemblies. Would that be a correct procedure for me to
25 follow if I wanted that number?

A Yes.

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1 Q All right. By the process, I arrived at a
2 nominal gap of .141, to talk about what I would call
3 the standard condition, quote, unquote, at the blade.

4 Now if I wanted to arrive at the gap in terms
5 of calculating what I call the upper guide rollers
6 clearance, I would necessarily do the calculation of
7 subtracting .33 from .562 and dividing that in half; is
8 that correct?

9 A That's correct.

10 Q For the record, so I can find this in my
11 findings later, I believe that's approximately .1145.
12 At what minimum gap will the drive -- control rod drive
13 first show signs of operational difficulties?

14 Now we've defined gap the way we've been
15 using it in my foundation.

16 A I guess I also have to ask what kind of
17 operational difficulty are you referring to.

18 Q Well, I guess there is always a continuum.
19 The first kind of difficulty you might encounter, which
20 I suppose would be need to increase your hydraulic force
21 over the standard in order to insert the rod.

22 A I'm trying to see if I have that number
23 readily available.

24 (Pause.)

25 This change or I guess you would say it's a

1 point at which the normal condition starts to change at a
2 gap of approximately .285 inches. That's at the midspan
3 of the fuel channel.

4 Q I'm confused. Maybe we're using the gap
5 somewhat differently.

6 A I'm sorry, I just realized that. That is
7 the total space in between the fuel bundles, so that
8 would be the total that you'd be subtracting, either
9 your roller diameter or your thickness of your blade
10 from, and dividing that in half.

11 Q But if we can walk through that, let's do it
12 now. .285 is the space in between the fuel bundles,
13 without taking account of the control rods; is that
14 correct?

15 A That's correct.

16 Q The width of the control rod is still .280;
17 is that correct?

18 A Correct.

19 Q So a total difference of .005, which would
20 translate into a gap of .0025; is that correct?

21 A That's right, assuming, of course, everything
22 is straight.

23 Q If I wasn't precise as an engineer -- and I'll
24 tell you I'm not -- can I call that gap essentially zero?

25 A Yes, for practical purposes, that's approximately

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1 the thickness of a piece of paper.

2 Q This is a gap of essentially zero, the control
3 rod would still insert?

4 A Yes, it would.

5 Q Would the difficulty you might encounter at
6 that point be a failure to settle, which you discussed
7 previously?

8 A No, that's only a point at which we can note
9 that it changes, from its normal operation.

10 Q By the way, these numbers that you have, is
11 that the result of tests that General Electric has run?

12 A Yes, it is.

13 Q Do the tests have a name, a name and series?
14 Can you identify them in some way, as how you arrived at
15 what you might call them?

16 A Well, these are actually called -- the
17 title on this report is "Thin Control Rod Qualification
18 Test."

19 Q Can you tell me -- was there a readily
20 identifiable --

21 A The report was actually issued in February of
22 1975. I don't think I have any information here that
23 would indicate if there was any significant time from
24 the point which the test was run until the report was
25 written, but I don't think it was a significant -- maybe

1 a few months.

2 Q Is it a GE report?

3 A Correct.

4 Q Does it have a wonderful GE number?

5 A Yes, it does. 384HA280.

6 Q Does it have a prefix?

7 A No, it does not.

8 Q One of these days I'm going to ask a witness
9 how they got their numbers.

10 Would it be correct that a concern we would be
11 most likely to consider the most serious in terms of
12 clearance in these gaps be the point at which you'd
13 have scrambling problems?

14 A That's right. That's where a safety considera-
15 tion is concerned.

16 Q At what -- I'll use gap the same way, if
17 necessary we can convert the numbers if you have it
18 expressed differently. Was scrambling problems first
19 noted in your test series?

20 A Well, we never were able to get the spacing
21 small enough that we were able to make it so that we
22 would meet scram performance under operating conditions.

23 I think there's a point at which we can
24 notice the -- a change in scram times, I think. I'll
25 do a little searching here to find that.

1 Q Let me see if I can help.

2 Part of this may have been asked and
3 answered.

4 You gave an answer earlier to a question
5 saying that a space of .16 would give you --

6 A This was the point at which we stopped
7 testing, under which we reduced the spacing to that point
8 of .16, and at this point we could still meet scram
9 tech spec requirements, which I believe is five seconds
10 in this particular plant, at operating power.

11 Q Okay. But translate that number. .16 is
12 the space between the fuel assemblies; correct?

13 A Correct.

14 Q The width between the blades is still .280;
15 correct?

16 A Correct.

17 Q Give me a second on this one, because negative
18 numbers always give me some trouble.

19 (Pause.)

20 Check me on this. I get a negative .120;
21 is that correct?

22 A That sounds right.

23 Q That's still not a gap, by my definition,
24 because then I have to divide by two in order to get
25 the space between the blade and the assembly; is that

1 correct?

2 A Yes, which doesn't exist.

3 Q I guess that's true also. I guess gap is a
4 misnomer.

5 In effect, the clearance, if we can meta-
6 physically think of that as clearance, would have to be
7 down to a minus .06, and you still did not experience
8 failure to scram within the requirements under the proto-
9 type testing; is that correct?

10 A That's correct.

11 Q I don't want to play with the numbers, but if
12 I added the upper guide roller to it, we'd end up with
13 even a larger number, negative number; is that correct?

14 A That's right.

15 Q The prototype test did have a number?

16 A Yes, it did.

17 Q How is the prototype test applicable to
18 Zimmer? The same control rods, the same specifications
19 as you would find in a reactor like Zimmer?

20 A Correct. In fact, it was one of the first
21 production control rods that we built of that type.

22 Q You do actually have it installed within a
23 reactor to run these tests?

24 A This is installed in a test vessel. It is not
25 nuclearly heated, it is electrically heated, but other

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1 than that, it has all the same operational characteristics;
2 temperature, water pressure, et cetera.

3 Q Let's see what we've got so far. We've got
4 the prototype test that gives you the knowledge as to
5 all the numbers; is that correct?

6 A Correct.

7 Q We've also got the test for the gauges which
8 are set at numbers that did not rise to the point of
9 giving problems in the prototype testing; is that correct?

10 A Correct.

11 Q Beyond that, are there any plans to perform
12 tests of the Zimmer control rods?

13 A Well, you'll do the pre-operational test.
14 In other words, before you start up your plant, you have
15 to do friction testing and things of that nature on
16 your control rod drive system, which will include the
17 control rod.

18 Q Will such a test show if there are any
19 operational difficulties such as binding or rubbing
20 between the fuel channel and control blades?

21 A Yes, it will.

22 Q How will that show up?

23 A Well, you're going to get an increase in
24 your drive pressure from normal conditions, and also
25 if you happen to have friction that's high enough,

1 your lack of settle alarm will go off.

2 In other words, there is a limitation that
3 the drive has to settle into a notch within eight seconds
4 from initiation to signal until an alarm goes off.

5 Q As I understand it, you will notice the
6 difference in pressure before you rise to the point of
7 having the settle problem; is that correct?

8 A That's correct.

9 Q Do you have an acceptance criteria established
10 that the testers would know when they should do something
11 further?

12 A We've been working on an acceptance criteria.
13 The exact number yet we haven't settled on. It varies
14 somewhere between, well, like the normal driving pressure
15 condition is approximately 70 to 75 times per square
16 inch, and our limiting condition will be somewhere
17 120 and 150 pounds per square inch.

18 Q In reaching the acceptance criteria with
19 respect to pressure regardless of what number you arrive
20 at, what will be the considerations in choosing that
21 number?

22 A Well, it's trying to find a pressure at
23 which the control rod will not settle and the control
24 rod drive actually will not settle into its notch
25 under a minimum drive pressure condition, and so that

1 gets a little bit confusing, but it's a minimum of the
2 maximum drive pressure condition.

3 Q This is delta pressure we are talking about?

4 A In reality, it is not, because under --
5 the vessel is at zero pressure, so you have the static
6 pressure of the water as a delta effect, but for all
7 practical purposes, it's a direct pressure underneath
8 the piston of the drive.

9 Q What I'm confused on is you told me that
10 the problem with the pressure will show up before you
11 get a failure to settle, and then you told me that
12 the acceptance criteria would be set at around that
13 point of having the failure to settle.

14 Now, that's not inconsistent, necessarily,
15 but have I summarized your testimony correctly?

16 A I think that's right. In other words,
17 there's no intent, I think, to having a significant
18 margin between an acceptance limit that says you may be
19 near the -- the no settle condition, because that
20 would probably be a minimum type of a number for most
21 practical, and for almost all practical pieces, the
22 actual no settle pressure would be higher than that.

23 Q So far we've been talking about pre-
24 operational testing; is that correct?

25 A Right.

1 Q Of course, we talked about all the other
2 testing beyond all that. Are there any other tests that
3 will be performed during the life of the facility that
4 would indicate any difficulties such as binding or rubbing
5 or any difficulties with respect to insertion of the
6 control rods?

7 A Well, you always have to do your scram
8 testing before you start a reactor back up during any
9 shutdown.

10 You also have what is referred to as a notch
11 test. I think this is a weekly basis, each control rod
12 has to be jogged once each week to make sure that it is
13 free in motion.

14 Q You testified -- let me take you back to the
15 point just prior to shipment of these control rod
16 assemblies to Zimmer from Cincinnati Gas & Electric.

17 You testified that the .280 gauge test was
18 performed at the point of shipment; is that correct?

19 A That's correct.

20 Q All these control rods passed -- all the
21 control rods that were shipped passed that test?

22 A I think I have to ask you to clarify that a
23 little bit.

24 In other words, the thickness gauge itself
25 plus the use of the famous clamp that we have, it passed

1 that test.

2 Q All right. Are you telling me that the
3 clamping procedure had to be passed?

4 A Yes, that's part of our normal inspection
5 procedure.

6 Q Did you have records that indicate which
7 rods the clamping procedure had to be applied to in
8 order to pass the .280 gauge test at the point of ship-
9 ment?

10 A I don't believe so.

11 Q Wouldn't that be kind of a good idea, so you
12 could match up the test at the point of shipment with
13 the test at the point of arrival?

14 MR. CONNER: Objection, your Honor. Counsel's
15 speculation, while interesting, is not relevant and
16 certainly does not require any answer from the witness.

17 MR. BRENNER: I'd like to finish my question,
18 first of all.

19 Secondly of all, on the theory that they
20 will put the same objection, anyway. That is relevant,
21 this witness is an expert in the area. There was
22 some testimony by the witnesses as to what might have
23 occurred or might not have occurred during the shipment.

24 I'm getting at a way in which in the future
25 we might be able to identify what the proximate cause is.

1 MR. CONNER: Objection, your Honor, this whole
2 line as identified, Mr. Brenner now seems to assume
3 that because a bulge exists, something is wrong. The
4 witness has clearly testified that these rods -- the
5 blades, wings on these rods and so forth, are designed
6 to be flexible, and this is a normal condition.

7 Mr. Brenner is now mischaracterizing the
8 testimony.

9 MR. BRENNER: I spent the last 25 minutes
10 showing it's not wrong, which could have been put in
11 the direct testimony.

12 (Board conferring.)

13 CHAIRMAN BECHHOEFER: I think it's relevant.
14 Objection overruled.

15 BY MR. BRENNER:

16 Q Let me rephrase it.

17 Had you considered a procedure by which
18 you would identify the results of the expansion and
19 testing at the point of shipment similar -- strike that.

20 -- And again identify the specific rods and
21 how they did on the inspection at point of arrival, by
22 which process you would be able to determine whether
23 there were any changes as a result of transportation?

24 A I'm sure that this was kicked around some,
25 but we knew that the fact that if there was some damage
some place, trying to, you might say, categorize that

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1 damage or expect it to be a reoccurring thing, we really
2 didn't think we would encounter that.

3 Q Well, you had 86 out of 137 control rods
4 that didn't pass the acceptance criteria at the point
5 of arrival; is that correct?

6 A No, we had six that didn't pass.

7 Q Now I said the acceptance criteria, the
8 original acceptance criteria.

9 MR. CONNER: Objection, your Honor. The
10 witness is now -- counsel is now arguing with the
11 witness. Let the record speak for itself. This has
12 been asked and answered and been through by almost every
13 counsel, and now Mr. Brenner is arguing with the witness
14 about what he said.

15 The record will speak for itself.

16 MR. BRENNER: I think the witness was going
17 to give me his definition of acceptance criteria, so
18 we can communicate with each other in the following
19 questions.

20
21 END LQ

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MR. CONNER: Mr. Brenner is betting on how he reads the --

MR. BRENNER: Bet your dollar that's what he was going to say.

(Laughter.)

MR. CONNER: You got a dollar?

MR. BRENNER: My witness here --

MR. CONNER: And, by the way, we'd be happy to have Mr. Brenner help tomorrow, even coach.

MR. BRENNER: I'll ask a new question if that will make it easier for everybody.

CHAIRMAN BECHHOEFER: Why don't you try rephrasing this.

BY MR. BRENNER:

Q When I say "initial acceptance criteria," I do not mean the same as your "final acceptance criteria." I mean just the result of the initial checking with the .280 and .320 inch gauge.

Okay, Mr. Pence, do you understand how I'm using the term?

A (Witness Pence) Okay.

Q At the point of arrival at Zimmer, is it not true that 86 out of 137 control rods did not pass that initial acceptance criteria as mentioned in those two cases?

A That's correct.

1 Q Is that the approximate same number that didn't
2 pass that same test at the point of shipment?

3 A I unfortunately don't know that.

4 Q Anybody who would know?

5 MR. CONNER: Objection, your Honor. This was
6 asked and answered. Now he's arguing with the witness
7 again.

8 MR. BRENNER: It's the first time I asked that
9 question.

10 MR. CONNER: Perhaps somebody else did, one of
11 the intervenors.

12 CHAIRMAN BECHTOLD: I can't recall whether it
13 was asked, but I think the witness may answer it anyway,
14 if he knows.

15 WITNESS PENCE: To my knowledge, records are not
16 kept of control rods or which control rods these clamps were
17 used on at the factory.

18 I think the reason for this is it's part of the
19 normal inspection procedure.

20 BY MR. BRENNER:

21 Q Okay. Your expectation based upon what you
22 said about the likelihood of certain damage occurring during
23 transportation and the fact that the same tests are performed
24 at the point of shipment and at the point of arrival, that
25 there were some number of these rods that failed the initial

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1 gauge check without being clamped at the point of shipment.

2 A I'm not sure I totally understood that question:
3 could you give it to me again.

4 Q You testified earlier that many of these bulges --
5 I'm talking about denting now -- are not the type of thing
6 that would have been caused by abnormalities or whatever
7 during transportation because they were "normal"; is that
8 correct?

9 A That's correct.

10 Q Given that, would you expect that some number of
11 these Zimmer control rods that we've been talking about
12 failed the initial gauge checks without being clamped at
13 the point of shipment for the tests GE would have performed
14 before they sent them to Cincinnati Gas and Electric?

15 A Yes.

16 Q Then the procedure is that the same tests are
17 done again by CG & E or their subcontractor at the point
18 of receipt?

19 A That's correct.

20 Q Did anyone from GE communicate to the receiving
21 people, such as CG & E or RCI, that, hey, we've got a lot
22 of rods here that aren't going to pass the initial gauge
23 because they didn't pass it at the point of shipment;
24 but don't get excited because of the procedure.

25 Any communications like that go on?

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1 A Not that I know of.

2 Q Mr. Kananen, is that the correct pronunciation of
3 your name?

4 A (Witness Kananen) Kananen.

5 Q All right, sorry.

6 Are you the man in charge of RCI's responsibility
7 for these tests, the initial gauge tests?

8 A Yes.

9 Q Anybody tell you to expect a bunch of rods that
10 wouldn't pass these tests?

11 A No.

12 Q Would it have helped you in your job on your
13 behalf and on CG & E's behalf and perhaps in communicating
14 to the workers what was going on to have had that information?

15 MR. CONNER: Objection, your Honor, that's
16 irrelevant and immaterial.

17 (Board conferring.)

18 MR. BRENNER: Mr. Chairman, I think it's very
19 relevant because it goes to the lack of communication and
20 misunderstanding that led to some of the allegations in
21 this proceeding and some of the testimony that's been
22 presented in this proceeding.

23 MR. CONNER: Your Honor, that is certainly no
24 grounds for making it a proper question. The facts are
25 what has occurred that has been testified to. Mr. Brenner's

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1 speculation on how to make a more perfect world by 20/20
2 hindsight certainly does not make his question relevant.

3 MR. BRENNER: I'm just trying to help on the
4 theory that they might design another reactor.

5 MR. CONNER: Why don't you talk to them off the
6 record. Quite wasting the board's time.

7 MR. BRENNER: I thought my question was relevant
8 for the reason I gave originally.

9 CHAIRMAN BECHHOEFER: I think it's relevant
10 to some of the charge -- I use the word "charge" -- that
11 we're trying to respond to, so I think the question will
12 be allowed.

13 Objection overruled.

14 WITNESS KANANEN: What was the question again?

15 CHAIRMAN BECHHOEFER: Do you want him to
16 reread it or rephrase it?

17 MR. BRENNER: Let's have that one read back.

18 MR. CONNER: May I rephrase it for him and save
19 time?

20 MR. BRENNER: No.

21 WITNESS KANANEN: It's okay; I can answer it.
22 I don't think it would have changed the way we did the
23 inspections. It might have helped philosophically for
24 us to have peace of mind knowing that they're not -- that
25 we would expect to find these conditions, but other than

avid6 1 that it wouldn't have changed the way that we did the work.

2 Does that answer your question?

3 MR. BRENNER: I guess.

4 I guess it would have also helped saving one
5 day of hearing time and I don't know how many days of
6 preparing testimony, a lot of interrogatories and a lot
7 of other things, for people to have communicated better
8 with their employees as to just what was being done and
9 what was going on.

10 I have no further questions.

11 MR. CONNER: I move Mr. Brenner's speech be
12 stricken from the record.

13 (Board conferring.)

14 CHAIRMAN BECHTOLD: I think Mr. Conner is correct
15 on the windup comments, so granted, we'll strike that.

16 (Board conferring.)

17 MR. BRENNER: Mr. Chairman, I hate to do this,
18 but my cross examination went through a lot of numbers, and
19 Mr. Maxson did catch me on one thing. There's one
20 discrepancy I'd like to clear up with Mr. Pence. I can
21 do it briefly; all the other numbers derive from it.

22 I won't have to go through them all because
23 they'll be there in the record to adjust. It will be very
24 brief.

25 CHAIRMAN BECHTOLD: Go ahead.

david7

BY MR. BRENNER:

Q Mr. Pence, you gave me the space between the fuel assemblies at -- as .562; is that correct?

A (Witness Pence) Yes, I did.

Q Is that the space in the prototype fuel assemblies or the spacing in the Zimmer fuel assemblies?

A The point -- I'm sorry. There is a 20/1000th discrepancy there.

Q I probably confused you; we're talking about the total distance between the fuel assemblies. Is the discrepancy 20 or 40?

A Let's see. Okay, that would be with the water gap -- the distance between the fuel bundles would be 40/1000ths less than what we have been talking about because the fuel channels are 100 mill or 1/1000th thickness instead of an 80/1000th thickness.

Q So the number for Zimmer would then be .522 of an inch.

A Correct.

Q .522 inches; is that right?

A (Nods in the affirmative)

Q And all the other numbers that I did the subtraction from. 1562, I would just adjust by doing it from .522 and end up with a correct answer; is that right?

David8

1 A That's right.

2 MR. BRENNER: No further questions. I appreciate
3 the latitude, Mr. Chairman.

4 (Board conferring.)

5 BOARD EXAMINATION

6 BY DR. HOOVER:

7 Q I'd like to follow-on on some of Mr. Brenner's
8 questions, and this could be directed both to the -- to
9 the panel --I'm not sure who could answer this, but I
10 think we brought up an interesting question.

11 I think I would like to start by asking: in
12 case of this team of people who works on this -- on the
13 fuel assembly, what do the millwrights know about the --
14 what these parts do and the safety functions?

15 Are they required to know anything about the
16 functioning of these parts?

17 A (Witness Kananen) When you say, "are they required
18 to" --

19 Q Do you train them so that they know anything about
20 how these various parts function in the reactor when it is
21 actually in service?

22 A No, we didn't go into operation of the control
23 rods in any great depth. We primarily concentrated on the
24 inspections that we were required to do. It's possible that
25 doing the job, you know, just during conversations, they
might have asked questions like, you know, "How does this

d9 1 work in the core," or something like that.

2 Q If they had no formal training in the matters
3 we've gone through in the examination by Mr. Brenner here
4 about these tolerances, et cetera, and -- essentially,
5 would you say that is correct?

6 A Correct.

7 Q And would you say that they had no training as
8 to ultimate safety significance as to these things?

9 A That's correct.

10 Q In other words, they might imagine that there
11 might be all sorts of safety considerations in these
12 bumps that you found there, that these may not have been
13 actual -- they could have been imagined; would you say
14 that was possible?

15 A That's very possible.

16 Q Well, would it have been helpful to have any
17 training program to let them know what these parts
18 were actually doing and to have avoided all of this
19 controversy that we've had in this last instance; do you
20 think that would be a workable procedure?

21 A Yes. An attempt was made to explain in some
22 detail the operation of the control rods, but it just got
23 to be too involved and got to be too time consuming. That
24 was just sort of an informal "talk as we work" type of
25 situation.

1 And, you know, we did just not pursue it to the
2 end. We didn't feel it was that necessary.

3 Q I'm just interested; Mr. Connors is always
4 interested in time, effort, and money, and so on. I'm
5 just wondering that maybe some of the problems that --
6 that the long hearing processes could be avoided, and
7 ultimately save the rate payers money if the vendors
8 were more communicative with the people that were doing
9 the work.

10 That was my only point in this line of questioning.
11 I don't know whether it would be cost effective or not, but
12 it might be.

13 And I just wanted to inquire as to what was
14 done and whether or not Mr. Brenner's suggestion was of
15 any value.

16 Again, I guess you feel as though there is some
17 value in having this type of information available, and --
18 since you tried such a program, why you at least think
19 it's worthwhile.

20 A Well, from the perspective I have today, it's --
21 I agree with you.

22 DR. HOOPER: Thank you.

23 (Board conferring.)

24 (Staff counsel distributing documents.)

25 MR. CONNOR: If the board please, I would ask the

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press not to interfere with the witnesses while they're
in the witness box and while they're waiting at the request
of the board to resume.

(Board conferring.)

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BY MR. BRIGHT:

Q I just have a few little things that we haven't, oh, really touched on, I guess, and a couple of things that I'd like to clear up my confusion on.

A And, Mr. Ponce you'll have to remember, I'm just a well-meaning physician --

(Laughter.)

-- and do not know how to do these proper questioning routines. So let's don't think of it as cross-examination. Let's you and I just talk.

Would you please, for my benefit, because I heard it twice and I still don't understand it, go through that one-square-inch routine again on the clamp?

A (Witness Ponce. Okay. The area of the clamp that makes contact with the control rod has a small nylon pad which is approximately one inch in diameter -- I think it's a little bit less than that -- and we've approximated that that is fairly close to one square inch in area.

Q Well, let's say that would be the inscribed circle in a one-square-inch rectangle, would it not?

A That's right.

Q And that's more like three-quarters of a square inch? I don't know if it really makes any difference. I want to make sure that we don't call this "one square inch" when it's less than one square inch.

17-2 jwb

1 A I don't know that anybody has specifically
2 measured the part. In other words, I recall that it looks
3 approximately one square inch in diameter, but I don't know
4 that anybody has actually measured it.

5 Q You mean one linear inch in diameter?

6 A Yes. Did I say one square inch? I'm sorry. I
7 mean one inch in diameter.

8 Q Okay, let's go to the other end of the clamp.
9 How do you determine the actual force you put on the part?

10 A It is spring-loaded.

11 Q It's spring-loaded?

12 A It's spring-loaded.

13 Q Can it be adjusted?

14 A No.

15 Q It can't?

16 A No.

17 Q When it has been calibrated?

18 A That's correct.

19 Q So that it will deliver a true reading in
20 pounds per square inch at 40 pounds per square inch?

21 A Well, okay, actually what we've done, we've
22 calibrated that the clamp produces 40 pounds -- I don't
23 know that we've gone through and checked to make sure what
24 the area is, to make sure in what the pounds per square inch
25 is.

3 jwb

1 Q Okay, so then if one wished to be a purist in
2 these matters, one would do it 40 pounds per something less
3 than one square inch, without getting into the gory details
4 of how much less.

5 A It would.

6 Q Fine.

7 One other thing, the question was asked about
8 the function of the holes in the sheath, and there was
9 something about circulation in there, and I thought I heard
10 a statement that, well, they go in a hole, and they cross
11 over to the other side, and go out a hole over there.

12 I -- and, I don't know, I'm just confused. Would
13 you go through that one more time, please?

14 A Okay, the control rod -- we'll consider one wing
15 of the control rod -- has a sheath that is bent and it's
16 on both sides of these series of 19 absorber tubes, and so
17 there are these holes on both sides of this wing so that
18 water can go in one side, and there is a small gap
19 between the absorber tubes and the water --

20 Q Pardon me? The "absorber tubes"?

21 A Yes, sir.

22 Q There are two rows of absorber tubes? Is that
23 the idea?

24 A No there's one row of absorber tubes.

25 Q Okay, but there are gaps between each tube?

17-4 jwb

1 A Yes. In other words, it's not --

2 Q Okay, fine. Pardon me.

3 A -- totally filled up.

4 And the water can go between the absorber tubes
5 and out the holes on the other side. That's one possible
6 flow path.

7 Q Then is what you're saying is that the water in
8 there will follow whatever the hydrodynamic path might be,
9 depending on how the thing is set up?

10 A That's correct.

11 Q And that sort of thing.

12 Well, this takes us to the thermal hydraulics
13 area. Do these absorber tubes really need to be cooled?

14 A Not really.

15 Q They could be just sealed up, and there wouldn't
16 be any problem?

17 A Yes, they could. It may -- if I remember our
18 calculations right, it may have a tendency to reduce the
19 total overall life of the control rod, because you may
20 have a buildup of the hydrogen gas in the absorber tubes at
21 a slightly higher rate, so that you may obtain pressure
22 inside your absorber tubes sooner than you would expect --
23 in other words, instead of being a 15-year life, it might
24 be a 12 or 13

25 Q What is your absorber material?

17-5 jwb

1 A It's boron carbide, B4 C.

2 Q On the thermal side of that, inasmuch as they
3 don't need to be cooled, then any kind of waviness or bow
4 or even, as I think you said, the rod will actually be
5 touching the fuel channel wall, this really doesn't make
6 all that much difference?

7 A No, it doesn't.

8 Q Does it make any difference on the other side
9 of the fuel channel wall where the fuel is?

10 A No, because the majority of the flow is on the
11 inside of the fuel channel in the bundle area. The water
12 that's going past the control rod is only the leakage flow,
13 as we call it, through the joints in the bottom core plate
14 area.

15 Q Okay, then that leads us into a little physics'
16 effects. When you have a -- I assume you have close to an
17 optimum lattice in your plants --

18 A As far as I know.

19 Q -- it's hard for me to know how to phrase some
20 of these questions. You'll pardon me while I chug, chug,
21 chug.

22 What is the effect of having an open -- essentially
23 open water channel in an optimum or close-packed array?

24 A To: -- I'm not sure I totally understand what
25 you're asking

17-6 jwb

1 Q Well, specifically the neutron population.

2 A Yes?

3 Q If you don't feel that you can answer any of
4 these questions, please don't hesitate --

5 A Somehow I have the feeling that I don't know
6 enough nuclear physics to answer your questions.

7 Q Fine.

8 So you wouldn't be in a position to tell me
9 whether the flux buildup due to the asymmetry of placement
10 of the poison which is knocking down the neutron peak in the
11 water gap, that this would make any difference?

12 A No, I don't have knowledge to really address
13 that subject. I do know that all of these different
14 variations have been analyzed by our physics people, and
15 we have no problem with the effects. But what effect
16 they have, you know, percentage-wise or a number like that,
17 I don't know.

18 Q One last little thing. Have you -- I understand
19 that you've done quite a bit of testing in place with
20 mockups, but still the straight goods -- well, I mean flow
21 patterns, and actually the effect of little -- in other
22 words, you have a mockup somewhere where you test blade
23 design. Correct? That's what I should have said to begin
24 with. I'm sorry.

25 Have you -- what do you know about the possibility

17-7 jwb

1 of vibration of these 12-foot long unsupported, perhaps,
2 harps? I mean, do you know enough about it that you're
3 willing to say that within the boundaries of the -- of what
4 we've been discussing here today in terms of numbers, that
5 you have no vibration problem?

6 A I think I can say that. We have very similar
7 type control rods on all of our other plants, and we have
8 some operational experience with rods identical to these
9 that we will put in the Summer plant, and there has been no
10 vibration condition at all.

11 Q That's very good to hear.

12 A Even the design also considers that there might
13 be vibration, and we include that in our design.

14 Q Thank you.

15 (Board conferring.)

16 BY CHAIRMAN DEGENHOFER:

17 Q I just have a few questions.

18 I believe these you should look at from a
19 non-engineer, non-physicist point of view.

20 There was some indication that some of the --
21 let me put it this way: That before some of the blades
22 could pass a test, there had to be a change in the
23 specifications from performing the test? That's my
24 understanding.

25 Who decided whether the revised test specifications

17-8 jwb

1 were proper ones? Was this one where -- Did the NRC staff
2 approve of the change in specs? Or was this -- What I'm
3 worried about is that there might have been a change in
4 specs that perhaps shouldn't have been made without the
5 NRC looking at it and making sure it was proper.

6 I'm not sure which of you can answer the question
7 best, whether it would be --

8 A (Witness Pence) I guess I can answer that
9 question. It was actually the responsible design engineer
10 and myself who evaluated the effect and what changes we
11 could make and still be within our original parameters of
12 our operation of our control rods. And since the only
13 possible problem area that we were addressing was strictly
14 an operational and not a safety question, I guess we never
15 even considered that it was something that should have
16 been reviewed by the NRC, since the original requirements
17 were never reviewed by the NRC.

18 Q So that as far as you know, NRC didn't at least
19 approve the procedure before it was undertaken?

20 A That's correct.

21 Q Didn't -- I assume this dealt with these wavy
22 spots, the placement of the clamps, but isn't the net result
23 of the change in specs that there could be higher spots --
24 I'm not sure that's the right word -- but higher areas than
25 there otherwise would have been if the original testing specs

17-9 jwb

1 had been used?

2 A That's correct.

3 Q Now wouldn't you say there's no -- there's no
4 safety significance, even with these higher spots, which I
5 presume -- First, I presume that the higher places, even if
6 they're held down, will come back and be higher after the
7 clamps are taken off, I believe you testified to that?

8 A That's correct.

9 Q And there still is sufficient clearance so that
10 these rods will move -- I don't know if "freely" is the
11 right word, but -- at least appropriately, but if there
12 has to be a scram, for instance, they still could move
13 freely?

14 Would there be any maximum number of rods that
15 could be afflicted with such high spots before there'd be
16 a safety question?

17 A No. In other words, in reality, every one in
18 the reactor can be afflicted with high spots and there'd
19 still be no safety question.

20 Maybe to give you a little bit of a handle on
21 this, from an operational standpoint we have this approximately
22 150 pounds of friction that results in a "no settle"
23 condition. Compare that to a safety type question, we
24 had to make the control rods have a friction of approximately
25 500 pounds of friction before we could even measure any

10 jwb

1 reduction or change in scan speed.

2 Q Now I understand that there has -- that there is
3 some effect, the friction that you were talking about at
4 one point, the friction could result in greater wear. Is
5 that correct?

6 A That's correct.

7 Q Now are there any, throughout the life of the
8 reactor, are inspections performed to see that the wear
9 doesn't get too great?

10 A In effect, there really is. It's indirectly,
11 since the fuel channels, the fuel bundles are removed
12 periodically, I think the maximum that one fuel bundle is
13 in the reactor is somewhere around five years before it is
14 pulled out, and that fuel channel is taken off and put on
15 a new fuel bundle. So at that time, that particular fuel
16 channel is examined. In all of our tests, we've found that
17 the wear occurs on the fuel channel, and not by the control
18 rod.

19 Q But if there were wear on the control rod, I assume
20 that would be detected as well? Or could that be detected?
21 Or would that be detected through the normal course of
22 inspections that take place?

23 A Well, yes, you would probably see it when you
24 move your control rods. You don't normally leave the
25 control rods in the same place for the entire life. The

18-11 jwb

1 control rod is usually moved from the -- out from the
2 center of the core toward the outer of the core, and vice
3 versa. And when you remove that, I'm sure that if there
4 were any significant wear, it would be seen.

5 But all of our testing, our testing had some
6 significant high spots on it, also. The wear that existed
7 as a result of the rubbing of the rollers -- the rollers on
8 the fuel channels, not between the rubbing of the control
9 rod on the fuel channel.

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1 Q Now with respect to that, I won't call it an
2 exhibit, but it wasn't introduced, but the metal --
3 again I'm using the word shavings to cover broadly, the
4 pieces of metal that were there, but I noticed there were
5 some differences between -- there were some that were
6 considerably larger than others, and I wondered whether
7 you could explain what the source of that is, since
8 some appeared to be just small tiny little specks, and
9 the others -- there was one, at least, that looked like
10 a rectangular shape -- although not precisely rectangular
11 but it was long, it was definitely larger than the
12 speck, and I wondered whether you could explain what
13 the cause of those differences is.

14 A It's only inherent in spot welding that you
15 get significant variations, different shapes of the
16 splash or spatter that comes from spot welding operations
17 sometimes.

18 Q Now would the residue from the chamfering
19 look different?

20 A I would say definitely it would.

21 Q Could the presence of either the
22 residue from the chamfering or the other, the welding,
23 could that have any effect in the wear of the control
24 rods at all, assuming that there was some still
25 present, if there were any remaining around the rods?

1 A It is possible that you might be able to in
2 some way generate a little bit of a high spot there
3 that could cause a little bit of wear, that is correct.

4 Q Is it possible that there could be a high
5 spot when coupled with an already-existing high spot,
6 could reduce the space available -- the space available
7 beyond what is either operationally acceptable or
8 acceptable from a safety standpoint?

9 A I don't really think it could, because your
10 particles are so small you would have to get such a
11 large number of them in one location to make a large
12 enough bulge or high spot to create any kind of a
13 localized wear area, and the total number in a control
14 rod was not that great.

15 You're talking about something that you
16 can hold in the palm of your hand, or it will hardly
17 even cover the bottom of a cup or something like that.
18 You're not talking about a pile of stuff.

19 Q So that even if the cleaning procedures
20 which you described were ineffective, if it all stayed,
21 there still wouldn't be, say, any safety significance?

22 A That's correct.

23 Q You mentioned with respect to the chamfering
24 that the cleaning that took place after the chamfering
25 was different from that which had taken place earlier.

1 I'm not sure you described exactly what the
2 difference was, and --

3 A Well, essentially the cleaning after the
4 chamfering was only intended to remove the residual
5 tape adhesive that was on the control rods for the
6 material that had been used to cover the cooling water
7 holes in the sheath in the area where we were doing the
8 grinding.

9 Q I see.
10 So the residue from the grinding you protected
11 so it wouldn't get in there in the first place?

12 A That's correct.

13 Q And that was successful enough so that you
14 did not have to further clean, I take it?

15 A Right.

16 (Board conferring.)

17 CHAIRMAN BECHTOLD: That's all the questions
18 that the Board has.

19 I can inquire now how long it is likely to
20 take first for redirect, and then for further questions
21 of the parties, whether we should attempt to do that
22 today or start again tomorrow.

23 MR. CUNHA: If the Board wants us to proceed
24 with redirect at this point --

25 CHAIRMAN BECHTOLD: I was trying to inquire

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1 as to time. We want to break fairly soon.

2 MR. CONNER: We'd probably make haste slowly
3 by waiting to start tomorrow, because I need to check
4 some of the things that were stated and some of the
5 numbers that Mr. Brenner was using, so I can't say right
6 at this point. It certainly wouldn't be very long.

7 CHAIRMAN BECHHOEFER: Mr. Brenner?

8 MR. BRENNER: That's fine with me. I don't
9 know if it helps, I've got a few very brief questions
10 as a result of the Board's questions.

11 CHAIRMAN BECHHOEFER: Well, we're going to
12 have that.

13 MR. BRENNER: I can ask those now if you'd
14 like.

15 MR. CONNER: It might be just as well to
16 get that in row, because it would probably relate to
17 those numbers.

18 (Board conferring.)

19 CHAIRMAN BECHHOEFER: Why don't you ask your
20 questions at this stage?

21 MR. BRENNER: I'll still get a shot at redirect;
22 right?

23 CHAIRMAN BECHHOEFER: Yes.

24 MR. BRENNER: In that case, I will do it.

25

CROSS ON BOARD QUESTIONS

BY MR. BRENNER:

Q Mr. Pence, in the GE report, 334HA280, that you referenced previously, is there data on any testing that would go towards the question of long-term wear on channels?

A Yes, sir, there is. It's included in that same report.

Q Can you very briefly tell us what type of testing this was, whether it was -- what it was meant to represent?

A Okay. Basically this is what we referred to as a misalignment test. In other words, taking the assembly of all the equipment inside the reactor, what we call the pump guide and the bottom cooler and all the other equipment, and misaligning it to its maximum allowable condition by the tolerances of the assembly drawings, and running what we call a life test. In this particular case, it was assumed 20 years of life for the control rod, and a number of screws and jogs cycles and et cetera that would be seen during that period of time, or was expected to be seen. And then we examined all the components afterwards.

Q As part of this misalignment test, did you purposely test the control rod blade, if they had a high

ar6

1 spot?

2 A Yes, the blade that was used did have a
3 significant high spot.

4 Q Do you know what the dimension of that high
5 spot was?

6 A With a little bit of research here, I think I
7 can find that.

8 The dimension was .324.

9 Q So the high spot in the prototype life time
10 wear testing was higher than the high spot that could
11 have been present on a control rod accepted for Zimmer;
12 correct?

13 A I believe that's right.

14 Q The Zimmer one is bound at .320; is that
15 correct?

16 A That's correct.

17 Q Do you know offhand what this 20-year life
18 cycling consisted of in terms of numbers of scans
19 and so on?

20 A That will take a little bit of research here.

21 Q Let me give you some numbers while you are
22 looking, and maybe you can confirm them, or disagree
23 with me, if you get to that point.

24 100 full stroke scans, 150 scans from
25 position 12, which is one quarter out, one quarter of the

1 control rod would have to be inserted back in for that
2 scram, and then 1075 normal speed outstrokes.

3 A Those numbers sound correct without me
4 actually going in and verifying them.

5 Q They're within the close range?

6 A Yes, they are.

7 Q Do you know what wear was measured on the
8 sheath first, and then on the channel? That is the side
9 of the fuel assembly, as a result of these lifetime wear,
10 20-year life cycling tests?

11 A Those are some more numbers I will have to
12 double-check. Like 15,000ths or something like that
13 seems to stick in my mind.

14 Q If it will take a while, we can pick those
15 numbers up first thing in the morning.

16 A I have 10,000ths as a maximum depth on a
17 sheath for wear.

18 Q Just to be sure we are clear, that would be
19 .00107

20 A Correct.

21 The maximum depth on the fuel channel was
22 .035.

23 Q All right. I'd like to have those expressed
24 for the purposes of context with the approximate
25 percentage in total thickness with respect to the sheath.

1 I believe you previously testified that the thickness of
2 the sheath was .030 inches; is that correct?

3 A That's right.

4 Q So nominally we have the wear of a third of
5 total thickness of the sheath?

6 A That's correct.

7 Q With respect to the channel, that would be
8 the thickness of the wall or the channel box for Zimmer?

9 Once we got the correction, we learned that thickness
10 was .100; is that correct?

11 A That's right.

12 Q So this wear that the prototype testing
13 report showed .035 inches would be nominally a third
14 or slightly more of that thickness; is that correct?

15 A That's right.

16 Q Would disagreeable wear create any operational
17 problems?

18 A No, it wouldn't.

19 Q I think there's one last question. With
20 respect to this welding of the sheaths wherein it is your
21 view that some of these particles, what you turned up or
22 what we looked at here today, is this welding
23 done after the control rod is placed in the tube?

24 I'm reaching for a word. It's the control
25 rod -- before the fuel pins are inserted.

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1 A The absorber rods, or the pins, are in the
2 sheath and then the spot weld to the center post or the
3 tie rod, as it's called, is made at that point in time.

4 MR. BRENNER: Okay, thank you. I have no
5 further questions at this time.

6 (Board conferring.)

7 CHAIRMAN BECKHOEFER: Okay, we'll break for
8 the day. Be back tomorrow at 9:00 o'clock.

9 The Applicants will put on their redirect.

10 (Whereupon, the hearing was adjourned at
11 5:35 p.m., to be reconvened at 9:00 a.m., Wednesday,
12 August 9, 1979.)

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