

ORIGINAL

OFFICIAL TRANSCRIPT PROCEEDINGS BEFORE

THE ATOMIC SAFETY AND LICENSING BOARD
NUCLEAR REGULATORY COMMISSION

DKT/CASE NO. 50-454 OL & 50-455 OL
TITLE COMMONWEALTH EDISON COMPANY
(Byron Nuclear Power Station 1)
COMMONWEALTH EDISON COMPANY
PLACE (Byron Nuclear Power Station Unit 2)
Rockford, Illinois
DATE March 16, 1983
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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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In the Matter of:           : Docket Nos.:
COMMONWEALTH EDISON COMPANY : 50-454 OL
(Byron Nuclear Power Station Unit 1) :
COMMONWEALTH EDISON COMPANY : 50-455 OL
(Byron Nuclear Power Station Unit 2) :
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United States District Courthouse
211 South Court Street
Rockford, Illinois

March 16, 1983

The hearing in the above-entitled matter
convened, pursuant to notice, at 9:00 A. M.

BEFORE:

- IVAN W. SMITH,
Administrative Law Judge
- A. DIXON CALLIHAN,
Administrative Judge
- RICHARD F. COLE,
Administrative Judge

APPEARANCES:

- On behalf of Licensee, Commonwealth Edison
Company:
- JOSEPH GALLO, Esq.
- M. GWEN HERRIN, Esq.

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Isham, Lincoln & Beale
Three First National Plaza
Chicago, Illinois 60602

On behalf of Nuclear Regulatory Commission
Staff:

STEVEN GOLDBERG, Esq.
RICHARD RAWSON, Esq.

On behalf of the Intervenors:

DAVID THOMAS, Esq.
DIANE CHAVEZ
PAUL HOLMBECK
BETTY JOHNSON

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C O N T E N T S

WITNESSES: DIRECT CROSS REDIRECT RECROSS BOARD

L. G. HULMAN
MILLARD L. WOHL
SCOTT NEWBERY
EDWARD F. BRANAGAN, JR.

By Mr. Thomas	2148		
By Judge Smith			2160
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By Mr. Thomas			2313
By Mr. Rawson			2316

RECESSES:

Morning - 2196

1 JUDGE SMITH: Is there any preliminary business?

2 MR. RAWSON: Yes, sir. The Staff has two
3 preliminary items, if I may, both relating to the
4 testimony on this contention.

5 At the close of the hearing yesterday, we were
6 discussing among the parties and with the witnesses here a
7 possible change on Page 9 of the Staff's prefiled
8 testimony.

9 A change agreeable to Mr. Newberry, the witness in
10 question, was agreed upon and made in the copy that was
11 presented to the reporter at the close of business.

12 For the purposes of the Board and the parties, we
13 thought it would be useful to have Mr. Newberry read into
14 the record the sentence as changed.

15 Mr. Newberry, will you do that, please?

16 (WITNESS NEWBERRY): Yes, I will.

17 I am referring to the sentence in the response to
18 Question 12, Page 9, "We do not differentiate between
19 severe core damage and core melt in this testimony since
20 analyses have not been refined to differentiate the
21 fraction of potential core melt accident sequences that
22 are terminated at severe core damage from those accident
23 sequences that proceed to core melt."

24 MR. RAWSON: Thank you.

25 The second item was a typographical error in the

1 Staff's FES at Page 5-60, which we had intended to fix
2 yesterday, and inadvertently did not.

3 Mr. Wohl, can you address that change, please?

4 A (WITNESS WOHL) Yes. In the second to the last line of
5 the large paragraph at the center of Page 5-60 there is a
6 typographical error.

7 The line should start reading, "0.00026 per reactor
8 year," as it appears in Table 5.13 at the top of Page
9 5-60.

10 That is the average value expected of early
11 fatalities per reactor year.

12 I would like to point out that this figure was not
13 mentioned in yesterday's testimonies, but this is the
14 average number of early fatalities calculated from a year
15 of operation of the Byron plant.

16 MR. RAWSON: That is all we have, Judge Smith.

17 All parties have that.

18 We are ready to proceed.

19 MR. THOMAS: Judge, before I resume my cross
20 examination, I have one housekeeping matter left over from --
21 actually, from last week.

22 This refers to the formula which still appears on
23 the blackboard over there.

24 It is a formula which was referred to by Dr. Morgan
25 in his testimony -- or during his cross examination by Mr.

1 Miller, I believe.

2 I have a written copy of the formula in my hand,
3 which I would propose to make a part of the record to
4 complete Dr. Morgan's testimony, if there are no
5 objections from the parties.

6 MR. RAWSON: Judge Smith, I think the Staff
7 would object to that.

8 The calculation which appears on the board was
9 something that Dr. Morgan started to put on the Board in
10 response to a question.

11 It is my recollection -- I don't have the testimony
12 before me, but it's my recollection that he did not
13 complete his answer on the subject and, in fact, that, at
14 the direction of the Board, he went on to the next
15 question in the middle of his discussion of that.

16 There has been no explanation as to what the terms
17 mean, to what they refer, and I think we would simply be
18 muddying the record by having that put in at this time.

19 MR. THOMAS: Well --

20 MR. RAWSON: Mr. Miller, who was here for the
21 Applicant during that questioning, is not present; but
22 that would be the Staff's position.

23 JUDGE SMITH: There are two discreet aspects
24 implicit in the Staff's viewpoint.

25 One is that he never thoroughly explained the

1 formula, and there was no -- that being the case, there
2 was no opportunity for cross examination on it.

3 If it were to be put in the record, I don't know to
4 what use it would be put in proposed findings or initial
5 decision. I don't know what we could -- what findings of
6 fact we could make from that; but let me confer with the
7 other Board members.

8 MR. THOMAS: Let me just indicate -- of course,
9 we are all trying to recall testimony now that took place
10 approximately a week ago, and probably the only accurate
11 way to do it is to go back to the transcript.

12 It is my recollection that Dr. Morgan did explain
13 what the formula was about. In fact, the formula was
14 elicited during the cross examination of Mr. Miller.

15 So I would --

16 JUDGE SMITH: Well, all right. It may be
17 necessary to go back.

18 I remember my own participation a little bit more
19 clearly; and that is informing Dr. Morgan that his
20 activities on the chalk board were not being translated
21 into the record and were not a part of the record and his
22 activity was not productive. That's what I remember.

23 MR. THOMAS: Yes, I remember you saying that.

24 Perhaps, rather than -- is there a transcript
25 available?

1 JUDGE SMITH: Yes, we will make a transcript
2 available to you --

3 MR. THOMAS: All right.

4 JUDGE SMITH: -- for that purpose and then you
5 can renew your motion after you have identified that
6 aspect of it.

7 MR. THOMAS: Okay. That would probably be a
8 better way to do it than ruling in the dark or on the
9 basis of our collective recollections, which I am not sure
10 of.

11 May I resume my cross examination?

12 JUDGE SMITH: Yes.

13 CROSS EXAMINATION

14 (Continuing.)

15 BY MR. THOMAS:

16 Q Mr. Newberry, of course -- of course, the panel realizes
17 it's still under oath and you are the same panel that I
18 was cross-examining yesterday.

19 Mr. Newberry, does WASH-1400 make the distinction,
20 which you make in your testimony here, between severe core
21 damage accidents and core-melt accident sequences?

22 A (WITNESS NEWBERRY) No, I don't believe it does.

23 It assumes that the sequences proceed to a core
24 melt.

25 Q All right. The core melt being the more severe of the two

1 types of events; right?

2 A (WITNESS NEWBERRY) That's correct.

3 Q Do you think it is a -- well, strike that.

4 In your opinion, would the estimates of WASH-1400
5 have been higher and, therefore, closer to the precursor
6 study if it had estimated the frequency of severe core
7 damage accidents as opposed to core-melt accident
8 sequences?

9 A (WITNESS NEWBERRY) No, sir, I don't think the estimate
10 would have been affected significantly. That's my
11 opinion.

12 Q Okay. Can you explain why you are of that opinion?

13 A (WITNESS NEWBERRY) I think when you get to the point of
14 multiple system failures, multiple functional failures, in
15 these types of sequences, that is very difficult to
16 differentiate between the two.

17 I just don't think that they would have been able to
18 significantly change that estimate by trying to consider
19 if the sequence would be terminated as a severe core
20 damage rather than proceeding to core melt.

21 Q And this is your opinion, even though in your testimony
22 you state that the difference -- and I take it you are
23 talking about the difference between core damage accidents
24 and core-melt accident sequences appears to be
25 substantial?

1 A (WITNESS NEWBERRY) Yes, sir.

2 Q Again, addressing Mr. Newberry, with regard to the subject
3 matter at Question 13 and Answer 13, I believe you made a
4 statement yesterday -- correct me if I am wrong, but I
5 believe you indicated that or made a statement to the
6 effect that TMI dominates the precursor study? Did I hear
7 you correctly?

8 A (WITNESS NEWBERRY) That's correct.

9 Q Now, you state in Answer 13 that 82 percent of the
10 precursor estimates -- or estimate of severe accident
11 frequency comes from three events, and then you discuss
12 Three Mile Island, Browns Ferry, the Browns Ferry fire,
13 and the Rancho Seco power supply failure; is that right?

14 A (WITNESS NEWBERRY) That's correct.

15 Q And you also indicate that these events were not
16 explicitly addressed in WASH-1400; is that true?

17 A (WITNESS NEWBERRY) That's true.

18 Q Of the 82-percent figure which you use there and tie to
19 the three events, can you break that down further and
20 indicate how much of that 82 percent comes from Three Mile
21 Island as opposed to the Browns Ferry fire and the Rancho
22 Seco power supply failure?

23 A (WITNESS NEWBERRY) I can't do it precisely without going
24 back to the precursor study.

25 I believe -- I am trying to recall. I think the

1 Three Mile Island accident contributes about 50 percent is
2 my recollection, but I would have to go back.

3 Q 50 percent of the 82 or 50 percent of the total?

4 A (WITNESS NEWBERRY) Of the total, I believe.

5 I would have to go back and check that.

6 Q Do you have the documents with you that you could check
7 those figures or in the office here?

8 A (WITNESS NEWBERRY) Yes.

9 Q Maybe during the recess you could do that.

10 You also indicated that WASH-1400 did not treat the
11 possibility that the reactor operators might misdiagnose
12 an accident in progress and turn off the safety systems
13 that were necessary to cool the core; is that correct?

14 A (WITNESS NEWBERRY) That's my understanding, yes.

15 Q What is the basis of that understanding; from reading the
16 report?

17 A (WITNESS NEWBERRY) From reading the report and discussing
18 the report with people who are quite familiar with it.

19 Q Okay. And also fires were not included among the accident
20 initiators in WASH-1400; right?

21 A (WITNESS NEWBERRY) That's my understanding, yes.

22 Q Again, on the same basis that you indicated in your answer
23 to the previous question?

24 A (WITNESS NEWBERRY) I think the basis for that statement
25 is primarily discussions with the people familiar with

1 that part of WASH-1400.

2 I didn't review it.

3 Q For the record, can you indicate who these people are that
4 you discussed the report with?

5 A (WITNESS NEWBERRY) Yes, I can.

6 Q Would you do so, please, and indicate their connection
7 with the WASH-1400 Report?

8 A (WITNESS NEWBERRY) I believe the discussions I had
9 regarding fire initiators were with Frank Rowsome of the
10 Staff and Ashok Thadani of the Staff.

11 Q Are they the Staff specialists in these areas?

12 A (WITNESS NEWBERRY) Yes, they are specialists in risk
13 assessment.

14 Q Again referring to Answer 13, you also indicate that the
15 Rancho Seco event was caused by a power supply fault, and
16 a comprehensive analysis of the fault effects and systems
17 interactions originating in power supplies for control and
18 instrumentation was not -- was also not done in WASH-1400;
19 is that right?

20 A (WITNESS NEWBERRY) That's right.

21 Q So, in other words, WASH-1400 did not explicitly address
22 any of the events which resulted in at least three severe
23 accidents; is that right?

24 A (WITNESS NEWBERRY) That's correct.

25 However --

1 Q Well, that is the question.

2 A (WITNESS NEWBERRY) I feel I need to qualify the answer to
3 that question, as I do in the remaining responses,
4 especially on the Rancho Seco events --

5 Q Well, I have some questions --

6 MR. RAWSON: Excuse me. He is entitled to --

7 (WITNESS NEWBERRY): I would like to continue.

8 MR. THOMAS: Judge Smith.

9 MR. RAWSON: I believe he is entitled to explain
10 his answer he gave, and he said he needed to qualify with
11 an explanation.

12 JUDGE SMITH: You don't object to him explaining
13 his answer, do you?

14 MR. THOMAS: Well, I think it's proper for him
15 to explain answers in the redirect portion of his
16 testimony.

17 I think it's a question -- you know, it's a fair
18 question, which is based absolutely on his direct
19 testimony as it appears right here.

20 I do object to him putting -- you know, adding
21 information, which is really not necessary.

22 JUDGE SMITH: Unresponsive, unresponsive to the
23 question?

24 MR. THOMAS: Yes.

25 MR. RAWSON: May I be heard on that?

1 JUDGE SMITH: Sure.

2 MR. RAWSON: The witness gave an answer and said
3 immediately he needed to qualify that with an explanation.

4 I think he is entitled to do that, and I think, for
5 purposes of efficiency, it's better for him to do it with
6 his mind fresh than to do it two hours from now.

7 JUDGE SMITH: The transcript is easier to read
8 when the explanation accompanies the answer.

9 The issue is: Is the additional information
10 responsive to the question or does it tend to be Staff
11 argument, as we have seen in some witnesses in this
12 hearing?

13 I don't know, because he hasn't completed his answer
14 yet; but you understand the point.

15 If you feel that the additional explanation is
16 necessary to respond to the question, fine.

17 If it is additional argument you wish to make, well,
18 then, that should be developed on redirect. Okay? We
19 will let you be the judge.

20 (WITNESS NEWBERRY): Thank you, Judge.

21 I believe -- and I could be wrong, but I thought I
22 heard, as part of your question, that the Rancho Seco
23 events and the Browns Ferry fire were severe accidents.

24 MR. THOMAS: That's true.

25 A (WITNESS NEWBERRY) They were precursors. I don't know

1 that I would classify them as severe accidents. They did
2 not proceed to core damage or core melt.

3 One other point of clarification. The Rancho Seco
4 event, you know, occurred at a reactor quite a bit
5 different from the reactor analyzed in WASH-1400, and it's
6 my opinion that the instrumentation and control system
7 features of that plant lended itself to power supply
8 faults of this type more so than the reactor analyzed in
9 the WASH-1400.

10 MR. THOMAS: Judge, I think that the Browns
11 Ferry portion of the answer is a fair response to the
12 question.

13 I think the Rancho Seco portion is not responsive to
14 the question at all -- in fact, does constitute basically
15 Staff argument -- and I would ask -- I would make a motion
16 to strike the portion of the answer dealing with Rancho
17 Seco.

18 MR. RAWSON: Judge Smith, in particular, for the
19 purposes of efficiency, we are going to elicit the same
20 information on redirect.

21 It is in the record now, and it just seems wasteful
22 of everyone's time to pursue a motion to strike.

23 JUDGE SMITH: That would be the natural result
24 of it. It would be struct here and put back in on
25 redirect.

1 MR. THOMAS: I agree and -- I am sorry. I don't
2 mean to interrupt.

3 JUDGE SMITH: Do you agree, except for that, it
4 should be stricken?

5 MR. RAWSON: Judge Smith, I would say that the
6 very last portion regarding the differences between Rancho
7 Seco and WASH-1400 is arguably beyond the necessary
8 explanation. I think the explanation regarding accidents
9 was clearly right on line.

10 JUDGE SMITH: You are in agreement; and I think
11 we have to give deference to counsel in the way he wants
12 to conduct his cross examination.

13 We may or may not view it as the most efficient way,
14 but he is entitled to a great deal of latitude on the
15 structure of his case.

16 So the motion is granted.

17 MR. THOMAS: Thank you.

18 BY MR. THOMAS:

19 Q Mr. Newberry, the Browns Ferry fire was an accident which
20 went beyond design base, wasn't it?

21 A (WITNESS NEWBERRY) That's my understanding.

22 Q And in that sense, it was a Class 9 accident, although it
23 may not have met the release requirements for a Class 9
24 accident; isn't that correct?

25 A (WITNESS NEWBERRY) I don't think I am really prepared to

1 identify whether the Browns Ferry fire is a Class 9
2 accident or not. It's been a while since I reviewed the
3 details of that, of that accident.

4 Q Well, in the sense that the accident was an accident
5 beyond the design base, don't you think that that was a
6 severe accident?

7 JUDGE SMITH: Do you agree with the unstated
8 premise of that question, that an accident beyond the
9 design base is necessarily a severe accident?

10 Is that the premise of your question?

11 MR. THOMAS: That is the question. It's not the
12 premise. I think that's the specifically articulated
13 question.

14 A (WITNESS NEWBERRY) I think I would agree with that, then --

15 JUDGE SMITH: You agree with what?

16 A (Continuing.) (WITNESS NEWBERRY) -- that an accident
17 beyond the design basis could be termed a severe accident.

18 JUDGE COLE: Any accident beyond the design
19 basis?

20 (WITNESS NEWBERRY): Well, to be honest with
21 you, I have never wrestled with those definitions before,
22 so this is just my opinion on the spot.

23 (WITNESS HULMAN): May I try?

24 JUDGE SMITH: Yes, please.

25 A (WITNESS HULMAN) I think --

1 MR. THOMAS: I --

2 A (Continuing.) (WITNESS HULMAN) I would like to explain
3 how the Staff views the subject.

4 JUDGE SMITH: Let's see what counsel has to say.

5 MR. THOMAS: I don't mind him, in response to
6 the Board's question, again indicating whatever; but I
7 would like the record to be clear that my question to Mr.
8 Newberry -- my question was the Browns Ferry accident and
9 not any accident, so we are sort of switching focus, and
10 that's --

11 JUDGE SMITH: Well, I don't know. You were on
12 the Browns Ferry accident and then you came up with a
13 general question.

14 MR. THOMAS: No, I don't think so, Judge; and
15 that's why I wanted to make the statement.

16 He said that the Browns Ferry accident was beyond
17 the design base, and then I said in the sense that the
18 Browns Ferry accident was beyond the design base, wasn't
19 that a severe accident or a question to that effect, so it
20 was still pegged to the Browns Ferry accident now.

21 JUDGE SMITH: Is your question then -- let's
22 make sure there is no ambiguity in the question and
23 answer.

24 Is your question the following: In the sense that
25 the Browns Ferry accident was beyond the design basis and

1 was a severe accident, conjunctive, then is that a Class
2 9, or is your question that the Browns Ferry accident was
3 beyond the design basis and was, therefore, a severe
4 accident? Is that your question?

5 MR. THOMAS: Yes.

6 JUDGE SMITH: That is what requires
7 clarification by this panel. There is a difference. At
8 least, we perceive a difference, and unless it's
9 explained, we won't know.

10 MR. THOMAS: I agree there is a difference.

11 My question was the second one, and then Judge Cole
12 asked Mr. Newberry any accident, and so then that was the
13 that left the Browns Ferry and went to a generic; and
14 that's the question, I take it, Mr. Hulman is going to
15 respond to.

16 JUDGE SMITH: All right. Let's hear his
17 explanation.

18 MR. THOMAS: Okay.

19 A (Continuing.) (WITNESS HULMAN) The practice has been to
20 establish a number of enveloping accidents called design
21 basis accidents, basically in response to the requirements
22 of 10 CFR Parts 50 and 100.

23 There was a proposal to amend Part 50, I believe,
24 with an Annex A that spoke to what we are presently
25 calling Class 9 accidents.

1 That proposed annex was withdrawn with the
2 Commission policy statement -- I am sorry. It was not
3 Part 50. It was Part 51.

4 That annex was withdrawn when the Commission issued
5 a policy statement in June of 1980 on accident
6 considerations under NEPA.

7 It is explained in our attachment to our testimony.
8 That policy statement is appended and the explanation
9 related to Class 9 accidents is explained in that
10 attachment.

11 Any accident that exceeds the severity of design
12 basis accidents is called either a severe accident or a
13 Class 9 accident.

14 It does not necessarily mean that it leads to core
15 damage, core melt or a release to the environment. It's a
16 term that the Staff has used to simply explain events that
17 have not been considered within the design basis
18 previously.

19 I am trying to differentiate between types of
20 accidents and the names we give them.

21 BOARD EXAMINATION

22 BY JUDGE SMITH:

23 Q Still, the Class 9 table has become a useful term, short
24 term, for a severe accident.

25 A (WITNESS HULMAN) Short term; but there have been recent

1 policy statements proposed to the Commission that do not
2 use the words "Class 9." They use the substitute words
3 now "severe accidents." The ACRS is using the same
4 terminology.

5 Q Is a severe accident one beyond the design basis?

6 A (WITNESS HULMAN) Yes.

7 Q With potentially severe consequences?

8 A (WITNESS HULMAN) Yes.

9 Q Is that a necessary attribute to a severe accident, that
10 it have potentially severe consequences?

11 A (WITNESS HULMAN) Yes; but there isn't a one-to-one
12 correspondence. I can have a severe accident that is
13 benign in terms of health consequences --

14 Q Yes.

15 A (WITNESS HULMAN) -- totally benign.

16 Browns Ferry is an example.

17 Q But it has to have the potential?

18 A (WITNESS HULMAN) Correct.

19 Q Is there such a thing as an accident beyond the design
20 basis which does not have the potential for severe
21 consequences?

22 A (WITNESS HULMAN) I would say no.

23 JUDGE SMITH: Mr. Thomas.

24 BY MR. THOMAS:

25 Q Okay. Then, Mr. Newberry in Question and Answer 14, the

1 question is posed, "Why do these omissions in WASH-1400
2 not invalidate the severe core damage frequency estimates
3 today with respect to their use in the Byron FES?"

4 In response to that posed question you give an
5 answer of approximately two pages in length, in which you
6 discuss the specific fixes that were done for the TMI,
7 Browns Ferry and Rancho Seco events; is that correct?

8 A (WITNESS NEWBERRY) That's correct.

9 Q Is that -- are those specific fixes for those three events
10 the only basis for your opinion or conclusion that these
11 omissions in WASH-1400 do not invalidate the severe core
12 damage frequency estimates of that report?

13 A (WITNESS NEWBERRY) No. I think I would have some other
14 comments to add, perhaps based on information that I have
15 collected since I wrote this testimony.

16 Q All right. I will, you know, let you do that.

17 But at the time you wrote this testimony, was this
18 the sole basis for that conclusion or opinion?

19 A (WITNESS NEWBERRY) That's correct.

20 Q All right. Now, was this testimony written in February of
21 this year?

22 A (WITNESS NEWBERRY) I think that's correct.

23 Q Okay. What have you learned since you wrote this
24 testimony in February which you think also supports your
25 opinion or conclusions stated in Question and Answer 14?

1 A (WITNESS NEWBERRY) Well, at recent review meetings on the
2 precursor study, which I must say is still under review,
3 extensive review, it's my understanding that the
4 methodology used in the precursor study tends to
5 overestimate the frequencies of severe core damage,
6 primarily because of its attempt to use what has been
7 termed a generic event tree, an event tree that doesn't
8 necessarily describe the as-built plant, the many as-built
9 plants in the country; and because of that, it left out
10 certain systems and capabilities in the plant that could
11 further reduce the likelihood of severe core damage.

12 Q What -- okay. That deals with the precursor study.

13 Your answer here talks about the continued validity
14 of the estimates of WASH-1400.

15 What do those criticisms of the precursor study have
16 to do with the continued validity of WASH-1400?

17 A (WITNESS NEWBERRY) My answer was, I guess, centered on my
18 thought that you were focusing on the invalidity of
19 WASH-1400 based upon the precursor study.

20 Q I am just focusing on the question, as posed in your
21 testimony, and the answer, which I don't see any reference
22 in -- well, I am sorry.

23 You are right. In the last sentence you do. You
24 say it's not invalidated by the precursor study. All
25 right.

1 But is there anything else regarding WASH-1400
2 itself, without reference to the precursor study, which,
3 in your opinion, is support for the continued validity of
4 WASH-1400 other than what you discuss in your answer?

5 A (WITNESS NEWBERRY) Well, I think so.

6 What I tried to do in my review was really to look
7 at the WASH-1400 sequence estimates used in the FES and
8 see if I could make a judgment whether they were
9 reasonable or not.

10 To do that I had to consider, the best I could, what
11 information has become available since WASH-1400 was done.

12 One of those, you know, is -- the precursor study
13 was one part of that, one of the things that I looked at.

14 There are other PRA's done since WASH-1400, the Zion
15 PRA, the Indian Point PRA; and, really, what I did, in
16 addition to looking at the precursor study, was to
17 consider all of this additional work, to the best I could,
18 realizing I didn't have a plant specific PRA on Byron, but
19 to consider what we had learned since WASH-1400 and see if
20 it would significantly affect the estimates used in the
21 FES.

22 Q Don't you think that a Byron plant specific PRA would have
23 been helpful to you in arriving at your judgment?

24 A (WITNESS NEWBERRY) Perhaps.

25 Q How much would it cost to do a Byron plant specific PRA?

- 1 A (WITNESS NEWBERRY) I don't know.
- 2 Q Can you give an estimate?
- 3 A (WITNESS NEWBERRY) No.
- 4 Q Have you ever done a plant specific PRA?
- 5 A (WITNESS NEWBERRY) No.
- 6 Q Again referring to Question and Answer 14, you indicate
7 that because of specific fixes related to the Three Mile
8 Island accident, operator errors of this type are less
9 likely today than they were before TMI.
- 10 What do you mean by "of this type?"
- 11 A Errors of misunderstanding the plant's conditions, such
12 that the -- for example, on Three Mile Island, a
13 misunderstanding that caused him to terminate a safety
14 system.
- 15 Q Are you aware of the estimate in the precursor study that
16 approximately 38 percent of all significant precursors
17 involved human error?
- 18 A I don't recall that precise estimate, but I guess I do
19 remember discussions of human error being significant,
20 yes.
- 21 Q Do you agree with that statement, that estimate?
- 22 A (WITNESS NEWBERRY) I haven't made an independent
23 assessment, so I don't know.
- 24 Q So you don't have any opinion on it?
- 25 A (WITNESS NEWBERRY) No.

1 Q Okay. How much less likely are operator errors of this
2 type referred to in Answer 14 as a result of the TMI fix?

3 A (WITNESS NEWBERRY) I don't think I would be able to
4 quantitatively respond to your question.

5 I think that's just a qualitative judgment, on not
6 only my part but the NRC Staff.

7 Q Can you give some parameters to that qualitative judgment?

8 A (WITNESS NEWBERRY) What sort of parameters?

9 Q Well, that there is hardly any chance of that happening or
10 there is less -- I don't know. Whatever terms you would
11 feel comfortable with, since we can't do it
12 quantitatively.

13 I am just trying to, you know, figure out exactly
14 what's being said there.

15 If you can't define it any further, then indicate
16 that.

17 A (WITNESS NEWBERRY) No. I guess I would stand by what I
18 said in my response to the testimony.

19 Q Are you familiar with the recent problems at Salem where
20 the operators apparently didn't notice that the automatic
21 shutdown system didn't work on two occasions because of
22 circuit breaker failure?

23 A (WITNESS NEWBERRY) I am not sure I would agree with your
24 characterization.

25 I have discussed some aspects of the event with

1 people, yes.

2 Q Okay. What is your perception of what happened at Salem?

3 A (WITNESS NEWBERRY) Realizing, again, my perception is
4 based upon discussions with people -- I don't know that
5 they are exactly correct or not.

6 Q I understand.

7 A (WITNESS NEWBERRY) -- that an automatic SCRAM signal was
8 generated by the reactor protection system and that
9 neither SCRAM breaker opened, initiating an automatic
10 SCRAM. However, they were -- the SCRAM was initiated
11 manually by the operator.

12 Q Didn't this happen twice, the failure of the automatic
13 initiation?

14 A (WITNESS NEWBERRY) I don't know for sure.

15 A (WITNESS HULMAN) May I add, I understand that there was
16 one event where it failed to open for certain.

17 The other event, it is not clear whether it failed
18 to open or whether the operator intervened before it could
19 have opened.

20 The subject of the Salem failure to SCRAM is the
21 basis of a Staff task force investigation at the moment.

22 Q The NRC -- does the NRC have a precursor list?

23 A (WITNESS NEWBERRY) I don't know of any precursor list.

24 I know there are several activities ongoing in the
25 Staff to review operating experience of plants on a

1 day-to-day basis to see what can be learned.

2 BOARD EXAMINATION

3 BY JUDGE SMITH:

4 Q So the Staff has a program of evaluating LER's, licensee
5 event reports, to look for patterns?

6 A (WITNESS NEWBERRY) Yes, sir, that's correct. That is
7 done in the -- I guess it's called the Office of AEOD.

8 Q Then in respect to Mr. Thomas' earlier question, has the
9 Staff been able to see any change in the frequency of
10 operator error licensee event reports, which possibly
11 could be attributable to improved training or, perhaps,
12 demonstrate that improved training has not yet been -- has
13 not yet manifested itself in the LER's?

14 Is there any information that we have or that you
15 have on that?

16 A (WITNESS NEWBERRY) That's a good question.

17 I don't really have any information on that.

18 I am not sure that you would see an effect of
19 improved training, so to speak, in the LER reporting
20 system.

21 Q Ever or yet?

22 A (WITNESS NEWBERRY) Ever, really.

23 Q One of the action plan items from the lessons learned, I
24 believe, requires utilities to maintain a function which
25 analyzes a licensee event report from other utilities and

1 passes the information learned on to the cognizant
2 official, the operators.

3 That suggests, possibly, that the utilities
4 themselves, INPO, perhaps, might have such a program.

5 Do any of you gentlemen have any information on
6 that?

7 A (WITNESS HULMAN) It's my understanding that INPO provides
8 that service for the utilities.

9 Staff has a complementary service and Staff is
10 making its own judgments on LER experience.

11 There is a TMI item on that.

12 Q Is one of the classifications that the Staff looks at in
13 the LER analyses operator error?

14 A (WITNESS HULMAN) I think every LER is judged on whether
15 it's a mechanical failure, a design flaw or human error.
16 On every LER a judgment is made.

17 Under the reporting system, each utility that
18 reports an LER is supposed to determine cause, and they
19 are generally grouped into those categories.

20 Q I am curious then why, perhaps, Mr. Newberry feels that
21 improvement in operator training will not be reflected in
22 the LER patterns?

23 A (WITNESS NEWBERRY) I guess, perhaps, I was thinking of
24 operator training in a more narrow sense than you, Judge;
25 for example, LER's that come in on an equipment failure or

1 something of that nature, which could be design related or
2 human related or what have you.

3 I was thinking of operator training in response to,
4 you know, a dynamic event at the plant.

5 In that sense, I don't know that you would see it in
6 the LER data base, but perhaps, in terms of component
7 failures and things of that nature, you could see a trend
8 and see what are related to operator errors and which are
9 not.

10 Q Of course, complicating the problem further would also be
11 the change in staffing requirements, too, would it not?

12 I see Mr. Hulman is shaking his head yes and you are
13 in doubt. That was very much a leading question.

14 That would complicate the analysis, however,
15 wouldn't it?

16 A (WITNESS NEWBERRY) Yes, sir, I think so.

17 MR. THOMAS: Okay. Thank you, Judge.

18 BY MR. THOMAS:

19 Q Mr. Newberry, on Page 11 you indicate that Byron is being
20 reviewed against the requirements of the new NRC fire
21 prevention rule as embodied in Appendix R to 10 CFR 50.

22 What is the status of that review?

23 A (WITNESS NEWBERRY) I don't know exactly the status. I
24 know it's ongoing.

25 Q Have any conclusions been arrived -- been made yet?

1 A (WITNESS NEWBERRY) I am not sure; only that the review is
2 ongoing, and I think the most recent status is in the
3 safety evaluation report, published status.

4 Perhaps, you know, as the review moves on, more
5 conclusions have been drawn, but I don't know that they
6 have been documented anywhere.

7 Q Is it an ongoing review, to your knowledge? I mean, is it
8 in process at the present time?

9 A (WITNESS NEWBERRY) That's my understanding.

10 Q What is involved in that review?

11 A I am not that -- you know, I am not involved in the
12 Appendix R review. I don't think I have detailed
13 comments.

14 Q What are the consequences for Byron if they are judged to
15 be deficient regarding the requirements of the new rule?

16 A (WITNESS NEWBERRY) Byron will be required to satisfy the
17 requirements in the rule. That's my understanding.

18 Q And if they don't or can't?

19 A (WITNESS NEWBERRY) I assume they won't be granted a
20 license.

21 Q Do you know when that review is scheduled for completion?

22 A (WITNESS NEWBERRY) No, I don't.

23 Q Do you know if it's before the fuel loading date?

24 A (WITNESS NEWBERRY) No, I don't.

25 Q Mr. Wohl, regarding your testimony in Answer 18 on Page

1 16, where you discuss some of the lessons learned from
2 TMI, is it true that some of the lessons from TMI included
3 action on liquid pathways?

4 A (WITNESS WOHL) I am not certain that the lessons from TMI
5 included action on liquid pathways, but that sort of
6 action has been in force for a long time.

7 Q I guess --

8 A (WITNESS HULMAN) Maybe I can answer the question.

9 I was responsible for -- at the time the lessons
10 learned and action items were put together at post-TMI, I
11 was responsible for putting in the liquid pathway.

12 Q Okay.

13 A (WITNESS HULMAN) It was not a direct result of the actual
14 accident at TMI.

15 The reason it was put in was it was a possible
16 outcome of an uncontrolled TMI if TMI had progressed to a
17 much worse state.

18 Q I don't mean to interrupt you but when you say it was put
19 in, what are you referring to when you say it?

20 A (WITNESS HULMAN) After the TMI accident, the Staff put
21 together a collective document and identified a number of
22 post-TMI areas of concern.

23 One of those areas was related to the liquid
24 pathway.

25 Q Okay. What was stated in there regarding liquid pathway?

- 1 A (WITNESS HULMAN) It should be considered, and the bases
2 for the consideration and the bases for including it were
3 stated in the document. The document name, post-TMI
4 action plan, I don't have on the tip of my tongue; but it
5 was done in the same context with most of the other
6 so-called post-TMI action items.
- 7 Q Have any specific changes been made in the Staff approach
8 to liquid pathways as a result of this action document?
- 9 A (WITNESS HULMAN) Yes. The principal change is to include
10 the subject and its analysis in environmental impact
11 statements in our FES's.
- 12 Q That was not done before?
- 13 A (WITNESS HULMAN) It was not done to the extent that it's
14 now done with the range of considerations that are
15 presently done.
- 16 Q Well, has this more comprehensive review, if that's a
17 correct characterization, regarding liquid pathways been
18 applied to Byron?
- 19 A (WITNESS HULMAN) It has, and we discussed the issue
20 related to the March 11th letter from the Applicant
21 yesterday.
- 22 Q Yes.
- 23 A (WITNESS HULMAN) That discussion on liquid pathways is
24 one result of the post-TMI action item on liquid pathway.
- 25 Q Are there any other results that you can identify with

1 relationship to Byron?

2 A (WITNESS HULMAN) Yes. One of the concerns during the
3 actual accident at TMI was if the accident were to
4 progress to the point where base mat penetration were to
5 have occurred, there was concern over contamination of the
6 liquid pathway both on Three Mile Island and in the
7 adjacent Susquehanna River.

8 There were users of those water supplies and the
9 ability to interdict that pathway, if necessary, was of
10 concern both during the course of the accident and
11 afterward. That was the principal reason for bringing the
12 issue into the multi-plant action item list.

13 Since the bringing of them into the list, the Staff
14 has done a number of things with liquid pathway that are
15 of interest.

16 Staff has basically concluded that at most sites,
17 even if there is base mat penetration, that the liquid
18 pathway is interdictible, that is, that we can prevent by
19 engineering means the contamination of water supplies. We
20 can prevent contaminated water from reaching people and,
21 basically, exceeding acceptable dose levels. We can do a
22 much better job in both cases of preventing doses to the
23 liquid pathway than we can through the atmospheric
24 pathway.

25 There were some studies done, one of which was done

1 at Argonne, that confirmed the Staff perception that the
2 interdiction methodology is indeed technically feasible.

3 Q But you don't know whether this applies to Byron, because
4 no plant or site specific analysis has been done at Byron;
5 isn't that correct?

6 A (WITNESS HULMAN) No.

7 Q The Staff --

8 JUDGE SMITH: No, that is not correct or no, the
9 analysis has not been done?

10 A (WITNESS HULMAN) No, that is not correct. The question
11 is false. The analysis has been done and it appears in
12 the FES. It's in question at the moment but it has been
13 done.

14 BY MR. THOMAS:

15 Q Mr. -- all right, let me just finish up.

16 Are there any other specific liquid pathway lessons
17 learned from TMI which have been applied to Byron?

18 A (WITNESS HULMAN) I think that beyond what I have told
19 you, I can't identify any; but I have not been active in
20 that particular technical area for a couple of years.

21 I understand there will be Staff witnesses that are
22 active and did perform the specific evaluation for Byron
23 that are scheduled to appear.

24 Q During the liquid pathways portion of this hearing?

25 A (WITNESS HULMAN) Correct.

1 Q Okay. Mr. Wohl, directing your attention to Answer 18,
2 Page 16 of the prefiled testimony, you indicate that the
3 Applicant is developing emergency response guidelines
4 which will consider multiple failure events.

5 What is the status of those emergency response
6 guidelines?

7 A (WITNESS WOHL) The -- first of all, let me say that I
8 don't have the function of reviewing these guidelines; but
9 there is a program in the Office of Inspection and
10 Enforcement underway for continuous upgrading of the
11 guidelines and for the institution of emergency response
12 facilities which have multiple components in order to
13 provide proper response to any accident beyond design
14 basis. These are under continuous review now, and the
15 reviews of the emergency response facilities are to begin
16 later this year, probably early fall.

17 Q Have you seen any emergency response guidelines from the
18 Applicant?

19 A (WITNESS WOHL) I have not seen this Applicant's emergency
20 response guidelines. I don't have responsibility for
21 reviewing them.

22 I have had some input in a helping way to the review
23 program for emergency response facilities.

24 Q Then you don't know when those emergency response
25 guidelines will be complete?

1 A (WITNESS WOHL) I don't know.

2 Q Or final?

3 A (WITNESS WOHL) No, I don't know the completion dates.

4 I would like to point out something in connection
5 with this that --

6 Q Well, Staff will have the opportunity to ask you
7 questions.

8 A (WITNESS WOHL) All right.

9 Q I have a few questions regarding the FES and I don't know
10 who would be the exact person on the panel to direct these
11 questions to, so let me pose the question and then whoever
12 feels most qualified to respond may do so.

13 At Page 5-36, under "exposure pathways," the last
14 sentence states in part, "accident consequences are very
15 much dependent upon the weather conditions existing at the
16 time."

17 My question is: Is that a correct statement?

18 A (WITNESS HULMAN) Yes.

19 Q Given that fact, that means that accident consequences are
20 very dependent upon what is an uncontrollable variable;
21 isn't that right?

22 A (WITNESS WOHL) I --

23 A (WITNESS HULMAN) The word, "uncontrollable variable,"
24 they are dependent upon the conditions that occur at the
25 time of the accident.

1 Q Right.

2 A (WITNESS HULMAN) They are not -- the weather is not
3 controllable, that's true.

4 Q Right.

5 A (WITNESS WOHL) I would like to add to that that our
6 analyses, the results of which appear in all the figures
7 in the FES, contain a sampling of 91 different start times
8 using the CRAC code, so that really we do a random
9 sampling with the Monte Carlo Method of 91 different
10 situations, so in presenting an average environmental
11 risk, we are not homing in on one particular
12 meteorological condition or another but taking what we
13 consider to be representative average and producing the
14 numbers which are later presented as average risks.

15 Q Is there -- in that average, were the local weather
16 conditions in this?

17 A (WITNESS HULMAN) Yes.

18 A (WITNESS WOHL) Yes. There is a full year's worth of
19 local representative meteorological data, taken at the
20 tower at the Byron site, which tower is visible if you
21 take a ride out to the Byron site.

22 I might add in the event of an actual, severe
23 accident, actual real time meteorological data is used in
24 formulating an emergency response to that accident, so we
25 do not in the event of an actual threatening situation

1 depend on these average numbers at all. These are merely
2 in here to produce the numbers in the FES.

3 Q What is the worst case scenario under the figures which
4 you used?

5 A (WITNESS WOHL) The worst case scenario would be a very
6 energetic release, which compromises the containment,
7 containing a high sensible heat, which produces a very
8 elevated plume, which is then carried by a very strong
9 wind toward a high population center, above which there is
10 then precipitation, which brings the contents of the plume
11 down in exactly the place where you would not like it to
12 appear; but this is a hypothesized situation only and the
13 likelihood of its occurring is miniscule.

14 Q Well, we certainly have a high population center close by
15 in Chicago, don't we?

16 A (WITNESS WOHL) Yes; but one can postulate --

17 A (WITNESS HULMAN) I am sorry. There may be some
18 disagreement between Mr. Wohl and I.

19 Why don't you answer the question and then I will
20 disagree based upon what you have said so far.

21 I think I am objecting to your question. I am not
22 sure that Chicago is nearby.

23 Q Within 100 miles, isn't it?

24 A (WITNESS HULMAN) It's within 100 miles.

25 Q That is certainly within a range that a wind could carry

1 the plume which Mr. Wohl talked about, isn't it?

2 A (WITNESS HULMAN) Depending on which way the wind blows,
3 that's correct; but I would not characterize it as nearby.

4 Q Mr. Wohl, did you say that you fed a year's worth of
5 meteorological conditions in?

6 A (WITNESS WOHL) The data that we used in the calculation
7 is based upon a full year's sampling of meteorological
8 data at the site.

9 Q What about historical conditions? Is any effort made to
10 determine whether that year is representative of weather
11 conditions in historical terms?

12 A (WITNESS WOHL) There are judgments like that made by our
13 meteorology Staff. They inspect the data and they look for
14 any anomalies or things that they would consider to be
15 non-representative and question it if necessary.

16 Q Now, referring you to -- referring the panel to Page 5-41,
17 in the discussion of site features, there is a reference
18 to emergency preparedness and then immediately under that
19 section is the section on emergency preparedness, and the
20 statement is made, "Emergency preparedness plans,
21 including protective action measures for the Byron Station
22 and environs are in an advanced but not yet fully
23 completed stage."

24 Is anybody on the panel aware of the present status
25 of the emergency planning or the emergency planning

1 considerations in this case?

2 A (WITNESS HULMAN) It's my understanding that that subject
3 is to be discussed at this hearing; and, in any event, it
4 is to be resolved and completed prior to granting an
5 operating license.

6 Q That is your understanding?

7 A (WITNESS HULMAN) That is my understanding.

8 Q I would further note that on Page 5-46 there is another
9 reference to emergency planning, where it states, "The
10 consequence model also contains provision for
11 incorporating the consequence reduction benefits of
12 evacuation, relocation and other protective actions."

13 The question is: What reliance has been placed upon
14 emergency planning actions such as evacuations in arriving
15 at the Staff's conclusions contained in the FES here?

16 A (WITNESS WOHL) We have done, based upon a submittal from
17 the Applicants, an analysis of the way in which they
18 propose to evacuate the ten-mile EPZ; and our analysis, I
19 feel, is quite conservative.

20 We have used an effective radio evacuation speed of
21 1.34 miles per hour for people within the EPZ, within the
22 ten-mile radius.

23 This is approximately 40 percent of the speed at
24 which the average, fit adult could walk out of the EPZ
25 without any help, vehicles or anything else.

1 So that in terms of the benefits from the emergency
2 preparedness activities included in our analyses, we don't
3 take a great deal of credit for that.

4 Q What was the date of the submission by the Applicant of
5 this, of this plan or this submittal that you referred to?

6 A (WITNESS WOHL) I will see if I can find it, if you will
7 give me a minute.

8 August 29, 1980, letter from L. O. DelGeorge to D.
9 G. Eisenhut at NRC.

10 Q That is the latest submittal that's been --

11 A (WITNESS WOHL) That was the latest we had at the time the
12 analyses were performed.

13 Q Has there been any attempt to update the assessment based
14 upon any changes in that plan?

15 A (WITNESS WOHL) I am sure there are upgradings going on
16 continuously but I want to repeat: The evacuation speed
17 that we used is, in my opinion, based upon all the work
18 that I have done in this area, with this and other plants,
19 a very conservative one. So that even if we were given
20 data which would provide a new evacuation speed, I would
21 not expect that our results would be non-conservative on
22 that count.

23 Q Now, on Page 5-45 the statement is made -- and this
24 touches somewhat on something that we discussed yesterday --
25 but the statement is made, "The data base for assessing

1 the probabilities of external events more severe than the
2 design bases for natural phenomena or sabotage is small,"
3 and indicates that inclusion of accident sequences based
4 on external events, basically, is beyond the state of the
5 art of probabilistic risk assessment.

6 Then it goes on to say, "The Staff judges that the
7 additional risk for severe accidents by external events is
8 within the uncertainty of risks presented for the
9 sequences considered here."

10 My question is: What is the basis for that
11 judgment, given the fact that -- given what is stated
12 immediately prior to that conclusion?

13 A (WITNESS HULMAN) I tried to explain yesterday that --

14 Q Does this get back to the qualitative judgment that we
15 discussed yesterday; is that what it is?

16 A (WITNESS HULMAN) Basically the qualitative judgment; but
17 in an attempt to define what an absolute outside number
18 might be, we chose to put what we call a confidence limit
19 on the subject of how bad can it be.

20 We still stand by the numbers in the FES as reasoned
21 numerical estimates from the risks of accidents at the
22 Byron Station.

23 Q All right. But since Staff did not do a PRA for Byron,
24 there are no calculations to show that that, in fact, is
25 the case, are there?

1 A (WITNESS HULMAN) No, I don't agree with that statement.

2 Q All right. Let me put another question.

3 Other than taking 1400 and re-baselining it, as you
4 state, there are no calculations to support that
5 determination, are there?

6 A (WITNESS HULMAN) That is not correct.

7 Q What are they?

8 A (WITNESS HULMAN) There are a number of calculations that
9 have been done. There have been specific PRA's done at
10 other reactors. There were computations made specifically
11 for this reactor.

12 Q But not based on any specific study of this reactor; is
13 that correct?

14 A (WITNESS HULMAN) I am having trouble with what you mean,
15 "this specific reactor."

16 Q Byron.

17 A (WITNESS HULMAN) We did not do a PRA for Byron. We did
18 do PRA's or reviewed PRA's at other reactors, compared
19 them to what was in WASH-1400 and re-baselining the
20 WASH-1400. We did do specific consequence calculations,
21 specific liquid pathway computations, specific evaluations
22 of meteorology and population density, we did specific
23 economic analysis for these sites.

24 All of this is referred to in the FES. So when you
25 say no specific computations for Byron, I don't think I

1 can agree with that.

2 Q Have you ever done a site specific PRA?

3 A (WITNESS HULMAN) PRA's are not done for sites directly.
4 PRA's are done generally for the systems and components
5 inside the plant and the results are measured in terms of
6 risks in the site region.

7 Q Would plant specific be a better term?

8 A (WITNESS HULMAN) I have participated in the review of
9 PRA's. I have been involved in what we call mini-PRA's of
10 systems and components.

11 Q Have you ever done a PRA for a plant such as Byron?

12 A (WITNESS HULMAN) No.

13 Q Do you know how much it would cost to do such a PRA or do
14 you have an estimate?

15 A (WITNESS HULMAN) No, I have no idea of what it would cost
16 and I could not speculate on what it's likely to cost.

17 Q Do you know how long it would take to do such a PRA?

18 A (WITNESS HULMAN) That's even more difficult to answer
19 than the question of money. It depends on the amount of
20 money and resources that a particular utility might bring
21 to bear.

22 MR. THOMAS: Judge, I believe those are all the
23 questions I have of the panel at this time.

24 JUDGE SMITH: All right. The Board does have
25 some curiosity about the very large document that was

1 delivered to us, in my case, just put aside because it was
2 clear it was not an exhibit. It was more of an
3 identification item.

4 But it looks like it purports to be a PRA.

5 MR. THOMAS: That's what it says on the cover.

6 JUDGE SMITH: Now, I guess we don't have to know
7 the answer to this to decide the issues, and counsel can
8 take and bear that in mind in formulating your response;
9 but we certainly are curious as to why a PRA may have been
10 done for the plant and the Applicant elects not to take
11 credit for it.

12 Does counsel care to give us any explanation for it,
13 if, in fact, the premise of our question is correct, if,
14 in fact, there has been a PRA done?

15 MR. GALLO: Well, Judge Smith, the document that
16 was circulated under a letter signed by my colleague, Mr.
17 Miller, is not quite what is known in the trade as a Level
18 3 PRA.

19 It is close to that type of rigorous document but
20 it's not quite, because it relies to some extent on the
21 work done at Zion.

22 As Mr. Miller's letter indicated to the Board and
23 the parties, there are aspects of that PRA that may be
24 used and relied upon as a source by witnesses in this
25 case.

1 Indeed, the testimony of one of the steam generator
2 witnesses does use some of the information developed in
3 that document as a source for his testimony. I am
4 referring to Mr. Issler.

5 The reason we have not used it in the -- beyond what
6 I have described in evidentiary presentations is that the
7 document was prepared primarily for the utility's internal
8 use.

9 The document is not required by Commission
10 regulations and, frankly, we believe as a litigation
11 matter, if we were to insert the document as an exhibit,
12 we might double the expanse or the length of the hearing.

13 Beyond that, the Staff doesn't require it and we
14 believe that if we were to put it in as an exhibit it
15 would force the Staff to form an opinion with respect to
16 it.

17 The Staff I think would say, if asked, they could
18 not form an intelligent opinion with respect to the
19 document for some months and another reason why we are not
20 using it as an exhibit. We do not want to trigger a
21 situation where this record has to be held open while we
22 wait for the Staff's assessment.

23 Since it's not required as a matter of Commission
24 regulation, it seems to me there is no sense to impose
25 this burden on the Staff.

1 Those are the reasons why we filed it for
2 notification purposes but are not using it as an exhibit
3 or as evidence.

4 MR. RAWSON: Judge Smith, if I might just add
5 from the Staff's point of view, as Mr. Gallo stated, and I
6 agree with Mr. Gallo in this regard, the PRA specific to
7 the Byron plant was not requested nor required by the
8 Staff

9 The status of the document which has been tendered
10 in the course of discovery in this proceeding is unclear
11 at this point in terms of the regulatory framework but the
12 Staff has not utilized it in connection with this case.

13 JUDGE COLE: Was this document forwarded to the
14 Staff at the same time it was forwarded to the Board for
15 identification?

16 MR. GALLO: All parties received a copy at the
17 same time.

18 JUDGE COLE: At the same time?

19 MR. GALLO: Yes, at the same time.

20 MR. RAWSON: If I might add, Judge Cole, just so
21 we are not misunderstanding each other, the document was
22 given to the Staff as was done with everything else as a
23 matter of information under the appropriate obligations;
24 but it has not been submitted to the Staff with a request
25 for a Staff review or for anything of that nature.

1 JUDGE COLE: Thank you.

2 MR. GALLO: If I may add one further thought,
3 Judge Smith, the utility, Commonwealth Edison, believed it
4 was appropriate for their own purposes to conduct this
5 assessment.

6 I think it was highly appropriate for them to make
7 the business decision that they do it; but having
8 performed the study, we, as counsel, were confronted with
9 what do we do with it now.

10 Obviously, it was inappropriate to simply -- since
11 we were not using going to use the document primarily, it
12 was inappropriate to conceal it from the Board and the
13 parties and that's why, pursuant to McGuire, we filed it
14 with the parties and the Board the way we did.

15 JUDGE SMITH: You have a litigation choice of
16 either taking a position that the PRA is not required or
17 needed or defending a PRA that you did not elect to
18 defend.

19 MR. GALLO: That is correct.

20 JUDGE SMITH: Okay. That is fine.

21 MR. THOMAS: Judge, as I indicate, I have no
22 further questions for the witnesses at this point.

23 JUDGE SMITH: You have completed?

24 MR. THOMAS: Yes.

25 JUDGE SMITH: And Mr. Campbell has none; right?

1 MR. CAMPBELL: I have a few. In fact, your
2 Honor, giving an oral outline, I would just touch upon the --

3 JUDGE SMITH: What happened to our arrangement
4 agreed upon yesterday that you would feed your questions
5 now that you know through Mr. Thomas?

6 MR. CAMPBELL: I didn't realize that there was
7 such an arrangement.

8 JUDGE SMITH: Are you representing to the Board
9 that you did not understand our discussion that hereafter
10 you will make a best effort to feed questions through a
11 single representative on the joint issue?

12 MR. CAMPBELL: I understood it as on this
13 contention it was acceptable but the other contentions it
14 was not. That was my understanding of it. I am sorry for
15 my --

16 JUDGE SMITH: Now, let us understand that from
17 this moment on, it somewhat applied yesterday on Recross
18 when Mr. Thomas had another go-around on your cross.

19 From this moment on counsel is expected to work
20 together, the parties are expected to work together, to
21 make a best effort to consolidate the cross examination.

22 If your best effort fails and you represent that's
23 the case to the Board, then we will address it as it comes
24 up.

25 Now, so we will permit you to cross examine on the

1 same basis that we did yesterday. There is, however,
2 another matter that the Board wishes to bring to your
3 attention; and that is on the evening television news last
4 night we were treated to your views on some of the matters
5 which are very closely related to the issues being tried
6 here, and the interview took place in this very courtroom.

7 Now, yesterday Judge Roszkowski lifted the local
8 rule which prohibits cameras above the second floor in
9 this courthouse and for the NRC hearing alone has
10 permitted, as the parties may have noticed, television
11 cameras in the room, consistent with NRC policy, which
12 does permit cameras; but I do not think that Judge
13 Roszkowski intended to have his courtroom used as a press
14 conference.

15 There is another aspect. Traditionally, parties are
16 not expected to go to the media and address the issues
17 being litigated during a litigation.

18 Now, this is a marginal situation, because you also
19 have general views, which are not being litigated, but it
20 was presented in the context of the litigation; and, as a
21 consequence, the Board in the absence of any other party,
22 saw your views, you telling us, the TV audience, how you
23 felt about the Sandia printout and that type of thing.

24 So I suggest that, perhaps, in the future, one, I
25 will admonish any TV people not to conduct interviews

1 here; and, two, you might consult with counsel as to what
2 is proper and what is not proper by way of bringing your
3 view of the issues being litigated to the media outside
4 the hearing room.

5 I might say that the Board will disregard the views
6 that Mr. Campbell expressed about the Sandia printout on
7 the TV channel.

8 MR. THOMAS: I take it -- even though I am not
9 directly involved -- I take it they would disregard the
10 views of Mr. Levine as expressed in the television --

11 JUDGE SMITH: I didn't see Mr. Levine's views.
12 However, I would think that that also would apply, that if
13 you are going to litigate matters, there is a tradeoff.
14 When you become a party, then you give up some of your
15 freedom of expression opportunity. It is traditional. I
16 don't know if we can enforce it, but I think we should
17 understand what the rules are going to be.

18 I don't believe that anyone would be in here in a
19 litigation presided over by Judge Roszkowski and run out
20 during the recess and tell the television camera what
21 their view of the issues being litigated in the
22 courtrooms are. Litigants of our proceedings are expected
23 under 2.713 to comport themselves as if they were in the
24 United States District Court.

25 MR. THOMAS: I understand that, Judge. I

1 believe Mr. Campbell understands that, too.

2 Well, I think the Board has expressed its views and
3 I think those views are appropriate and I think that it
4 applies to all parties to this proceeding.

5 JUDGE SMITH: Now, item per the remarks with the
6 observation that our hearings are roughly conducted as if
7 we were the United States District Court without an jury,
8 so the harm is not -- the potential harm is not especially
9 great, because we are perfectly capable of disregarding
10 that information, yet it does fly in the face of a very
11 firm tradition and almost a courtesy, I guess, is to keep
12 your litigation in the hearing room.

13 Why don't we take a mid-morning break? Counsel, as
14 we indicated earlier when there is question about what a
15 witness or a panel of witnesses may have said the previous
16 day, we expect counsel to take advantage of the Board's
17 copy of the transcript to -- rather than wasting hearing
18 time speculating, so if you would like to borrow our copy
19 of yesterday's transcript during the recess, if you have
20 any doubt about yesterday's testimony, you are welcome to.

21 MR. THOMAS: All right. Maybe we can go off the
22 record?

23 JUDGE SMITH: That was Friday, that was
24 Thursday?

25 MR. THOMAS: Wednesday or Thursday.

1 JUDGE SMITH: We will find it and bring out the
2 transcripts on Dr. Morgan's testimony.

3 MR. THOMAS: Okay. Thank you.

4 JUDGE SMITH: Does any party care to comment
5 about the Board's observation about discussing the issues
6 with the media outside the hearing room? Does anybody
7 object to the observations we made?

8 MR. THOMAS: I don't object to the observations.
9 I really don't want to get involved in it, because it was
10 not -- you know, we weren't involved in it.

11 JUDGE SMITH: I understand.

12 MR. THOMAS: But I would -- I don't know what
13 the impetus was for the TV cameras showing up here. I
14 don't know how they got here, but they came, as I
15 understand it, they interviewed Mr. Levine, I saw him on,
16 you know, and then I didn't even know that they had
17 interviewed Mr. Campbell, as a matter of fact, until
18 later. I was told that that took place outside.

19 JUDGE SMITH: Well, the remarks are prospective.
20 I am concerned about --

21 MR. THOMAS: Okay.

22 JUDGE SMITH: No harm has been done. I am just
23 concerned about the future and I am also concerned that we
24 conduct a hearing with traditional decorum and that, I
25 believe, is inconsistent with traditional decorum.

1 MR. RAWSON: Judge, let me make one observation,
2 not to belabor it.

3 The Judge did, at the outset of the hearing,
4 instruct the parties about what kind of press decorum and
5 restraint was expected, and I am not going to characterize
6 the statements presented by either Mr. Campbell or Mr.
7 Levine yesterday, but I think one can draw a distinction,
8 if they wish, between a party litigant characterizing
9 testimony or representing a point of view and a witness
10 being asked to state what he testified to.

11 JUDGE SMITH: Yes, I believe so, yes.

12 AS I say, this is a soft area. It's one that we
13 could not enforce, anyway, because we certainly can't
14 monitor the media and have no intention to.

15 I am just reminding the parties that there is a
16 tradition and the 2.714 requires that the same traditions
17 that prevail in the United States District Court prevail
18 here -- 2.713.

19 Mr. Gallo.

20 MR. GALLO: I have nothing to comment other than
21 to indicate that we certainly take no exception to your
22 characterization of the proper conduct in this proceeding
23 with respect to interviews.

24 MR. GOLDEN: We will also observe that
25 tradition, too.

1 JUDGE SMITH: All right. Then let's take a
2 mid-morning recess of ten minutes, please.

3 (Recess.)

4 JUDGE SMITH: Are you ready, Mr. Campbell?

5 MR. CAMPBELL: Yes.

6 As an oral outline, I will be beginning with the
7 risks associated with numerous reactors in certain
8 geological area, touching upon the precursor study and the
9 INPO Study referred to by Mr. Levine, then ending with
10 just two questions on the probability of another
11 degraded core-type accident.

12 I am not sure exactly who to direct the questions
13 to; but I should just toss them up, toss-up question?

14 JUDGE SMITH: Traditionally, the panel selects a
15 question director, and I don't know if you have done it in
16 this instance, but I recommend that you do, that somebody
17 organizes it.

18 MR. CAMPBELL: I can just direct the question to
19 the panel.

20 (WITNESS HULMAN): I will try and direct a
21 response, either I will or try to see if there is somebody
22 that can take the response that is thoroughly familiar
23 with the question area.

24 CROSS-EXAMINATION ON BEHALF
25 OF INTERVENOR DAARE/SAFE

1 BY MR. CAMPBELL:

2 Q My first question is: Have there been any studies
3 relating to the risk associated with placing numerous
4 reactors within a certain geographic area?

5 A (WITNESS HULMAN) Yes.

6 Q Could you name them?

7 A (WITNESS HULMAN) There have been a number of studies.
8 Let's see if I can recall.

9 A number of years ago -- I would say within the last
10 seven years -- there was a study of regional generating
11 centers in which multiple reactors at a single site were
12 considered.

13 As far back as prior to 1962, in -- the development
14 of 10 CFR Part 100 safety considerations included
15 consideration of multiple reactors at a single site. In
16 fact, Part 100 today includes such references.

17 In addition to that, there have been contentions --
18 at least one other case that I am familiar with -- that
19 relate to the accident risks from multiple sites.

20 Q Is that all?

21 A (WITNESS HULMAN) I can't name the specific documents.

22 Q No. I wasn't asking that; just that there were other
23 studies.

24 A (WITNESS HULMAN) There were other studies.

25 Those studies that I have alluded to are generally

1 the kinds of studies.

2 Q Is there anyone else on the panel that might be able to?

3 A (WITNESS BRANAGAN) I think one of the documents you refer
4 to is the Energy Power Siting Study.

5 Q I am sorry. What was that?

6 A (WITNESS BRANAGAN) One of the documents Jerry referred to
7 was the Energy Power Survey Study.

8 Q The Energy Power Survey?

9 A (WITNESS HULMAN) The regional power centers.

10 Q Again, that is a study relating to primarily placing a
11 number of reactors on a specific site in a very close area
12 of proximity?

13 A (WITNESS BRANAGAN) That is correct, that is correct.

14 Q There have been no studies, then, concerned with a larger
15 geographical area, such as Northern Illinois, Southern
16 Wisconsin?

17 A (WITNESS HULMAN) I believe that in the regional power
18 study, Regional Power Siting Study, Northern Illinois, and
19 the number of reactors located in Northern Illinois was
20 one of the considerations.

21 So were the considerations of a number of reactors
22 located in Pennsylvania, New Jersey and Maryland and
23 Northern Virginia.

24 I think you would find that there are more reactors
25 in that part of the country than there are in Northern

1 Illinois.

2 JUDGE SMITH: How about the Hanford site; were
3 there any studies made?

4 (WITNESS HULMAN): Hanford was one of the main
5 regions for a regional power center. That was another
6 area.

7 There was one in the Southwestern United States,
8 there was one in the Southeastern United States. Hanford
9 was one, also.

10 A (WITNESS BRANAGAN) I might add that one other study was
11 done in regard to multiple units at a site in compliance
12 with 40 CFR 190, EPA's fuel cycle regulations.

13 BY MR. CAMPBELL:

14 Q Was there ever set an upper limit to the number of
15 reactors that should be placed at a specific site?

16 A (WITNESS HULMAN) No.

17 Q Was it just never considered because the chances of an
18 accident were so remote or was it just never considered
19 because nobody wanted to consider it or --

20 A (WITNESS HULMAN) No. The number of reactors at a
21 specific site was a consideration in our safety regulation
22 and has been a Staff consideration and continues to be a
23 Staff consideration; but the Staff judgment is that within
24 the number of reactors at a specific site that we have
25 seen, multiple reactor siting is not considered a safety

1 concern within our regulations and practice.

2 Q Would you have an opinion as to why it is not considered?

3 A (WITNESS HULMAN) Yes.

4 Q Would you venture that opinion?

5 A (WITNESS HULMAN) The judgment -- as I understand it, the
6 collective Staff judgment has been that our deterministic
7 criteria that we use to license a plant provides adequate
8 protection for the occurrence of a single event at a
9 multiple reactor site.

10 Q When was that judgment made; before or after Three Mile
11 Island?

12 A (WITNESS HULMAN) I believe that the judgment was
13 originally made as part of the considerations for 10 CFR
14 Part 100; was confirmed several times prior to TMI,
15 because we had received applications for three and four
16 unit sites, which we had not previously seen; and after
17 TMI we have continued to confirm, on several occasions,
18 that our practice in the area is adequate.

19 Q Do you know how many reactors are being planned for
20 Northern Illinois by Commonwealth Edison?

21 A (WITNESS HULMAN) No.

22 Q Could it be possible that it might have been listed in the
23 FES somewhere how many reactors are --

24 A (WITNESS HULMAN) I doubt seriously in my reading of the
25 FES -- and I have read it on several occasions -- my

1 recollection is there is no information in that FES on
2 Commonwealth's plans.

3 JUDGE SMITH: Let's assume for the purpose of
4 analyzing your line of questioning that Commonwealth
5 Edison does have a lot of plans for a lot of future sites
6 in Northern Illinois.

7 Where would the consequences of that be litigated;
8 in this proceeding or in future proceedings?

9 MR. CAMPBELL: I believe the contention that we
10 have raised and that we have supported through summary
11 disposition is one of the fact that we are being faced
12 with an unfair burden of risk in Northern Illinois because
13 of the number of reactors.

14 JUDGE SMITH: But by the express language of
15 your contention --

16 MR. CAMPBELL: I would also suggest also because
17 of the planned reactors, too, the number of reactors that
18 are planned to be operated by the utility within the next
19 few years, in fact.

20 JUDGE SMITH: Well, my observation was that,
21 perhaps, the time to litigate the cumulative effects of
22 future reactors would be during the licensing phase of
23 those future reactors and not during the licensing phase
24 of this reactor.

25 I am asking for comments on it if you are going to

1 go into that area very long.

2 MR. CAMPBELL: No, your Honor.

3 Again, I was just wondering if the NRC Staff was
4 aware of other reactors that Commonwealth Edison were
5 building or planning to build in the Northern Illinois
6 area.

7 (WITNESS HULMAN): Is that a question?

8 BY MR. CAMPBELL:

9 Q Again, you are not aware of the two plans -- two plants at
10 Braidwood?

11 A (WITNESS HULMAN) I am aware of the two units under
12 construction at Braidwood; but your question did not
13 identify only Braidwood. Your question was a general
14 question.

15 I don't know what plans Commonwealth has beyond
16 Braidwood.

17 Q Perhaps the Carroll County -- the chance of a Carroll
18 County reactor site -- is there any awareness on the
19 Staff's part about the two plants planned for Carroll
20 County?

21 A (WITNESS HULMAN) I don't know what the status of the
22 Carroll County units are; but we do not as a rule judge
23 the safety of one unit and the license to operate one unit
24 on the remote possibility that the same utility may plan
25 or build other units in the future at some other site or

1 even at that site.

2 Q Do you feel --

3 A (WITNESS HULMAN) We are only looking at the application
4 in front of us.

5 Q Do you feel that, with every reactor that goes on line, it
6 is an increase in risk to the residents of the area?

7 A (WITNESS HULMAN) Yes, but a small one; and that's what
8 our FES describes, relatively small accident risks and
9 relatively small risks from normal operation.

10 Q Is there ever a time when the number of reactors could
11 make that risk too great?

12 A (WITNESS HULMAN) It's conceivable.

13 Q Is there a set number of reactors that the NRC has
14 conceived of to reach that point?

15 A (WITNESS HULMAN) No.

16 Q Would you say 10 reactors within an area?

17 MR. RAWSON: Objection, Judge. The witness has
18 given his answer.

19 BY MR. CAMPBELL:

20 Q A ballpark figure, even though I was hoping for --

21 MR. RAWSON: My objection stands, Judge.

22 JUDGE SMITH: Well, he said he didn't know and
23 he suggested 10.

24 Does that refresh your memory?

25 (WITNESS HULMAN): No.

1 JUDGE SMITH: Okay. That is enough.

2 BY MR. CAMPBELL:

3 Q So the NRC -- is it true that the NRC has not set a limit
4 to the amount of risk that a utility can inflict upon the
5 residents of a certain area?

6 MR. RAWSON: I will object to the form of the
7 question.

8 The word "inflict," I think, is unnecessarily
9 inflammatory.

10 MR. CAMPBELL: That's true, your Honor.

11 BY MR. CAMPBELL:

12 Q Is there a limit to the amount of risk that a utility can
13 present to the residents of an area?

14 A (WITNESS HULMAN) Today there is no regulatory limit,
15 other than the proposed safety goals, which the Commission
16 has not made mandatory on the part of either industry or
17 the Staff.

18 Those proposed safety goals, if every issued for
19 actual implementation, would provide the basis for --
20 could provide the basis for limiting the risk from
21 multiple reactors.

22 Q Thank you. That is helpful.

23 Does the proposed safety rules take into
24 consideration the risk, and if it does, does it indicate a
25 number of reactors or some certain number of risk, the

1 amount of risk that an area could --

2 A (WITNESS HULMAN) Proposed safety goals are presently
3 structured to identify three considerations.

4 Those three considerations are the probability of
5 core melt, the risk -- average annual risk of early
6 fatality, as I remember, and the annual average risk of
7 latent cancer fatality.

8 They may, in their final form, be useful for
9 indicating the risks from multiple reactors.

10 In their present form, they are useful only on an
11 incremental per reactor basis as a practical matter.

12 As a theoretical matter, they are also useful for
13 limiting multiple reactors.

14 Q How would one theoretically use the safety goals to
15 attempt to limit the number of reactors within the given
16 area?

17 MR. RAWSON: Judge Smith, we are into an area
18 here where the witness has testified that these are
19 proposed safety goals. They are not currently operative.

20 I see no relevance to further exploration of this
21 issue.

22 The witness has answered Mr. Campbell's questions
23 insofar as they might have some conceivable impact on this
24 contention.

25 It seems to me we are going quite far afield.

1 JUDGE SMITH: The Board is split.

2 In that case, we will allow a certain amount of
3 additional information on the proposed safety goals.

4 Why don't you explain -- maybe we can shortcut the
5 process -- explain how the safety goals work from the
6 community out rather than the reactor in, you know, that
7 the risk from societal and individual is at stake rather
8 than the -- well --

9 (WITNESS HULMAN): Do you want me to try and
10 explain?

11 JUDGE SMITH: Yes. I am sure you will do a
12 better job than I am doing.

13 A (WITNESS HULMAN) As presently constituted, the proposed
14 safety goals address the probability of core melt, they
15 address individual risk and they address societal risk.

16 The individual risk is generally stated as --
17 one-hundredth of one percent, I think the numerical value
18 is, of risks from other kinds of accidents to an
19 individual one mile from a reactor.

20 The societal risks, as presently being interpreted,
21 are the average risks to people within 50 miles of a
22 reactor.

23 The intent of the safety goals, as I understand it,
24 is to address the question of "How safe is safe enough?"

25 Not so much to address the question of risk, but to

1 try and put a limit on the question, that has been very
2 difficult to answer for a number of years, "How safe is
3 safe enough in the design and citing of a reactor" --
4 "design, siting and operation of a reactor?"

5 BY MR. CAMPBELL:

6 Q I am afraid the shortcut kind of took us around.

7 I was asking more along the lines, from an
8 intervenor's prospective, how could these proposed safety
9 goals theoretically be utilized to maintain, you know, a
10 lower level of the number of reactors within a given area.

11 A (WITNESS HULMAN) I think I would only speculate, and I
12 think that how they may help an intervenor should be up to
13 the intervenor to determine.

14 Q Okay. Very good.

15 JUDGE SMITH: If there is a societal risk limit
16 within a given area from reactors, then would that not
17 necessarily, perhaps, have the effect of limiting the
18 number of reactors in a given area?

19 I think that is the -- how that could possibly have
20 that effect. I think that's the reasoning behind it.

21 MR. CAMPBELL: Yes.

22 BY MR. CAMPBELL:

23 Q Is that what the NRC was suggesting?

24 A (WITNESS HULMAN) That's one interpretation, but one must
25 set the number low enough to be effective.

1 If one sets the number high, the allowable risk
2 high, or if the true risk is, indeed, a low number, then
3 the number of reactors that one sites in a particular
4 region of the country is immaterial if either the limit is
5 high or the true risk is low.

6 Q Again, who sets these limits?

7 A The Commission has proposed safety goals.

8 Q So it is the NRC Commissioners that would be setting the
9 limit with -- after hearings, et cetera?

10 MR. GALLO: Objection. This line has continued
11 for some time, and it's all immaterial, and I object to
12 further questioning along those lines.

13 To advance the information of Mr. Campbell, I am
14 going to grace him with a copy of the proposed safety
15 goals.

16 MR. CAMPBELL: I believe I already have a copy,
17 but I will take an extra one because of the Xerox costs.

18 MR. GALLO: I object on materiality grounds.

19 JUDGE SMITH: In any event, the proposed safety
20 goals are just that. They are still in the early stages;
21 and I do believe we have exhausted any benefit from
22 exploring that any further.

23 MR. CAMPBELL: Yes, I agree, your Honor.

24 JUDGE SMITH: Objection sustained in that event.

25 BY MR. CAMPBELL:

1 Q Are you familiar with the precursor accidents that have
2 occurred at Commonwealth Edison's other plants, Mr.
3 Newberry?

4 A (WITNESS NEWBERRY) No, I am not. I have not gone through
5 the events in the study to see which plants they have
6 occurred at. I have not gone through the study event by
7 event.

8 Q Is there any maybe overall knowledge that some events have
9 occurred at Commonwealth Edison's other plants besides
10 Byron?

11 A (WITNESS NEWBERRY) I can't say. I haven't looked at them
12 event by event.

13 Q Is there a way of adding to the number of precursors that
14 have occurred after 1979? Are they continuing that
15 accumulation of data?

16 A (WITNESS NEWBERRY) Yes, that's exactly what they are
17 doing.

18 There will be a report coming out some time -- I am
19 not real sure of the schedule, but it shouldn't be too
20 much longer -- to continue with the 1980, 1981 data,
21 something similar to what was done here, and, perhaps,
22 look at the trend, if you will.

23 MR. THOMAS: Excuse me a moment, your Honor,
24 while we are discussing something.

25 BY MR. CAMPBELL:

1 Q Mr. Newberry, I have -- let me tender to you a list of
2 what we feel is -- let me tender to you a list of
3 precursor events from Commonwealth Edison's plants you
4 used in the precursor study for your review.

5 (Indicating.)

6 MR. RAWSON: Judge Smith, may we first know the
7 source of this document and counsel have a chance to look
8 at it?

9 JUDGE SMITH: Certainly.

10 MR. CAMPBELL: This document is --

11 JUDGE SMITH: Let Mr. Gallo have an opportunity,
12 too.

13 MR. CAMPBELL: All right.

14 JUDGE SMITH: Are you ready?

15 MR. RAWSON: Judge Smith, I would like to ask
16 that we have the document, at least in terms of its nature
17 and source, identified for the record, if there are going
18 to be questions of these witnesses on it.

19 I don't know at this point if the questions will be
20 objectionable.

21 JUDGE SMITH: Well, who is best able to identify
22 the document? Who has it now?

23 MR. CAMPBELL: I can identify it.

24 It is a list drawn up by Kay Twigg, a member of a
25 Palatine environmentalist group. She read the precursor

1 study, and those are the number of accidents that she was
2 able to determine were precursors that occurred at
3 Commonwealth Edison's plants, and I was going to then ask
4 some questions based upon that list.

5 MR. GALLO: Judge Smith, may I be heard?

6 JUDGE SMITH: Yes.

7 MR. GALLO: I am afraid I would have to object
8 on behalf of my client to any questioning based on that
9 compilation of precursor events on the grounds that there
10 is no foundation to establish the authenticity of the
11 list.

12 The best evidence of the number of precursor events
13 that happened at Commonwealth Edison plants are contained
14 in the report itself.

15 By the admission of Mr. Campbell this was,
16 apparently, a compilation drawn by an individual, who, I
17 assume, is a lay person and not an engineer familiar with
18 that sort of thing.

19 Therefore, that raises into question the accuracy
20 and authenticity of the compilation.

21 I am going to have to object to any questions on
22 that basis.

23 MR. RAWSON: Judge Smith, I was going to wait
24 for the first question, but I expect to have very similar
25 objections.

1 JUDGE SMITH: There is one possibility, however,
2 and that -- do you wish to be heard?

3 MR. CAMPBELL: I will listen to what you have to
4 say, your Honor.

5 JUDGE SMITH: There is a possibility -- the
6 objections are well made.

7 There is, however, the possibility that -- the list
8 is prepared by someone who, I concede, is not here
9 available for cross examination, so there is no way that
10 we can determine that that is a reliable list.

11 However, if the list can independently refresh the
12 memories of the panel members and they can attest to its
13 accuracy or something, that would be a permissible way to
14 go in the direction you are trying to go; but you are
15 going to have to establish that first.

16 Do you understand the distinction?

17 MR. CAMPBELL: Yes.

18 JUDGE SMITH: Mr. Thomas, you can assist, if you
19 wish.

20 MR. THOMAS: That is what I was going to do. I
21 was going to give him the foundation questions.

22 MR. GALLO: Judge Smith, Applicant has no
23 objection to Mr. Thomas asking the foundation questions.

24 JUDGE SMITH: Mr. Thomas, any way that you want
25 to enter and leave this aspect of it, it might be helpful.

1 (Laughter.)

2 MR. THOMAS: All right. Maybe with permission --
3 just a minute.

4 BY MR. THOMAS:

5 Q Mr. Newberry, you have indicated a familiarity with the
6 precursor study; is that correct?

7 A (WITNESS NEWBERRY) Yes, that is correct.

8 Q And does a portion of that precursor study deal with
9 precursor accidents at various Commonwealth Edison nuclear
10 power stations?

11 A (WITNESS NEWBERRY) They are not called precursor
12 accidents. They are called precursors.

13 Q All right, precursors then.

14 You recognize that as a subject of the precursor
15 study, don't you?

16 A (WITNESS NEWBERRY) I know there are a list of precursors
17 in the study. However, I have not gone through that list
18 to see what --

19 Q Well, I will arrive at that stage.

20 A (WITNESS NEWBERRY) Fine.

21 Q You have reviewed the list of precursors in the precursor
22 study; is that correct?

23 A (WITNESS NEWBERRY) No, sir, I have not reviewed the
24 entire list of precursors in the study.

25 I have looked at some of the specific ones which

1 dominated the results of the study.

2 Q By that you are referring to TMI again and Rancho Seco and
3 Browns Ferry, among others?

4 A (WITNESS NEWBERRY) Yes, sir.

5 Q Okay. Now, do you remember the list of precursors
6 contained in the precursor study regarding accidents at
7 Commonwealth Edison?

8 JUDGE SMITH: Regarding precursors at
9 Commonwealth Edison?

10 MR. THOMAS: Yes, precursors at Commonwealth
11 Edison stations.

12 A (WITNESS NEWBERRY) No, I do not.

13 BY MR. THOMAS:

14 Q Does the document in front of you refresh your memory
15 regarding the subject of precursors at Commonwealth Edison
16 stations?

17 A (WITNESS NEWBERRY) No, because I did not go through the
18 list to see which plants precursors occurred at.

19 JUDGE SMITH: Can any other panel member --
20 would any other panel member testify differently than Mr.
21 Newberry?

22 (WITNESS BRANAGAN): No.

23 A (Continuing.) (WITNESS NEWBERRY: I, perhaps, have one
24 comment.

25 The list jogs my memory in respect to some of these

1 events, not in the precursor study.

2 I don't know whether you want me to give that answer
3 or not.

4 BY MR. CAMPBELL:

5 Q Are there certain events on that list that does jog your
6 memory that could be events in the precursor study?

7 A No, I can't answer that.

8 MR. THOMAS: Can I have a minute to see what the
9 ultimate objective is here?

10 Judge, I don't think that Mr. Campbell is going to
11 be able to reach his objectives through the use of the
12 document, because, really, he is trying to refresh
13 recollection for something that the witness has really
14 indicated he doesn't have any recollection of.

15 JUDGE SMITH: This might be an appropriate time
16 to remind the intervening parties, particularly, that in
17 our order of January 14th, which is the memorandum and
18 order, anticipation of evidentiary hearing, there was a
19 section in there which warned the parties about their
20 cross examination plans; and the final aspect of it was,
21 quote, "Parties might consider early service of their
22 cross examination plans upon the party sponsoring the
23 respective witness to better assure that the witness is
24 prepared to address the matters upon which he will be
25 examined."

1 You see, there is a tradeoff. If you keep your
2 cross examination secret, then you cannot really expect as
3 much preparation by the witnesses; but if you inform them
4 far in advance, the study, perhaps, could have been here
5 and you would have gone directly to your point and it
6 would have been a clear, more efficient record.

7 MR. CAMPBELL: May I retrieve this document?

8 JUDGE SMITH: That does not mean that you can
9 unload a cross examination plan upon a panel and have them
10 bring bushels of documents, because that should have been
11 taken care of during discovery.

12 MR. CAMPBELL: May I retrieve my document?

13 JUDGE SMITH: Yes.

14 BY MR. CAMPBELL:

15 Q Is anyone on the panel familiar with the INPO Study
16 referred to by the Applicant's witness?

17 (WITNESS HULMAN): Do you want to take that?

18 A (WITNESS NEWBERRY) I know INPO did a study. I have not
19 seen it.

20 I did get a chance to look briefly through the
21 transcript of a recent ACRS meeting where INPO
22 representatives talked about the results of their study.

23 BY MR. CAMPBELL:

24 Q In reviewing the ACRS -- could you repeat, the ACRS what?

25 A (WITNESS NEWBERRY) The ACRS transcript.

1 Q In reviewing the ACRS transcript, was there any criticisms
2 of INPO that you were able to glean from the study --

3 MR. RAWSON: Objection, Judge -- I am sorry.

4 Mr. Campbell, had you completed your question?

5 BY MR. CAMPBELL:

6 Q -- that you were able to glean from the transcript?

7 MR. RAWSON: Objection.

8 I would like to know criticisms by whom; and I may
9 have a further objection, depending upon the nature of the
10 answer, which goes to the process of the ACRS and the ACRS
11 proceedings.

12 But I think the appropriate objection to form is
13 criticisms by whom.

14 JUDGE SMITH: Also, my memory of the question is
15 you better clarify criticisms of whom, too.

16 Who is being criticized?

17 MR. CAMPBELL: The INPO Study was what I was
18 referring to.

19 BY MR. CAMPBELL:

20 Q I was referring to: Were there any general criticisms of
21 the INPO Study by the ACRS --

22 MR. RAWSON: Objection, Judge.

23 BY MR. CAMPBELL:

24 Q -- or by other participants?

25 MR. RAWSON: It seems to me the question is

1 objectionable with respect to any criticisms by ACRS
2 members.

3 The ACRS meetings in this area and in other areas as
4 well are exploratory meetings for the purposes of review.

5 They do not -- when an ACRS member criticizes or
6 appears to criticize a particular piece of judgment, that
7 is not a judgment by the ACRS and may not even be a
8 judgment by that particular member in question.

9 For that reason the ACRS letters are not subjects to
10 be delved into in hearings.

11 It seems to me comments by ACRS members as opposed
12 to comments by Staff or INPO members at ACRS are not
13 subjects -- or fit subjects of inquiry in our proceedings.

14 There may be other ways to get at it. I don't mean
15 to be obfuscatory here.

16 If there are particular criticisms that Mr. Campbell
17 wishes to put to the witness as a hypothetical or as is
18 one proper criticism of the report thus and such, I think
19 that may be appropriate, but I don't want to be bestowing
20 the mantle of the ACRS on alleged criticisms.

21 JUDGE SMITH: The objection could lead us in
22 many directions, including a discussion of the hearsay
23 rule, and when hearsay is, nevertheless reliable, and what
24 you should have done on discovery and the scope of the
25 direct and how it relates to your contention. It's a big

1 problem.

2 I think Mr. Rawson's observations are correct. If
3 an individual ACRS member, in the course of his hearings
4 or whatever it is that they do, might express off-the-cuff
5 criticism, that would be virtually valueless. That would
6 not be the essential guarantee of reliability that we need
7 to put aside the bias against hearsay evidence in
8 hearings.

9 You can bring in hearsay evidence, providing it has
10 essential guarantees of reliability.

11 In the situation that you are approaching, I don't
12 see where those guarantees of reliability would be
13 present, if that's what you are looking for.

14 If you are looking for off-hand comments of
15 individual ACRS members, I don't think that it would be --

16 MR. CAMPBELL: No.

17 JUDGE SMITH: You are talking about official
18 ACRS expressed criticisms?

19 MR. CAMPBELL: Yes.

20 Wouldn't the transcript of the session which just
21 took place March 9, 1983 --

22 JUDGE SMITH: In the transcript -- I doubt if
23 you are going to find the ACRS members speaking in unison,
24 officially, in any transcript.

25 MR. CAMPBELL: Yes. I was meaning the

1 individual participants of the ACRS.

2 JUDGE SMITH: I beg your pardon?

3 MR. CAMPBELL: I was speaking of the individual
4 participants of the ACRS.

5 JUDGE SMITH: Exactly; and that's the weakness
6 in your approach, because they certainly are not witnesses
7 here nor did they purport to be witnesses there nor did
8 they purport to be doing anything except trying to
9 stimulate information so they could make their judgment.

10 The guarantees of reliability sufficient to overcome
11 the hearsay rule are not present because of the
12 circumstances under which those comments could be made.

13 It could very well be that an ACRS member, just as a
14 Board member, might be using the mode of criticism as the
15 Devil's advocate to develop information.

16 It does not have the guarantees of reliability, the
17 assurances of reliability, that we need.

18 MR. CAMPBELL: I was -- I was -- since this is
19 the first time that the ACRS transcript has come up in
20 relation to the INPO Study, I was hoping to find out if
21 there was any information that would be pertinent to this
22 case.

23 JUDGE SMITH: And you don't know.

24 I think you are admitting that you are fishing,
25 aren't you?

1 MR. CAMPBELL: Yes.

2 JUDGE SMITH: This could have been explored on
3 discovery.

4 Do you have specific information?

5 You don't know -- you don't even know where you are
6 going? You are fishing? You don't have any specific
7 criticism that you know about, do you?

8 MR. CAMPBELL: I do have specify criticism by
9 the ACRS.

10 JUDGE SMITH: By the ACRS individual members?

11 MR. CAMPBELL: Yes.

12 JUDGE SMITH: You are going to have relief -- if
13 we sustain the objection, you will be allowed to proffer
14 the information that you believe would be produced by
15 these witnesses for review on appeal; and it may very well
16 be, when you proffer it, you might move for
17 reconsideration -- I don't know -- but until the vacuum
18 that we have now -- why don't you just go directly to what
19 you are trying to prove. Just get the essence of the
20 information and tell us what it is as a proffer -- as an
21 offer of proof of what you would prove by this line of
22 questioning.

23 MR. CAMPBELL: I was wondering whether the INPO
24 study was criticized because it had no statistician.

25 JUDGE SMITH: Who said that, who criticized it,

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what is the basis for your question?

Get to your point directly.

MR. CAMPBELL: I cannot put my finger on the --
in the transcript, but there was criticism that there was
no statistician of --

JUDGE SMITH: By an individual member of the
ACRS?

MR. THOMAS: Judge, I think we can reach the
subject matter in a permissible way, without getting into
asking it in that form.

JUDGE SMITH: Do you want to try?

BY MR. CAMPBELL:

Q Wasn't the INPO Study criticized --

MR. THOMAS: No.

MR. CAMPBELL: No?

MR. THOMAS: No.

MR. CAMPBELL: Excuse me.

BY MR. CAMPBELL:

Q Mr. Newberry, in your opinion, is the INPO Study deficient
because it did not have or elicit the services of a
statistician?

A (WITNESS NEWBERRY) I don't know the answer to that. That
may be a criticism but I don't know that I agree.

JUDGE SMITH: You don't know if you agree?

1 A (WITNESS NEWBERRY) No, I don't know that I agree it was
2 deficient because there was no statistician.

3 JUDGE SMITH: Let's break it down.

4 BOARD EXAMINATION

5 BY JUDGE SMITH

6 Q Do you agree there was no statistician?

7 A (WITNESS NEWBERRY) I believe I read that in the
8 transcript. I don't know it for a fact.

9 Q We have come full circle now.

10 You have no opinion one way or the other if there
11 were?

12 A (WITNESS NEWBERRY) That is correct, yes.

13 BY MR. CAMPBELL:

14 Q Mr. Newberry, do you believe that or would it be your
15 opinion that the INPO Study, after reviewing the precursor
16 study, took the high risk events in that study, in the
17 precursor study, and found ways to reduce them, to take
18 them out of the study deliberately? They were looking for
19 ways in the direction of reducing the risk?

20 A (WITNESS NEWBERRY) What is your question again?

21 Q Would it be your opinion that the INPO Study took high
22 risk events out of the precursor study, found ways to take
23 them out of the precursor study in ways of reducing the
24 overall risk that was found in the precursor study?

25 JUDGE SMITH: I think that's an ambiguous

1 question. The use of the words "take them out," suggests
2 that they considered them from the precursor study or
3 disregarded them. It could be interpreted either way.

4 I think that you intend to ask, if this witness has
5 knowledge whether the INPO Study deliberately eliminated
6 from its consideration high risk precursors.

7 Is that the thrust of your question?

8 MR. CAMPBELL: That would be half, part of it.
9 I would wonder if they know that they did -- whether they
10 did take the more risky studies out of the precursor study
11 and just had the INPO -- or at least -- isn't it true that
12 the INPO Study focused on the high risk events and found
13 ways to minimize them overall deliberately.

14 JUDGE SMITH: I don't understand why there is no
15 objection, but this witness can't possibly know what the
16 intentions of the INPO Study authors were.

17 However, there is no objection, then maybe you do
18 have some insight; but bear in mind that the question uses
19 the word "deliberately."

20 A (WITNESS NEWBERRY) I agree with the Judge's comments. I
21 am not -- I can't comment on the objectives of the INPO
22 review.

23 Many people have been reviewing this study, the
24 precursor study, quite critically.

25 It seems logical to me to begin with focusing on the

1 sequences that dominate the study.

2 BY MR. CAMPBELL:

3 Q Then maybe not deliberately, did they just have them in
4 the study, happen to overlook the more risky events?

5 MR. GALLO: I will object. Asked and answered.
6 He says he doesn't know.

7 JUDGE SMITH: No, I didn't hear him say that,
8 because I admonished him that it was a loaded question.

9 MR. GALLO: He says he doesn't know anything
10 about the details of the precursor study, so any line of
11 questioning about the details of the precursor study have
12 really been asked and answered on the basis he doesn't
13 know.

14 JUDGE SMITH: Well, that is overruled. He can
15 answer, if he knows.

16 A (WITNESS NEWBERRY) Could I get the question again,
17 please.

18 JUDGE SMITH: Please read it back.

19 (The question was thereupon read by the
20 Reporter.)

21 A (WITNESS NEWBERRY) I don't understand that question.

22 JUDGE SMITH: Do you know if the INPO Study
23 eliminated the more risky events from its consideration?

24 A (WITNESS NEWBERRY) It definitely considered the more
25 risky events, the precursors that dominated the result.

1 It didn't eliminate them.

2 BY MR. CAMPBELL:

3 Q In considering the risky events, the more risky events,
4 did it do anything special to them? How did they do them
5 in the study?

6 A (WITNESS NEWBERRY) I am not familiar with the detailed
7 considerations given by the INPO Study. I know in general
8 they attempted to understand in more detail the plant
9 specific aspects of the plant where the precursor
10 occurred.

11 And my understanding is that for the most part that
12 detailed understanding of the plant led to the comment
13 that the precursor study tended to overestimate the
14 frequency of severe core damage resulting from that
15 precursor.

16 Q How did they arrive at that conclusion?

17 A (WITNESS NEWBERRY) In a general sense, they arrived at
18 that conclusion by looking at the systems available at the
19 plant where the precursor occurred and re-assessing the
20 probability of severe core damage given the precursor; and
21 they found that the precursor report was deficient in its
22 event tree construction, that is, representing the systems
23 available at the specific plant; and because additional
24 systems were available or, perhaps, additional recovery
25 would have been reasonably expected by the operator, that

1 the frequency of severe core damage, given the precursor,
2 was judged to be lower.

3 Q Was there any attempt by the INPO people to do just the
4 opposite, look at other precursors that may have not been
5 taken into consideration by the precursor study?

6 A (WITNESS NEWBERRY) I don't know.

7 Q Mr. Newberry, generally speaking, isn't it correct that
8 the chance of a portion of a system failing is greater
9 than the probability that the entire system would fail?

10 A (WITNESS NEWBERRY) Generally speaking, I think that would
11 be correct.

12 Q Isn't it correct that both the precursor study and the
13 INPO Study focused on the probability of entire systems
14 failing and not specifically explore probabilities
15 associated with single component failures within the
16 system?

17 A (WITNESS NEWBERRY) That is correct.

18 Q Is it your opinion that the calculation of probabilities --
19 is it your opinion that the calculation of probabilities
20 associated with single component failures within a system
21 would have increased the probability results of both the
22 INPO and precursor studies?

23 A (WITNESS NEWBERRY) No, I don't know that I would agree
24 with that.

25 Q Would it be a possibility? Isn't it a possibility?

1 A (WITNESS NEWBERRY) Precursor -- the precursor study used
2 a screening criteria, as I understand it, to try to focus
3 on certain events and consider them as precursors to
4 factor into their methodology.

5 They considered -- the study considered -- many,
6 many LER's, the number over 19,000 comes to mind.

7 So they considered -- the study considered, you
8 know, in a sense, single failures. The precursors
9 themselves modeled in the study, I believe, you can read
10 the screening criteria in the study yourself to see
11 exactly what the definition of a precursor is. They
12 tended to be, I believe, multiple failures, system
13 failures, if you will.

14 Q Did it look --

15 A (WITNESS NEWBERRY) But --

16 Q I am sorry. Go on.

17 A (WITNESS NEWBERRY) I believe specifically you were asking
18 could the -- if one were to conclude single failures,
19 single-component failures in the precursor study, would it
20 increase the results.

21 I don't know. I don't think it would. My feeling
22 is that I don't think it would affect it significantly.

23 MR. CAMPBELL: One moment.

24 BY MR. CAMPBELL:

25 Q Isn't it true that neither the INPO Study nor the

1 precursor study would have considered the 35 incidences
2 since 1973 in which a circuit breaker failed in an
3 automatic safety system?

4 MR. RAWSON: I will object to the question,
5 Judge, for lack of foundation, unless Mr. Campbell wants
6 to state that as a hypothetical. We have had nothing in
7 the record to show in that --

8 MR. GALLO: I will object for another reason.
9 It's beyond the competence of the witness. I assume the
10 question is being addressed to Mr. Newberry. He has
11 already testified that he didn't look down the list of the
12 precursor events in the precursor study; and the question
13 is essentially addressing that kind of activity.

14 JUDGE SMITH: The question leaves open, however,
15 the possibility that there was a threshold intent to
16 eliminate that type of event or that there was a basis for
17 not including it independent of the actual list of
18 precursors.

19 If he knows. Do you know the answer to the
20 question?

21 A (WITNESS NEWBERRY) I don't know. I have an answer, yes,
22 sir, to the question.

23 My answer is based upon not a review of all the
24 precursors but an understanding of the criteria for what
25 sort of events would be called precursors.

1 JUDGE SMITH: All right. Mr. Gallo's objection
2 is overruled and your objection is also overruled, unless
3 it turns out, in fact, that the question has no basis in
4 the long run.

5 So you may answer.

6 A (WITNESS NEWBERRY) Yes, that point was discussed at the
7 ACRS meeting. I assume you are probably referring to the
8 transcript.

9 My understanding is that those sorts of events were
10 not considered precursors, that is individual breaker
11 failures are not -- would not be considered a precursor.
12 The system protective function would have been completed
13 satisfactorily if one breaker failed, the other would have
14 operated successfully.

15 BY MR. CAMPBELL:

16 Q So according to those two studies, INPO and precursor, it
17 is not considered -- they were not considered precursors
18 according to the INPO and precursor studies?

19 A (WITNESS NEWBERRY) That's my understanding.

20 Q But if they were considered, would that increase the
21 overall probability?

22 Does that mean that they could not be considered?

23 MR. RAWSON: I object to the form of the
24 question. I don't understand it at all.

25 MR. CAMPBELL: Strike that. I will strike that.

1 JUDGE SMITH: I want to approach it from a
2 slightly different angle, aside from the specific
3 objections -- to the specific objections, which we have
4 taken up as they have come, somebody will have to remind
5 how we got where we are so far into this witness'
6 understanding through a transcript of the ACRS, I guess,
7 of what the INPO Study is, how it relates to the direct
8 testimony and how it relates to his contention. I have
9 lost the thread of relevance now.

10 MR. CAMPBELL: I am sorry. The overall -- we
11 are trying to establish that the overall risk would have
12 been increased if they had taken some of the -- if they
13 would have increased the number of precursors, if they
14 would have taken a single failure component, if they would
15 have considered some of the other.

16 JUDGE SMITH: But your approach, look how far it
17 is removed from the actual events. Here is a witness'
18 recollection, unprepared for the testimony, of a
19 discussion by ACRS of a study.

20 I mean, this is thirdhand.

21 Generally speaking as to any one particular
22 question, or not, it may or may not be reliable; but the
23 general approach to you trying to get the INPO Study and
24 its deficiencies into evidence by thirdhand testimony is,
25 in the long run, deficient.

1 I suspect you were not prepared for this line of
2 questioning and I don't know what brought it up. What
3 brought it to your mind that you wanted to pursue it
4 through this witness? That's what I don't recall. I
5 don't recall anything about Mr. Thomas ' examination or
6 anything that would lead you so far down this line with
7 this witness.

8 MR. CAMPBELL: Our main concern was that Mr.
9 Levine had --

10 JUDGE SMITH: This is rebuttal of Mr. Levine?

11 MR. CAMPBELL: Yes.

12 JUDGE SMITH: Okay. Mr. Levine's testimony has
13 been out since February 16th, is when I received it.

14 MR. CAMPBELL: We had to ask if Mr. Levine had,
15 you know, given criticism or heard criticism of the INPO
16 Study and he had not, he had indicated that he had not
17 been aware of any.

18 JUDGE SMITH: Let's have an understanding of
19 when you are going to conclude this line of questioning.
20 It is not reliable.

21 MR. CAMPBELL: Two more questions.

22 JUDGE SMITH: His testimony is not reliable as
23 to what the INPO Study does or does not do. It is not
24 sufficiently reliable for this Board to make findings of
25 fact in initial decision in its entirety.

1 MR. CAMPBELL: I just have two more questions
2 then, not related to the INPO Study.

3 JUDGE SMITH: Let me put it to you, Mr.
4 Newberry.

5 Is your understanding of the INPO Study, as you are
6 testifying, sufficient that you would have this Board make
7 findings of fact and initial decision on it?

8 A (WITNESS NEWBERRY) No, sir. I think there are people
9 that are spending considerably more time of the review of
10 the precursor study, the INPO report and the [whole report
11 who could comment on it much better than I could.

12 JUDGE SMITH: All right.

13 BY MR. CAMPBELL:

14 Q Is the Nuclear Regulatory Commission expecting another
15 degraded core accident type similar to Three Mile
16 Island?

17 A (WITNESS HULMAN) Are we expecting one?

18 Q Or preparing for one. Hiding from one?

19 MR. RAWSON: Objection. May we have that
20 comment stricken, your Honor?

21 MR. CAMPBELL: Strike that comment.

22 Preparing for or anticipating.

23 A (WITNESS HULMAN) We are -- well, I have had five
24 different forms of the question.

25 Can I have one question, please?

1 BY MR. CAMPBELL:

2 Q Is the NRC preparing for another degraded core type
3 accident within the next 10 or 20 years?

4 A (WITNESS HULMAN) Yes.

5 Q How, how are you?

6 JUDGE SMITH: I would imagine the man could
7 spend the rest of the week telling us about all of the
8 aspects of regulation that responds to that question.

9 Unless you have a specific goal, I will entertain --
10 we will entertain an objection.

11 Where are you going? This is one of the reasons why
12 cross examination plans are so desirable.

13 MR. CAMPBELL: This was just the last. I was
14 wondering if there was any way for the NRC Staff to find --
15 you know, to look in a direction of where that next type
16 of accident would be coming from.

17 JUDGE SMITH: Well, you know, they are not
18 scheduled.

19 MR. CAMPBELL: Unfortunately, they are not. I
20 was wondering if the NRC Staff did have any way of
21 determining in which type of reactor or which type of
22 utility would be expected to experience degraded
23 core-type accidents.

24 MR. GALLO: Is that a new question? I will
25 object to it if it is.

1 Objection. It calls for speculation from the
2 witness and is not reliable evidence if adduced.

3 MR. RAWSON: We will join that objection, Judge.
4 I just don't know what probative value an answer would
5 have.

6 JUDGE SMITH: With respect to Mr. Gallo's
7 objection, whether it would be speculation on the part of
8 the witness or not, I guess we don't know. We have to put
9 it up to the witness.

10 Would it require a speculative answer?

11 A (WITNESS HULMAN) It certainly would.

12 JUDGE SMITH: Then on that basis it would be
13 objectionable and the objection is sustained.

14 BY MR. CAMPBELL:

15 Q So there is no way then for the NRC to be aware of certain
16 practices that might lead to degraded core accidents?
17 They don't have any overall system for saying, "Well, it
18 looks like this utility's practices are -- could lead to a
19 serious type of accident?"

20 A (WITNESS HULMAN) There are processes that the Commission
21 and its Staff go through to regulate license holders. The
22 LER system is one. The inspection system is another. The
23 resident program is another.

24 We are monitoring each and every holder of an
25 operating license, and the performance of that license

1 holder in meeting the Commission's regulations.

2 Q So there is an overall --

3 MR. RAWSON: Excuse me. Had the witness
4 finished his answer?

5 A (WITNESS HULMAN) I think, yes.

6 BY MR. CAMPBELL:

7 Q So there is an overall program of taking all the different
8 aspects of the NRC into account for attempting to
9 determine where the probability or possibility of an
10 accident like Three Mile Island would arise?

11 MR. GALLO: I am going to object further to this
12 question and further questions along the line as
13 irrelevant and immaterial to any of the three contentions
14 under consideration.

15 JUDGE SMITH: Well, the only contention we have
16 under consideration now is 2-A. Otherwise, they were
17 required.

18 MR. GALLO: Judge, if we use that yardstick,
19 with all due respect, I suspect a good many of these
20 questions wouldn't qualify.

21 MR. CAMPBELL: The probability of an accident
22 not under discussion?

23 MR. GALLO: We have an objection on the table.

24 JUDGE SMITH: Would you restate the objection,
25 Mr. Gallo?

1 MR. GALLO: He seems to be inquiring into the
2 processes by which the Staff might be able to predict --

3 MR. CAMPBELL: I was not, your Honor.

4 MR. GALLO: -- the occurrence of a degraded core
5 accident from reactor to reactor, from utility to utility.

6 JUDGE SMITH: Like Three Mile Island 2.

7 MR. GALLO: Like Three Mile Island 2.

8 JUDGE SMITH: That is the way I heard it.

9 MR. GALLO: And I maintain that that subject is
10 irrelevant to Contention 2-A.

11 JUDGE SMITH: I think the way you have stated
12 it, I think I can see where you are going. I sustain that
13 objection.

14 Would you explain what the generic committee does,
15 the one that the deputy director for the -- the deputy
16 executive director, Dr. Stellow, presides over?

17 A (WITNESS HULMAN) First, there is a committee, the Generic
18 Requirements Review Committee, headed by Mr. Stellow. I
19 don't think he has a Ph.D.

20 The intent of that committee is to review new or
21 emerging areas of safety concern raised by the Staff to
22 see whether they have merit and whether regulatory action
23 is justified.

24 That's one way that new issues are brought up for
25 decisionmaking.

1 There are other ways that they are brought up, new
2 issues.

3 There are also a number of issues related to
4 existing practice that are brought up in the day to day
5 regulation of operating reactors.

6 JUDGE SMITH: But the generic review committee
7 provides a systematic clearinghouse for new safety
8 concerns?

9 A (WITNESS HULMAN) It is one, yes.

10 BY MR. CAMPBELL:

11 Q Is there any way of looking at the utility's almost
12 hurried attempt at putting a reactor on line, similar to
13 Three Mile Island?

14 MR. GALLO: Objection.

15 JUDGE SMITH: Sustained.

16 MR. CAMPBELL: No more questions.

17 JUDGE SMITH: Do you want to defer your
18 examination, Mr. Gallo, until after lunch?

19 MR. GALLO: Yes, that would be fine, your Honor.

20 JUDGE SMITH: Is there any possibility we can --
21 would there be any advantage to the parties to try to
22 conclude before lunch break?

23 MR. GALLO: I am prepared to go forward if
24 that's the desire.

25 MR. RAWSON: Speaking for us or from counsel

1 table here, I am just as soon ready to go forward. I have
2 only about ten minutes of redirect examination at this
3 point.

4 I don't know whether the witnesses want a break or
5 whether the prospect of getting a plane this afternoon is

6 MR. GALLO: Could we break rather than take
7 lunch?

8 JUDGE SMITH: We will take a ten-minute break
9 and you get your notes in order and then we will return.

10 MR. RAWSON: Thank you, Judge.

11 (Recess.)

12 JUDGE SMITH: Are you ready, Mr. Gallo?

13 MR. GALLO: Yes, your Honor.

14 CROSS-EXAMINATION ON BEHALF

15 OF APPLICANT

16 BY MR. GALLO

17 Q Mr. Hulman, would you turn to Page 5-45 of the FES?

18 A (WITNESS HULMAN) Yes, sir.

19 Q You see, in the first full paragraph under the table, the
20 last sentence says, "In addition, the staff judges that
21 the additional risk for severe accidents initiated by
22 natural events or sabotage is within the uncertainty of
23 risks presented for the sequences considered here."

24 Do you see that statement?

25 A (WITNESS HULMAN) Yes, sir.

1 Q What does it mean -- what did it mean, at the time the
2 document was written, and I am quoting now, "within the
3 uncertainty of risks presented for the sequences
4 considered here"?

5 A (WITNESS HULMAN) What it meant was that if one were to
6 add the risks from external events to the risks from
7 internal events, that the sum would be within the
8 uncertainty of the internal events themselves.

9 Now, that got a little convoluted. Let me see if I
10 can break it down and make it a little more easy to
11 understand.

12 All we reported in the FES is risks from internal
13 events. We have not reported any estimates of risks from
14 external events or the sum of internal plus external; but
15 just the uncertainty on the internal event risks would
16 cover, in our opinion, the sum of the two.

17 Q What was the uncertainty of the internal risk assessment?
18 What were the -- yes, what were the uncertainty of risks
19 for internal events?

20 A (WITNESS HULMAN) My recollection is that on this
21 particular FES we did not state specific numbers in the
22 FES.

23 Q Therefore, was this statement essentially a qualitative
24 assessment?

25 A (WITNESS HULMAN) At the time this FES was written, that's

1 true.

2 Q Who was responsible for this statement?

3 Is this a Staff consensus or is this the view of an
4 individual Staff member?

5 A (WITNESS HULMAN) This is a Staff consensus.

6 Q Now, on Page 4 of your testimony you have attempted to
7 quantify the uncertainty with respect to external risk; is
8 that correct -- I am sorry -- external events?

9 MR. THOMAS: I can't hear Mr. Gallo because his
10 back is to me.

11 Maybe if I --

12 MR. GALLO: I will try to speak up.

13 Let me re-ask and repeat the question.

14 BY MR. GALLO:

15 Q On Page 4 of your testimony, it's my understanding that
16 you have attempted to quantify the uncertainties of risk
17 estimates with respect to external events; is that
18 correct?

19 A (WITNESS HULMAN) Not quite. With respect to the sum of
20 internal plus external.

21 Q Now, have you quantified -- strike that.

22 Would it be a fair reading of your testimony that
23 you have attempted to quantify the risks from internal
24 events on Page 4 of your testimony?

25 MR. THOMAS: I object on the ground it's just

1 been asked and just been answered.

2 MR. GALLO: It's a different question; but I
3 will withdraw the question and ask it differently.

4 BY MR. GALLO:

5 Q Have you quantified, on Page 4 of your testimony, the
6 uncertainty factor with respect to internal events?

7 A (WITNESS HULMAN) No.

8 Q How about with respect to external events?

9 A (WITNESS HULMAN) No.

10 JUDGE COLE: Mr. Gallo, it might be helpful if
11 you point out the paragraph where you think he might or
12 might not address that issue.

13 MR. GALLO: I am just about to do that.

14 BY MR. GALLO:

15 Q What is the purpose of the reference in your testimony to
16 the estimates at Indian Point and at Zion, and I am
17 referring specifically to the numeric estimates that are
18 contained there?

19 A (WITNESS HULMAN) The PRA's for both Zion and Indian Point
20 for the first time pointed out -- was evidence to the
21 Staff that external events could be significant
22 contributors to risk.

23 The Staff had some difficulties in -- obviously, has
24 some difficulties today -- in transferring that
25 information from those specific reactors at those specific

1 sites to other sites.

2 We have no way to do -- by any regulation or policy
3 statement of requiring a site specific PRA of either
4 internal events or external events or near-term operating
5 reactor license evaluations.

6 In order to meet the Commission's policy statement,
7 it was a Staff judgment that we need to explain how bad
8 the risks could be to attempt to put an upper bound, so to
9 speak, on those risk numbers.

10 Page 4 of our testimony is intended to do that.
11 It's a judgment call; an attempt to put numbers on the
12 upper level of risk, the upper bound of risk, based upon
13 the information we had at Zion and Indian Point but
14 without site specific study.

15 Q Now, if I understand correctly, there was a numeric
16 estimate of risk from internal events presented in the
17 FES; is that correct?

18 A (WITNESS HULMAN) That's correct.

19 Q The only thing we didn't have as a numeric value was the
20 uncertainty factor as to those estimates?

21 A (WITNESS HULMAN) Not correct. We didn't have an estimate
22 of the contribution to risk from external events.

23 Q All right. I stand corrected.

24 Did we have an uncertainty -- what was the
25 uncertainty factor with respect to the risk estimates in

1 the FES with respect to internal events?

2 A (WITNESS HULMAN) I believe you previously asked me that
3 question and I said we provided no numerical estimates.

4 Q Well, let's see if we can't get this thing straight.

5 Is it fair to say that the information in the FES,
6 as presented at the time it was written, contains no
7 numerical estimate as to the uncertainty with respect to
8 the risk estimates as to internal events?

9 A (WITNESS HULMAN) That's my understanding.

10 Q All right. Now, if I look at Page 4 of your testimony,
11 specifically at the middle of the page, and going down --
12 it would be the last full paragraph on the page, the
13 second sentence, "That is, the Staff's best estimate of
14 accident risks from internal and external causes,
15 exclusive of sabotage and based upon what has been learned
16 at Zion and Indian Point, could be higher than what has
17 been presented in the FES, but is unlikely to exceed the
18 risk multipliers computed for Indian Point and Zion.

19 Higher than what in the context of this sentence?

20 A (WITNESS HULMAN) The previous paragraph indicates what
21 the risk multipliers are.

22 Those risk multipliers were estimated on the basis
23 of ratios of risks with and without external events in the
24 several different risk categories identified in both the
25 Zion and Indian Point PRA's. They are the biggest numbers

1 we could get from --

2 Q Now, were those -- I am sorry.

3 A (WITNESS HULMAN) -- computing risk ratios.

4 Q Were those risk multipliers for Zion and Indian Point used
5 as a basis of the writeup in the FES?

6 A (WITNESS HULMAN) No.

7 Q Then we go back to the sentence and we say -- and the
8 sentence I am referring to is the one I just quoted, "That
9 is, the Staff's best estimate," et cetera, "could be
10 higher than what has been presented in the FES."

11 Now, I am trying to get a comprehension of what
12 relationship you are drawing here.

13 That is why I repeat my question: Higher than what?
14 What has been presented in the FES that has suddenly been
15 exceeded by your testimony here on Page 4?

16 A (WITNESS HULMAN) The FES lists a number of accident
17 risks. They are summarized in Table 5.12 on Page 5-54.

18 There are several different categories of risks
19 identified. Consequences and probabilities are both
20 listed.

21 I might note that, for example, you would have to
22 have a probability of an event less than five times ten to
23 the minus six or once in 500,000 years before anybody
24 would get an exposure in excess of 200 rems or before
25 there would be an early fatality.

1 It is this summary of risks that I was referring to.

2 Q This is on Page 5-54?

3 A (WITNESS HULMAN) 5-54.

4 Q Is this a summary of risks from --

5 A (WITNESS HULMAN) Excuse me.

6 Q I am sorry.

7 A (WITNESS HULMAN) Mr. Wohl also suggests on Page 5-60,
8 Table 5.13, which gives the average values of
9 environmental risks per reactor year.

10 It's this same data that we are referring to.

11 Q Now, are the risks depicted on these two tables from
12 internal events only?

13 A (WITNESS HULMAN) Yes.

14 Q So it's your testimony -- and correct me if I am wrong --
15 that the risks on Table 5.12 and the other table you refer
16 to in your testimony may be higher when you include --
17 when you sum both the internal and external events? --

18 A That's correct.

19 Q Then returning to Page 4, you say, at the bottom of your
20 testimony on that page, that it could be higher than what
21 was presented in the tables in the FES but is unlikely to
22 exceed the risk multipliers computed for Indian Point and
23 Zion; is that correct?

24 A (WITNESS HULMAN) Yes.

25 Q Now, what have you learned from the Zion and Indian Point

1 PRA's, to use the words of your testimony, that causes you
2 to rely on these risk estimates that you have quoted in
3 your testimony on Page 4?

4 A (WITNESS HULMAN) What I am relying upon is the conclusion
5 that we learned at Zion and Indian Point that it's
6 possible we could be understating the risks in our FES's
7 if we only reported the risks from internal events; and
8 since the information at Zion and Indian Point was the
9 only information that was available, we made a judgment
10 that it's unlikely to be any worse at Byron. There was no
11 information to the contrary.

12 And, furthermore, it's unlikely to be more than a
13 factor of -- I don't think those are the right words.

14 Neither multiplier would exceed an uncertainty range
15 of a factor of 100 on risk.

16 Q What is the basis for your judgment that the uncertainty
17 factor is, I guess, 100 times or less?

18 A (WITNESS HULMAN) We did a number of computer analyses for
19 Indian Point varying the number of parameters.

20 Those parameters varied from probability to source
21 term to population distribution, emergency planning
22 assumptions, and concluded that, based upon that
23 assessment, it was unlikely that the change in risk would
24 exceed a factor of 100.

25 Q Are these -- this analysis that you refer to, is that part

1 of the ongoing proceeding at Indian Point, part of the
2 record in that case?

3 A (WITNESS HULMAN) It is not part of the record, but it is
4 referred to in the record and testimony has been given on
5 the subject; but the details are not in evidence in that
6 proceeding.

7 Q What is the -- does this document or study have a title
8 that you can recall?

9 A (WITNESS HULMAN) No. It was Staff work; it was Staff
10 work done during the Indian Point proceeding to support
11 the judgments made by the Staff at that proceeding.

12 Q Do you know who performed the work?

13 A (WITNESS HULMAN) Several people in my branch performed
14 that work.

15 Q Who were they?

16 A One of them was Walter Pasedag, another was Sarbes
17 Acharya, Mrs. Jocelyn Mitchell. I believe Mr. Wohl was at
18 least party to part of it, and there were others.

19 Q I believe you testified yesterday that the answer
20 contained in response to Question 6, the Answer 6, was
21 your personal opinion, is that correct, or do I
22 mischaracterize it?

23 A (WITNESS HULMAN) You mischaracterize it.

24 Q Can you correct the mischaracterization?

25 A (WITNESS HULMAN) It was a consensus of a number of people

- 1 on the Staff.
- 2 Q The entire answer?
- 3 A (WITNESS HULMAN) The entire answer.
- 4 Q I assume it represents your view, Mr. Wohl; is that
- 5 correct?
- 6 A (WITNESS WOHL) I concur in this.
- 7 Q The answer is yes?
- 8 A (WITNESS WOHL) I am not the formal originator, but, yes.
- 9 Q Then, Mr. Hulman, let me ask you this question:
- 10 Does the position on the bounding of the uncertainty
- 11 factor represent a Staff consensus, the position stated in
- 12 Answer 6?
- 13 A (WITNESS HULMAN) The bounding number -- the 100?
- 14 Q Yes.
- 15 A (WITNESS HULMAN) Are you referring to the 100?
- 16 Q Yes, sir. I am sorry.
- 17 A (WITNESS HULMAN) The value of 100 I can't testify as to
- 18 whether that has Staff consensus.
- 19 Q But it has your support; is that correct?
- 20 A (WITNESS HULMAN) It has my support.
- 21 Q How about you, Mr. Wohl; does it have your support?
- 22 A (WITNESS WOHL) I think it's a very reasonable upper
- 23 limit; and I further suggest that the average incidental
- 24 risk is still very small.
- 25 Q All right. But does it have your support?

1 A (WITNESS WOHL) Yes.

2 Q Thank you.

3 Mr. Hulman, this is based on -- your opinion of the
4 100 times factor is based on this internal work that was
5 done in your branch; is that correct?

6 A (WITNESS HULMAN) That's correct, in part.

7 I might add that that internal work was also
8 supported by previous studies done by other people on the
9 NRC Staff and a large number of studies done at Sandia,
10 based upon their testing of the CRAC Code.

11 Q Can you give me some clue, first of all, what the other
12 Staff studies are that you are referring to?

13 A (WITNESS HULMAN) NUREG-771 and 772 on source terms, in
14 particular, contain Staff judgments, and some early drafts
15 of those studies contain some Staff suggestions, not in
16 consensus view at the time, as to what changes in source
17 terms would produce in the way of changes in accident
18 consequences.

19 Those studies also lend some evidence to these -- to
20 this estimate of 100.

21 Q Do those studies deal with the risk of internal events?

22 A (WITNESS HULMAN) Yes.

23 Q And as part of that, did they consider the uncertainty
24 factor associated with whatever quantification of risk was
25 contained in those documents?

1 A (WITNESS HULMAN) Yes.

2 Q And did they suggest an uncertainty factor of 100 times?

3 A (WITNESS HULMAN) They did not suggest an uncertainty
4 factor of exactly 100, but they suggested an uncertainty
5 factor -- uncertainty factors -- varying in numerical
6 value. --

7 Q So it was a range?

8 A (WITNESS HULMAN) It was a range.

9 Q Do you remember what the range was?

10 A (WITNESS HULMAN) No.

11 Q You say in your testimony -- strike that.

12 You had mentioned, in answer to one of my earlier
13 questions, that there was also some Sandia work that
14 formed a basis and support for the factor of 100 times.

15 Can you be more specific as to what you are
16 referring to?

17 A (WITNESS HULMAN) I don't have the specific publication
18 names in my mind; but there is a reference list in my
19 office and I have most of the publications on my
20 bookshelf.

21 The breadth of the publications is literally four to
22 six inches worth of Sandia reports in which various
23 evaluations using the CRAC Code and testing the
24 sensitivity of certain assumptions have been made, that,
25 in the opinion of several people on the Staff that I work

1 with, lend credence to the factor of 100.

2 Q Do those documents, to the best of your recollection,
3 suggest an uncertainty factor of 100?

4 A (WITNESS HULMAN) They help suggest it.

5 Q Do they do so expressly?

6 A (WITNESS HULMAN) No. *

7 MR. THOMAS: I am sorry. What was the last
8 question?

9 MR. GALLO: Do they do so expressly?
10 The answer was no.

11 MR. THOMAS: Yes. I heard the answer.

12 BY MR. GALLO:

13 Q In response to one of my earlier questions with respect to
14 NUREG-771 and 772, you indicated that there was a range of
15 uncertainty factors in those documents and you couldn't
16 remember what the range was.

17 Do you recall that?

18 A (WITNESS HULMAN) That is not what I said.

19 Q Tell me what you said.

20 A (WITNESS HULMAN) I said that for studies done for those
21 documents, varying various parameters in the CRAC Code,
22 that those studies also lend themselves to a conclusion
23 that there is uncertainty.

24 Q Did those studies -- I thought in answer to one of my
25 earlier questions you indicated that internal events --

1 the risk from internal events was quantified in NUREG-771
2 and 772; is that correct?

3 A (WITNESS HULMAN) No.

4 JUDGE SMITH: Mr. Gallo, do you have a cross
5 examination plan?

6 MR. GALLO: It's dwelling on this very issue.
7 That's it.

8 JUDGE SMITH: All right. You don't have one?

9 MR. GALLO: Not beyond this. This change was
10 presented.

11 JUDGE SMITH: All right, I understand.

12 MR. GALLO: Thank you.

13 (WITNESS HULMAN): Do you have a question?

14 MR. GALLO: I will state a new question.

15 BY MR. GALLO:

16 Q With respect to NUREG-771 and 772, do those two documents
17 address the risk from internal events?

18 A (WITNESS HULMAN) They addressed principally the risk
19 associated with severe core-melt accidents in which there
20 were containment failures.

21 To my recollection, there was no judgment made in
22 either document as to what the cause might have been.

23 Q So I guess -- is it your testimony that, nevertheless,
24 those two documents lent themselves to formulating your
25 judgment of a factor of 100 times?

1 A (WITNESS HULMAN) No. I again repeat that's not what I
2 said.

3 What I said was the studies made for those documents
4 lend credence to the factor of 100.

5 Q How do they do that?

6 A (WITNESS HULMAN) I repeat again that if one varies the
7 input parameters and some of the assumptions in the CRAC
8 Code, one can get estimates of uncertainty.

9 I am not inferring that the risks from external
10 events would necessarily change the source terms but more
11 likely would change accident probabilities.

12 For example, at Indian Point in particular, the same
13 kinds of accident sequences were judged to be caused --
14 could have been caused -- by either internal events or
15 external events.

16 So one can vary probability and see what impact it
17 has on risks.

18 One can vary source terms, one can vary emergency
19 planning parameters, one can vary meteorology, population.
20 There are a large number of variables that one can vary to
21 determine what possible ranges in answers might be.

22 Q Did you, in fact, conduct an analysis whereby the input
23 parameters and assumptions of the CRAC Code were varied in
24 order to support your 100 times factor?

25 A (WITNESS HULMAN) As I said, we did that using Indian

1 Point experience.

2 Q I am asking if you did.

3 A (WITNESS HULMAN) If I personally did it?

4 Q Yes.

5 A (WITNESS HULMAN) No, I didn't, but I supervised it.

6 Q What it gets back to is NUREG-771 and 772 were used as
7 source documents by your employees, your people that
8 report to you in your branch, for the performance of this
9 Indian Point analysis that you referred to earlier?

10 A (WITNESS HULMAN) That is correct.

11 Q And that is true as to the Sandia reports as well?

12 A (WITNESS HULMAN) That is correct.

13 Q Looking at this sentence that contains the factor of 100
14 times, what do you mean by "outside" -- I better read the
15 whole sentence. "Neither multiplier would result in risks
16 at Byron outside an uncertainty factor of 100 times."
17 It's the use of the term "outside" that I am questioning.

18 Just what does that mean in the context of the
19 sentence?

20 A (WITNESS HULMAN) The last sentence, the one you are
21 referring to with the word "outside" in it, is intended to
22 communicate to the reader that because we had 30 at Indian
23 Point as a multiplier and 10 at Zion, the same multipliers
24 may not be applicable to Byron.

25 The factor of 100 was an attempt to bound the total

1 risk from internal and external events at Byron; and I
2 must say an upper limit.

3 There is no reason to believe that the risks could
4 be as high as this. They may be considerably lower. They
5 could be substantially below what we have even estimated
6 in the FES.

7 So this is an upper bound, not a lower bound.

8 Q If I understood your testimony earlier this morning --
9 well, strike that.

10 Does this quantification of the uncertainty factor
11 that is asserted in your testimony in Answer 6 change the
12 conclusion in the FES that the risk assessment is a
13 reasoned analysis?

14 A (WITNESS HULMAN) No, sir, it does not change that
15 conclusion.

16 Q Why not?

17 A (WITNESS HULMAN) Even within the -- for two reasons.

18 First, it is the only information that we have
19 available and it was an attempt to bound -- I am sorry.

20 The only information that we have available on the
21 subject of external events is that that's available at
22 Zion and Indian Point.

23 With respect to how much worse it could be, even
24 with consideration of the factor of 10, 30 or 100, the
25 risks are still low; and our judgment in the FES stands.

1 Q When you say "the risks are still low," are you talking
2 about the quantifications appearing on Table 5.12 and the
3 other table -- I will get to it soon -- that was referred
4 to earlier in your testimony?

5 A (WITNESS HULMAN) Page 5-50, Table 5.13.

6 Q Yes.

7 A (WITNESS HULMAN) In particular Table 5.13, which is the
8 characterization risk.

9 If you look at Table 5.12 on Page 5-54, that's a
10 table which indicates consequences as a function of
11 probability. It is not a table of risks.

12 Q So the uncertainty factor that is in your testimony is
13 more appropriate to the results shown in 5.13; is that
14 correct?

15 A (WITNESS HULMAN) That's correct.

16 Q With respect to the Indian Point PRA, I believe yesterday
17 you testified that you did not consider the document
18 reliable.

19 Is that a fair characterization of your memory of
20 your testimony?

21 A (WITNESS HULMAN) I don't believe I characterized the
22 Indian Point PRA as unreliable.

23 I think what I indicated was that I believed that
24 the transfer directly to Byron was not reliable.

25 Q And why is that?

1 A (WITNESS HULMAN) I don't -- I will give you one good
2 example of why not.

3 One of the principal risk contributors at Indian
4 Point was hurricane and the fact that the hurricane could
5 cause a loss of offsite power and a failure of a diesel
6 generator building simultaneously.

7 The risks of a hurricane doing that to Byron -- the
8 probability of such an event doing that same set of
9 accident sequence at Byron is much less. Therefore, one
10 cannot transfer the information from Indian Point to Byron
11 on external events.

12 Q You didn't mean to indicate that the Indian Point PRA was
13 not reliable for its intended purpose?

14 A (WITNESS HULMAN) That is correct.

15 Q Is that also true of the Zion PRA?

16 A (WITNESS HULMAN) That is also true for the Zion PRA.

17 MR. GALLO: May I have a minute, your Honor?

18 JUDGE SMITH: Yes.

19 MR. GALLO: Judge Smith, I have no further
20 questions of the panel.

21 I appreciate their indulgence with my clumsy
22 questions.

23 I would like to reserve at this time the
24 opportunity, after we have had the chance to read the
25 transcript, to bring back Mr. Levine as a -- potentially

1 as a rebuttal witness to be scheduled at some convenient
2 time in the future.

3 JUDGE SMITH: If there are no objections --

4 MR. RAWSON: The Staff has no objections. We
5 believe that would be customary procedure and appropriate.

6 MR. THOMAS: Is he talking about rebuttal based
7 solely upon Page 4, the revised Page 4?

8 MR. GALLO: That is fair, yes. That is the
9 answer to the question.

10 JUDGE SMITH: Are you conferring as to whether
11 you are going to object or not?

12 MR. THOMAS: Yes, please, Judge. Just a moment.

13 Well, I would object, because it's my understanding
14 that -- and this was certainly the case with regard to me.

15 It's my understanding that, although the formal
16 amendment took place after Mr. Levine testified, that
17 counsel and both parties were notified of the amendments
18 before Mr. Levine testified, and, therefore, I think it
19 comes too late.

20 I guess that that would be my basic objection.

21 JUDGE SMITH: You mean just the sequence?

22 It seems to me the basic issue is did the Applicant
23 and Mr. Levine have suitable notice, whenever given,
24 notwithstanding the sequence of the appearance of the
25 witnesses -- but whenever given, did they have suitable

1 notice for him to prepare anticipatory rebuttal.

2 MR. THOMAS: I think if notice is the issue,
3 Applicant should have objected to the amendment.

4 JUDGE SMITH: Well, they didn't; but, normally,
5 in an ordinary hearing, the parties are to make their best
6 effort to anticipate the need for rebuttal and incorporate
7 it into their written direct or, perhaps, orally make the
8 best effort.

9 Where that best effort fails, then a reasonable
10 opportunity to address evidence on rebuttal is essential
11 to a fair hearing and a full record.

12 It seems to me that the only thing that they are
13 asking for now is an opportunity to reflect to see if any
14 surprises were -- if any rebuttal is necessary.

15 If you are concerned about inconvenience, if that's
16 your concern, then maybe if Mr. Levine does find something
17 that he needs, that he feels the record has to be
18 completed, maybe that can be done on affidavit. It can be
19 stipulated, if that's your concern.

20 MR. THOMAS: No. That, I think, would be the
21 worst.

22 JUDGE SMITH: Certainly I would not expect
23 anybody to agree in advance to accept an affidavit without
24 an opportunity to cross examine.

25 I am just saying confrontation does not always

1 require the body of the witness before.

2 There could, perhaps, be some -- is your concern
3 inconvenience?

4 MR. THOMAS: Well, no -- well, I don't know.
5 You know, it's hard to know.

6 We don't have a witness, so it's certainly not
7 inconveniencing our witness.

8 We are, obviously, going to be back on other issues.

9 Now, my objection is restricted to the basis that I
10 made it on before.

11 JUDGE SMITH: My concern now is to give a carte
12 blanche to call Mr. Levine back, to obligate the Board and
13 all parties to come back, without some demonstration that
14 it be required in advance, and I don't know if we should
15 be doing that, either.

16 But I agree with you that some fair opportunity to
17 rebut this evidence has to be afforded.

18 MR. GALLO: May I be heard, Judge Smith?

19 JUDGE SMITH: Yes.

20 MR. GALLO: 2.743 says, quite clearly, that
21 every party to a proceeding shall have the right to
22 present rebuttal evidence. It is unqualified.

23 JUDGE SMITH: All right. Present it.

24 MR. GALLO: All right. Now --

25 JUDGE SMITH: Present it.

1 MR. GALLO: Now we get to the question of
2 whether or not, as a matter of fairness, we should be
3 required to present it at this point.

4 JUDGE SMITH: Right.

5 MR. GALLO: I will now address that.

6 Counsel for the Intervenors has indicated that we
7 had sufficient notice. The notice was as of yesterday.

8 It wasn't until this cross examination that I just
9 completed that we began to get an understanding of the
10 basis for the changed testimony and a better understanding
11 of just how the testimony was developed and the thought
12 processes which Mr. Hulman went through.

13 As far as the point made by counsel that because of
14 the surprise, we should have objected to the alteration of
15 the testimony, that would have been highly inappropriate.
16 The witness had to testify, his testimony had to be as he
17 saw it.

18 I would submit that we have not been given a fair
19 opportunity to even consult with Mr. Levine. Given the
20 information just elicited, it's necessary that we have
21 additional time to discuss and review the transcript; and
22 that's a routine, traditional matter in these kinds of
23 hearings.

24 Nowhere is it written that rebuttal must follow
25 immediately after the direct case is closed.

1 JUDGE SMITH: My observation -- my comments and
2 my observation go far beyond the scope of this
3 observation.

4 You are asking this Board to tell you right now that
5 you have an absolute right to call Mr. Levine back to this
6 hearing room, and that carries with it, of course, the
7 right to summon the Board members back, too.

8 I think we have a right to participate in that
9 decision and make a determination as to is it really
10 necessary?

11 I don't see that he has an absolute right to
12 rebuttal under all circumstances.

13 MR. GALLO: I --

14 JUDGE SMITH: All right. Show it to me.

15 MR. GALLO: I see no such qualifications.

16 JUDGE SMITH: Would you give me the quotation
17 again, please?

18 MR. GALLO: Section 2.743. I see no
19 qualification in that section.

20 As far as the convenience of the Board goes, the
21 Board is going to be here again, and we will strive to
22 schedule any rebuttal consistent with the Board's presence
23 in Rockford. We will not request that the Board come out
24 as a special appearance to just hear Mr. Levine's
25 rebuttal.

1 The paragraph I am referring to is 2.743 A.

2 JUDGE SMITH: I will not participate in any
3 carte blanche ruling that Mr. Levine has absolute right to
4 come back here and testify, but the other two Board
5 members wish that ruling to be made and I will make it.

6 My view would be that you would have to make a
7 demonstration of the need for it.

8 However, the ruling is that you have an absolute
9 right to bring Mr. Levine back for rebuttal testimony.

10 However, the Board will reserve its right to control
11 the way in which that testimony is presented, whether it
12 has to be presented in written form first or whatever.

13 MR. GALLO: I understand that.

14 JUDGE SMITH: I would recommend that there is
15 chaos here unless there is an understanding, but you
16 better decide, when you talk about notice, you better do
17 everything else.

18 I still think the better approach for you is to
19 petition the Board for it.

20 MR. GALLO: If I understand, the Board has ruled
21 that I have the right, based on the 2-to-1 decision, to
22 present rebuttal.

23 JUDGE SMITH: That's right.

24 MR. GALLO: We will be sensitive to the
25 procedural matters that you have raised in terms of notice

1 to the other parties and whether the rebuttal should be
2 written or however. We will be sensitive to those
3 aspects.

4 MR. THOMAS: I would just, to complete the
5 record -- since the Board has overruled the objection, my
6 objection, I would certainly ask that the rebuttal be
7 presented --

8 JUDGE SMITH: I am sorry. Mr. Thomas, would you
9 repeat it again? I missed it.

10 MR. THOMAS: I just said that since the Board
11 has overruled -- although on a split decision, but has
12 overruled my objection or at least determined that the
13 Applicant does have a right to present rebuttal, I would
14 certainly, you know, ask for discovery rights with regard
15 to that rebuttal evidence, including written testimony
16 regarding the rebuttal before it's given.

17 JUDGE SMITH: You see, you are opening up the
18 entire area of consideration of why I did not wish to open
19 the whole thing to an absolute right.

20 MR. THOMAS: I understand that; but given the
21 ruling of the Board, I don't see that I have any choice.

22 MR. GALLO: May I be heard on the latest
23 request?

24 JUDGE SMITH: Yes.

25 MR. GALLO: He is entitled to absolutely no

1 discovery right with respect to --

2 JUDGE SMITH: You are wrong, you are wrong. If
3 new information comes up, by your own measurement, if you
4 perceive a need for rebuttal that you cannot address now
5 without further study, then necessarily attendant to that
6 is the possibility that discovery may be required.

7 You can't have it both ways.

8 MR. GALLO: Well, your Honor, with all due
9 respect, we have different perceptions of what rebuttal is
10 for.

11 Let me give you an example. We have on the table
12 the factor of 100 times. We may wish to contend that 100
13 times is not correct and it ought to be something
14 different, and we may wish to proffer that contention
15 through Mr. Levine. No discovery is appropriate with
16 respect to such testimony.

17 JUDGE SMITH: How do I know? That's the
18 problem. You have highlighted the problem.

19 MR. GALLO: You see, discovery has ended under
20 the rules, Part 2. There is no right to further discovery
21 unless it's a new issue that has been developed.

22 JUDGE SMITH: Well, discovery does not end for
23 all purposes at all times.

24 The very reason why I am reluctant to give you an
25 absolute right to call him as rebuttal is the very reason

1 why I don't think we can as a Board tell Mr. Thomas that
2 there are no circumstances under which he can re-open
3 discovery.

4 It all boils down to judgment -- judgment, due
5 process and fair play. I don't believe you can give me a
6 mathematical formula that will take care of that. You
7 have not yet, at least to my satisfaction.

8 MR. GALLO: I will reserve my objection to his
9 request for discovery when he makes it.

10 JUDGE SMITH: Right.

11 MR. GALLO: All right.

12 JUDGE SMITH: The Board's ruling then is -- as
13 to your request to have an opportunity, Mr. Thomas, the
14 Board's ruling is, as to your request to have an
15 opportunity for additional discovery, that you will have
16 to make a motion in the context and demonstrate a need at
17 the time.

18 MR. THOMAS: Okay. I have no problem with that,
19 except that necessarily assumes that I am going to get
20 some prior notice of what the rebuttal is going to be.

21 JUDGE SMITH: Mr. Gallo, I believe, has
22 indicated that he is sensitive to the whole due process
23 problem that is inherent here, and I don't really see a
24 problem down the line. I don't see a problem.

25 I just have one narrow thing, and that is I was not

1 willing to participate in a ruling where, under any
2 conceivable circumstance, that man has a right to come
3 back here for rebuttal. That is the limit to my dissent
4 on it.

5 MR. THOMAS: I understand. Okay.

6 MR. GALLO: I have nothing further, your Honor.

7 JUDGE SMITH: Do you want to be heard, Mr.

8 Rawson?

9 I think you already said you have no objections.

10 MR. RAWSON: We have nothing further, Judge.

11 JUDGE COLE: Back to another subject, just a
12 couple of questions, gentlemen.

13 BOARD EXAMINATION

14 BY JUDGE COLE:

15 Q On Page 5-35 of the FES, Table 5.9 -- do you have that,
16 sir?

17 A (WITNESS HULMAN) Yes.

18 A (WITNESS WOHL) Yes.

19 Q The title of the table is, "Byron station reactor core at
20 3565 megawatts thermal."

21 What is contained in this table?

22 It appears to me to be the equilibrium concentration
23 inventory after operating for some period of time?

24 A (WITNESS WOHL) Yes, that's correct.

25 Q What is the source of the information in this table, sir?

1 A (WITNESS WOHL) The source of the information is the
2 Origen Code, which is a computer code developed at the
3 National Laboratories.

4 Q Okay. And it is the equilibrium concentration?

5 A (WITNESS WOHL) Yes.

6 Q All right. Thank you.

7 Really, one series of questions that all lead in one
8 direction. Any one of you can answer it.

9 In reading through your testimony and the FES, I had
10 some difficulty in making a determination as to exactly
11 how you determined which accidents were considered and
12 evaluated under the Class 9 NEPA evaluation.

13 Could you explain that to me, sir, any one of you?

14 A (WITNESS WOHL) We receive, at our branch, recommendations
15 as to the accident sequences to be used in these analyses
16 from the Office of Research.

17 As a result of the rebaselining studies, the accident
18 sequences were boiled down to four main sequences. They
19 are Event V, TMLB prime, PWR 3 and PWR 7.

20 Of these, the first two, Event V and TMLB prime, are
21 by far the largest potential contributors to risk.

22 Associated with each of these sequences is a
23 probability, given to us by our research people, a time to
24 release, an expansion factor and a warning time, a
25 sensible heat figure, which is a measure of the energy of

1 release, and a release height.

2 All of these are considered in the analyses and
3 weighted with respect to their respective probabilities of
4 occurrence; and the overall averaging done by the CRAC
5 Code takes all of these weighted results into account.

6 Q Now, the accident sequences that you just referred to,
7 they are listed in Table 5.11 of the FES on Page 5-45,
8 these sequences that were originally listed in the
9 WASH-1400 study and rebaselined, as it were, in your
10 words, and --

11 A (WITNESS WOHL) These are modifications of sequences
12 listed in the WASH-1400 study.

13 Some of the WASH-1400 sequences were found to be
14 unimportant and not included in what we have here.

15 I did not personally participate in the rebaselining
16 studies.

17 What we have here is the collective opinion of the
18 people working on source terms and accident sequences in
19 the Office of Research.

20 Q All right, sir. Thank you.

21 Just to depart from this line a small amount: Mr.
22 Newberry, you indicated -- when asked a question whether a
23 plant specific PRA would have been helpful to you in your
24 work on these evaluations, you indicated affirmatively,
25 you said yes, it would be helpful.

1 Do you recall that answer, sir?

2 A (WITNESS NEWBERRY) Yes, sir, I do.

3 Q Did you subsequently receive a copy of the plant specific
4 PRA for Byron?

5 MR. THOMAS: I hate to object to a Board
6 question, but, you know, we are talking about -- first of
7 all, the characterization of a plant specific PRA I think
8 is somewhat up in the air; and, secondly, you know, we are
9 examining a witness on a document that is not in evidence
10 and not a part of the record.

11 I know you realize that, but I just wanted to state
12 that before the witness answers.

13 I guess it's not an objection.

14 JUDGE COLE: I guess I will have to consult with
15 my fellow Board members here to see how I handle the
16 objection.

17 MR. GALLO: Judge Smith, may I be heard on the
18 objection at this point?

19 JUDGE SMITH: Yes.

20 MR. GALLO: Clearly where Judge Cole is going is
21 he wants to know why the witness didn't consider the
22 document useful.

23 It seems to me that is not going to the substance of
24 the document but simply going to the procedural use of the
25 document and is a permissible question.

1 JUDGE SMITH: The consideration is that the
2 Applicant has taken a litigative position by which they
3 are totally bound, as far as I am concerned, as far as the
4 Board is concerned, that they are not asking us, based
5 upon a PRA, to rule in their favor on this contention or
6 grant a license based upon that.

7 Dr. Cole is concerned that the PRA may have
8 information which the Board should know about which might
9 raise safety significance.

10 The problem is the witness might come back with
11 information saying, "Oh, yes, there are some things with
12 which we are concerned." In that event it's correct
13 inquiry.

14 If the witness comes back and says, "The PRA we
15 looked at, that is a great plan, we are not worried about
16 it," then we will have to disregard that as the basis for
17 our decision.

18 MR. THOMAS: Well, all right.

19 JUDGE COLE: So conditionally overruled.

20 (Laughter.)

21 JUDGE COLE: All right. Where were we? I had a
22 question.

23 BY JUDGE COLE:

24 Q Had you received a copy of the plant specific Byron PRA?

25 A (WITNESS NEWBERRY) Yes, I have a copy.

1 Q Have you looked at it, read it, studied it?

2 A (WITNESS NEWBERRY) I did the first. I looked at one
3 small part of it.

4 I haven't read the whole thing or studied the whole
5 thing, primarily due to having just received it recently.

6 Q All right, sir.

7 Based upon your limited review of the document -- or
8 of a certain portion of the document, is there anything
9 that you observed that would change any of your testimony
10 in this proceeding?

11 A (WITNESS NEWBERRY) No, sir.

12 Q Okay. Thank you.

13 Now, back to the other subject. On Page 9 and Page
14 10 of the testimony, and specifically in Questions 13 and
15 14, it refers to both the precursor study and the
16 application of WASH-1400 to this proceeding.

17 In the answer to Question 13, it is stated that in
18 the precursor study 82 percent of the precursor estimate
19 of severe accident frequencies comes from three events,
20 the Three Mile Island, Browns Ferry and the Rancho Seco
21 power supply failure.

22 Do you agree with that, sir?

23 A (WITNESS NEWBERRY) Yes, I do.

24 Q Now, in Question 14, the question says, "Why do these
25 omissions in WASH-1400 not invalidate the severe core

1 damage frequency estimates today with respect to their use
2 in the Byron FES."

3 The way I read your answer, sir, you then address
4 the TMI, you address Browns Ferry and you address the
5 Rancho Seco incidents, indicating how technical fixes have
6 been made with respect to those specific accidents and how
7 their likelihood has been subsequently reduced by virtue
8 of the actions, and by that you consider that to be a
9 response to the Question No. 14, "Why do these omissions
10 not invalidate the severe core damage estimates in
11 WASH-1400"?

12 A (WITNESS NEWBERRY) That's right.

13 Q I want to try to phrase this question properly so you will
14 understand my concern.

15 In view of the fact that WASH-1400 really did not
16 directly consider these three events, doesn't that tell
17 you something about the comprehensiveness of WASH-1400 to
18 include future events of this type and does not that -- is
19 that not, in fact -- just by virtue of 82 percent of the
20 precursor events of that type not being directly present
21 in WASH-1400, isn't that a -- doesn't that say something
22 about the applicability of WASH-1400, and could you just
23 convince me why your answer says that it does not
24 invalidate the use of that stuff?

25 Do you understand my question, my concern?

1 A (WITNESS NEWBERRY) Yes, sir, I certainly do.

2 Q Okay, sir.

3 A (WITNESS NEWBERRY) That's always a concern when you do a
4 PRA, the fact that you don't know that you have analyzed
5 everything that could happen.

6 No PRA is, quote, complete in a sense.

7 I guess the best way to respond is that one does a
8 PRA as carefully as he can, based upon his knowledge of
9 the way his plant works, the data that exists, the study
10 and the use of and the methodologies that we have talked
11 about; but part of -- and then he generates an estimate of
12 core-melt frequency, if you will, talking about the
13 front-end portion of the PRA; but in that estimate there
14 is uncertainty, not only uncertainty in the data that you
15 do have, in the models that you have developed, in the
16 human errors that you have attempted to quantify, but also
17 in the completeness question; that is, what sequences
18 that, for some reason, you haven't included in your model.

19 I guess I can only say that in looking at the
20 WASH-1400 estimates that were used in the FES, I could
21 really only deal with the information that I had -- that
22 is, those precursors that have occurred -- and tried to
23 see what they told me about the estimates used in the FES;
24 and I could look at the precursor study and look at the
25 sequences that were -- that dominated the study, were

1 important in that study, to see what they meant to the
2 sequences used in the FES, and that's what I talked about
3 in my testimony.

4 It -- certainly, it does leave you and it leaves me
5 with the question about completeness of the PRA, what is
6 the contribution of --

7 Q Sir, you keep referring to the completeness of a PRA, and
8 we don't have one in evidence here, and you didn't use one
9 in your evaluation?

10 A (WITNESS NEWBERRY) That is correct.

11 I mean the completeness of any PRA in a general
12 sense.

13 Q I would like to try to get it specific to Byron, because
14 this is where my concern is, and the applicability of
15 WASH-1400 on the basis of the validation of -- the use of
16 WASH-1400 on the basis of the information we have about
17 most of the -- of a certain type event in the precursor
18 being -- not being in listed in WASH-1400.

19 A (WITNESS NEWBERRY) Perhaps you are suggesting by doing a
20 Byron PRA, doing a plant specific review, you may find
21 something, a sequence, that wasn't in WASH-1400, that
22 wasn't in the precursor study, that wasn't in another PRA.

23 Perhaps that's true. I can't say.

24 I have a feeling that it's not very likely, but I
25 really can't say for sure.

1 That feeling is based upon what has been found in
2 the more recent PRA's.

3 I can't think of, offhand, a sequence that was found
4 to be plant specific, so to speak, at Zion, for example,
5 that was so much different from that at Indian Point.

6 I guess those are my thoughts.

7 Q All right, sir.

8 Would anyone else on the panel like to comment on
9 that?

10 (No response.)

11 JUDGE COLE: I would like to have Mr. Levine
12 comment on that, if he so wishes to comment?

13 MR. LEVINE: Gentlemen, I would like very much
14 to comment.

15 JUDGE COLE: Could you do so now, sir?

16 MR. LEVINE: Yes. WASH-1400 did not attempt to
17 quantify the probability or consequences of degraded core
18 accidents.

19 When I say "degraded core accidents," I mean
20 accidents in which the core is severely damaged
21 geometrically but does not largely melt.

22 We deliberately did not do that for two reasons.

23 One, such events, as I said yesterday, would not
24 result in challenging the integrity of the containment.
25 If the integrity of the containment is not challenged, you

1 really can't release very much radioactivity to the
2 environment.

3 Two, no one knows how to make any analyses with any
4 degree of rigor. One can only guess at how.

5 Too, our charter was not to estimate the risks to
6 the public involved in defining accident scenarios which
7 would cause the core to melt so that you could then have
8 many kinds of things occur, such as large amounts of
9 molten fuel, large amounts of hydrogen, et cetera, which
10 could, in fact, challenge the integrity of the
11 containment, which, in fact, do challenge the integrity of
12 the containment and cause it to rupture in one of several
13 ways and cause the release of amounts of radioactivity to
14 the environment.

15 So the whole discussion of degraded core accidents,
16 as I have defined them, on public risk is inappropriate,
17 in my opinion; and I do not agree with Mr. Newberry's
18 answers to any degree, except to say that I do agree you
19 cannot get mathematical closure on the completeness of
20 accident sequences -- I agree with that -- but that was
21 not the point of the question.

22 In fact, the precursor report tried to identify
23 events presumably which could lead to degraded core or to
24 core melts, and that's one of the problems with the
25 precursor report, because the event trees they drew ended

1 up in scenarios that would, in fact, cause core melt, but
2 they called them degraded cores, for some reason that I
3 don't understand, and that the authors have under
4 questioning of others, that I have not been able to
5 explain.

6 So I think that whole report is a very mixed bag of
7 things that are difficult to understand.

8 As I said before, I don't agree with the methodology
9 used in it.

10 JUDGE COLE: All right, sir.

11 You stated that WASH-1400 did not consider degraded
12 core accidents; did I hear you say that, sir?

13 MR. LEVINE: That's correct. When we defined
14 system failures in accident sequences, we defined system
15 failures such that the failure would, in fact, cause the
16 core to melt. We didn't define lesser failures that might
17 cause the core to degrade.

18 We were not interested in that. That was not part
19 of our charter, and we didn't know how to do it, anyhow;
20 and today people don't know how to do it, either. It
21 hasn't been solved.

22 People are working on it, but it's an unsolved
23 problem, that kind of analysis.

24 JUDGE COLE: Does this account for the reason
25 why Rancho Seco and the TMI incident or accident were not

1 included specifically in WASH-1400?

2 MR. THOMAS: Excuse me, excuse me. This
3 testimony that's being given I don't see as being subject
4 to cross examine.

5 JUDGE SMITH: Why do you see that?

6 MR. THOMAS: Well, he is not on the stand, is
7 he?

8 JUDGE SMITH: Yes, he is.

9 JUDGE COLE: He is.

10 THE WITNESS: I am sorry.

11 MR. THOMAS: This is a panel of five now?

12 JUDGE SMITH: No. It's evidence and it's a
13 combination of direct, rebuttal, whatever; but you will
14 have full opportunity to cross examine.

15 As a matter of fact, this very approach is
16 recommended by the Commission in its policy statement on
17 and advice to adjudicating boards.

18 MR. THOMAS: So he is on the stand right now?

19 JUDGE SMITH: He is not on the stand. He is
20 under oath. He has given testimony and he is giving
21 testimony.

22 JUDGE COLE: And you can cross examination him.

23 MR. THOMAS: I can cross examination him; all
24 right.

25 MR. LEVINE: We did --

1 JUDGE COLE: Do you recall the question, Mr.
2 Levine?

3 MR. LEVINE: I recall the question.

4 We did not consider those events, since they had not
5 occurred when we did the study and they were not within
6 the charter of the study.

7 What I am saying is we did not consider events of
8 those types in our study because they were not within the
9 charter of the study.

10 JUDGE COLE: Could you briefly tell me what the
11 charter of the study was?

12 MR. LEVINE: The charter was to estimate the
13 risks to the public from the nuclear power industry, from
14 accidents in nuclear power plants -- large, commercial,
15 water-cooled, nuclear power plants.

16 So we made a judgment right at the beginning that if
17 the core didn't melt, there couldn't be very much risk,
18 because as long as you had an intact containment, very
19 little radioactivity would escape.

20 JUDGE COLE: All right, sir.

21 BY JUDGE COLE:

22 Q Now, back to the panel for a minute.

23 Does that mean that, since you used the WASH-1400 as
24 your basis, that you also did not consider accidents in
25 which the core did not melt?

1 A (WITNESS HULMAN) Are you referring to the FES?

2 Q Yes.

3 A (WITNESS HULMAN) No. We divide our FES presentation into
4 two parts.

5 The part that we have been testifying for the last
6 many hours relates to what some people have called Class 9
7 accidents, core-melt accidents.

8 Also in the FES is a discussion of design-basis
9 accidents, some of which would not result in core melt,
10 some of which would not result in any core damage.

11 JUDGE COLE: All right, sir. I think you have
12 answered that.

13 Okay. Thank you. I have no further questions right
14 now.

15 BOARD EXAMINATION

16 BY JUDGE CALLIHAN:

17 Q To the panel, I guess probably Mr. Newberry, there was, I
18 think, a statement in your earlier testimony that the
19 Browns Ferry event exceeded design bases or design basis
20 accidents.

21 In what manner did it?

22 A (WITNESS NEWBERRY) The basis for my statement is that
23 multiple failures occurred of safety systems in that
24 event.

25 Q Now I have a few just odd remarks to clarify a few points.

1 Table 5.11 on Page 5-45 of the FES and earlier
2 testimony made reference to rebaselining, the caption of
3 Table 5.11.

4 What is rebaselining, please?

5 A (WITNESS WOHL) Rebaslining was a technique of taking the
6 WASH-1400 source terms and cutting out the fat, cutting
7 out sequences and source terms for those sequences which
8 did not contribute in any measurable way to the overall
9 risk that was calculated, and in boiling down the original
10 WASH-1400 sequences from a total of, I think it's, nine,
11 possibly ten, to four that we feel are now the predominant
12 sequences for PWR's, which are listed in Table 5.11.

13 Q Maybe I should go back and ask what baselining is, if I
14 may, please?

15 A (WITNESS WOHL) I don't think we every defined a term
16 called baselining; and I just want to caution everybody
17 that rebaselining is not a very exact term.

18 All it really means is that we had certain base line
19 fractions of core inventory and event sequences for
20 WASH-1400, and the rebaselining means the readjustment,
21 elimination, of some combinations or others, to come up
22 with new and more appropriate sequences and source terms;
23 but baselining per se I have never seen defined.

24 Q Very well.

25 Tables 5.12 and 5.13 in the FES, which have been

1 under discussion at Pages 5-54 and 5-60 respectively, have
2 been alluded to in the testimony.

3 Do the Indian Point and the Zion experiences reflect
4 in any way in the values given in those tables, and, if
5 so, how?

6 A (WITNESS HULMAN) The Zion and Indian Point estimates are
7 not reflected in those tables.

8 You used the word "experience."

9 I don't believe we have had any serious accident at
10 Zion or Indian Point.

11 These numbers were estimated, using many of the same
12 assumptions that were used in the Zion and Indian Point
13 PRA's, but not all of them.

14 These are not Zion and Indian Point numbers. These
15 are numbers specifically for Byron.

16 Q My word "experience " didn't mean events at sites. It
17 meant the use of some information from Byron and Indian
18 Point.

19 Now, does that modify your answer any?

20 A (WITNESS HULMAN) No; it's the same answer.

21 These numbers in these tables do not reflect
22 specific data from Zion and Indian Point.

23 Q Suppose that one were examining a site. Suppose there
24 were only Byron 1, no Byron 2, and the Staff makes some
25 evaluation of releases and potentials to the public and so

1 forth and comes up with an FES in values such as these
2 tables, and many others, no doubt.

3 And as a prelude, can you give me the order of
4 magnitude of the distance between Byron 1 and Byron 2
5 reactors; a tenth-of-a-mile, a mile, ten miles, just some
6 figure? What do you think it is?

7 A (WITNESS HULMAN) They are within a -- I don't know the
8 number, but within a few hundred feet of one another.

9 Q Okay. So it's the order of a tenth-of-a-mile?

10 A (WITNESS HULMAN) Yes, sir.

11 Q That is all I sought.

12 So now you have evaluated Byron 1, and it's the only
13 one under consideration, and you come up with your array
14 of numbers and exposures and so forth.

15 Now, suddenly Byron 2, at the distance that you have
16 presumed, appears on the scene.

17 What would you do to your analysis and how would the
18 values of incidental effects and population effects and
19 that sort of thing in the FES be altered?

20 A (WITNESS HULMAN) A good question.

21 I think that was the question -- or the kind of
22 question that the Intervenor was driving at.

23 We have, basically, concluded that the average
24 annual risks per unit for similar designs may be added.
25 If there is difference in design, if there are differences

1 in other features or in the operation of the units, the
2 numbers may be different; but, basically, one could say
3 that the per year risks in Table 5.13 might be doubled
4 with two units on a per-year basis.

5 Would you agree?

6 A (WITNESS WOHL) Yes.

7 Q You said just now that the information given in Table
8 5.13, Page 5-60, of the FES applies to only one unit?

9 A (WITNESS HULMAN) Yes, sir. It's per reactor year. That
10 is in the title.

11 The basis for the statement is that the Staff's
12 belief is that to date there has been no basis for
13 concluding that a single event could cause core melt in
14 both facilities; that core melts in the two reactors would
15 be independent of one another.

16 Q So if one considered 5.13 or something like it, Table
17 5.13, with two reactors operating, would there be any
18 modification of the values given in Table 5.13?

19 A (WITNESS HULMAN) On a per reactor year, these societal
20 risks would not be likely to change, whether on a per
21 reactor basis.

22 If one wished to talk about risks to individuals,
23 that's a function of distance, also; but the societal
24 risks that we have indicated in here have been, I think,
25 estimated on the basis of per reactor year.

1 So adding them for two units -- multiplying them by
2 two for two units would be appropriate.

3 I am not sure if my answer is clear.

4 Q Then if one -- this is the same question in different
5 words.

6 If one changed the caption of Table 5.13 to
7 something like, "accidents per site year," with Byron 1
8 and 2 both operating, what would happen to the values?

9 A (WITNESS HULMAN) The numbers would double.

10 Q Now, let's separate these two reactors. You have gone
11 from a tenth-of-a-mile to a mile a part.

12 Would you modify Table 5.13 in any way when we are
13 talking about two reactors, both operating?

14 A (WITNESS HULMAN) I don't think I can answer that
15 question.

16 I think that there comes a point at distance where
17 the societal risk, with reactors going further and further
18 apart, gets to the point where I cannot multiply those
19 numbers; but two reactors, essentially at the same site, I
20 can double those numbers, I believe; but your question
21 related to one mile. I don't know whether I can do it for
22 one mile.

23 I would have to, I think, make some computations.
24 It's an -- these numbers are averaged societal numbers.

25

1

2 Q You are not certain what would happen if they were one
3 mile apart?

4 A (WITNESS HULMAN) I am not certain.

5 Q Can you put a value on this separation distance where that
6 uncertainty you just voiced would disappear?

7 A (WITNESS HULMAN) Certainly for the two units at Byron I
8 would think the uncertainty would disappear if one assumes
9 the independence of core melt from unit to unit, but at
10 what distance that breaks down on, I wouldn't guess at
11 this point.

12 Q Is there a Staff policy or a Commission policy which
13 dictates that procedure of independence at some distance,
14 as yet undefined in this testimony, but that's all right?

15 A (WITNESS HULMAN) Distance, no, I don't believe there is;
16 but I believe 10 CFR Part 100 calls for a consideration of
17 multiple units at the same site. Whether that site is 500
18 feet or a mile apart is another question.

19 Q So there is some consideration with two reactors at the
20 same site?

21 A (WITNESS HULMAN) Yes.

22 Q And site is unsuited?

23 A (WITNESS HULMAN) What constitutes the site, whether it's
24 500 feet apart or if it's a mile apart is a question. I
25 can give you some examples of that.

1 The Salem and Hope Creek reactors are essentially at
2 the same site. They just have different names.

3 Sequoyah with two units and Watts Bar with two units
4 are at the same site, they are not that far apart.

5 The reactors on the Hanford Reservation could all be
6 called one site but we have different utilities applying
7 for licenses, so they have different sites.

8 A site is defined in the regulations. The number of
9 reactors at a site is not clear.

10 Q Nor their separation?

11 A (WITNESS HULMAN) Nor their separation.

12 Q And to repeat, that consideration stems from or that
13 absence of consideration in my terminology, that absence
14 of consideration stems from something in the regulations
15 and that's a question?

16 A (WITNESS HULMAN) No, I don't think it stems from an
17 absence in the regulations.

18 I think it stems from the concern that the drafters
19 of the regulations had over attempting to assure the
20 independence of accident risks at multiple reactor sites.

21 I think there was an obvious intent the Part 100 was
22 drafted not to -- not to define what constituted a
23 multiple unit site but to allude to the need to consider
24 such.

25 If you read the statement of considerations to 10

1 CFR Part 100 and some of the correspondence at that period
2 of time, which I have in my files at the office, one gets
3 the feeling that in several cases the drafters of Part 100
4 were not clear what constituted an acceptable separation
5 distance between units, that it might be a site function
6 in one case and it might be something else in another. It
7 wasn't clear in reading some of the background material.
8 Q Turning, really quite dramatically, to another aspect of
9 this same general consideration, and this is non-accident
10 conditions, normal operations, are there -- my question
11 is:

12 Is there any application in that consideration?

13 Not accident conditions but normal operations, my
14 same train of questions.

15 A (WITNESS HULMAN) With respect to multiple units?

16 Q Yes, of course.

17 A (WITNESS BRANAGAN) With respect to multiple units, we
18 have a rule making 50-2, dose design criteria and limits
19 on a per-site basis for normal operations; and that was
20 applied here in the Byron application.

21 Q And how does the distance between the operating units in
22 this nebulously-defined site affect the normal operation
23 evaluations of emissions?

24 A (WITNESS BRANAGAN) Well, it depends just what you are
25 talking about.

1 For the dose to the maximally-exposed individual, an
2 upper bound estimate would be that it would be a factor of
3 two higher for two units than it would be for one unit.

4 Q At what separation of the two units?

5 A (WITNESS BRANAGAN) This has been one on this line of
6 questioning.

7 Q Or within what --

8 A (WITNESS BRANAGAN) Well, if the two units were exactly
9 right on top of each other, then the dose to the
10 maximally-exposed individual would be twice that from one
11 unit. The further you start to separate them, then it
12 would be start to go -- it would be less than that and it
13 would depend upon just where that individual were located.

14 Q I presume from what you -- well, let me put it in the
15 negative.

16 In the Byron site evaluation, two units -- where do
17 you consider the two units in one respect to the other?

18 A (WITNESS BRANAGAN) I am sorry. I don't understand the
19 question.

20 Q In the case that you just mentioned.

21 A (WITNESS BRANAGAN) I am sorry. I don't understand the
22 question.

23 Q All right. Byron site, two units, both operating normal,
24 no accident condition.

25 I understood you to say that your exposure

1 considerations in that sort of thing recognized the
2 presence of two units; is that true?

3 A (WITNESS BRANAGAN) That's correct.

4 Q And in that consideration what was the separation between
5 the two units?

6 A (WITNESS BRANAGAN) I would have to refer to Appendix C,
7 where we show the dose per unit as it applies to the
8 Appendix I criteria, and then we also show what the
9 calculated doses for the site, and that would be in
10 Appendix C of the Final Environmental Statement.

11 The doses as well as the releases of effluents were
12 much less than the dose design objectives than we have in
13 the regulations and in RM 50-2.

14 Q I consider my question really very, very simple and I
15 thought it fit right on top of an earlier statement, so
16 let me deviate a bit from protocol, perhaps, and say: Once
17 in your recent remarks you said something about one
18 reactor being right on top of the other and that's what I
19 expected you to say when you -- when I asked you about the
20 evaluation of Zion.

21 I presume when you evaluated the Zion -- I beg your
22 pardon -- the Byron site, you considered one reactor on
23 top of the other; true?

24 A (WITNESS BRANAGAN) Well, I have to hedge a little on
25 that. Myself, I did not actually do the analysis in the

1 FES. The person who did that has since left our branch.

2 Q I beg your pardon?

3 A (WITNESS BRANAGAN) I have reviewed the analysis.

4 Q I mean the Staff. I don't mean any of you as an
5 individual, I mean the Staff, whoever made the evaluation.

6 A (WITNESS BRANAGAN) I am not quite sure what the
7 individual did. I would think they would have multiplied
8 by two but I have not actually checked that.

9 Q Let me ask one final question and maybe you don't have the
10 answer to it.

11 At what separation would this factor of two decrease --
12 begin to decrease and where would it go to one?

13 A (WITNESS BRANAGAN) It depends not only on the separated --
14 the dose to the maximally-exposed individual, depends not
15 only on the distance between the plants but also on the
16 location of where that individual would be. Whether the
17 individual would be on one side of the site or on the
18 other side of the site or what, at an apex to the site.

19 Q Would you agree that this was a rather complex situation
20 to analyze?

21 A (WITNESS BRANAGAN) It's something we usually analyze with
22 computer codes and getting out the maps of the site, and
23 so in that sense it is complex.

24 JUDGE CALLIHAN: Thank you. That is all I have.

25 JUDGE COLE: Just one question I forgot to ask.

BOARD EXAMINATION

BY JUDGE COLE:

1
2
3 Q On the summary page of your testimony and on Page 3 and on
4 Page 20 and also on Page 5-67 of the FES, you state close
5 to the same words, that the overall assessment of
6 environmental risk of accidents shows that it is roughly
7 comparable to the risk from normal plant operation.

8 Could you tell me how you -- what process you used
9 to make that determination? How did you come to that
10 conclusion, particularly on Page 20 where you say, "the
11 Staff concludes that radiation exposures from design-basis
12 accidents are comparable to the exposures to individuals"?

13 A (WITNESS BRANAGAN) What I did is I compared the dose
14 estimates to a maximally-exposed individual from normal
15 operations and the dose estimates to the general
16 population within 50 miles, and also U. S. population
17 doses and made some rough comparisons with the doses for
18 the design-basis accident.

19 Q All right, sir.

20 So it did not include other accidents, other than
21 design-basis accidents?

22 I am looking at the statement on the summary page.

23 It says, "overall assessment of environmental risk
24 of accidents."

25 Is that just design-basis accidents?

1 A (WITNESS HULMAN) If --

2 A (WITNESS WOHL) In addition to what Dr. Branagan said, the
3 risks in Table 15.3 were considered to be in the same
4 types of range as the risks of normal operations, they are
5 very small, in other words. For instance, risk of early
6 fatality, .00026 per reactor year is an extremely small
7 number. That is probably the most important environmental
8 risk to consider. The latent cancer fatalities, .0125, is
9 a very small number.

10 In other words, we don't have any reason to believe
11 that the environmental risks that we generated with the
12 CRAC calculations exceed risks from normal operation.

13 Q All right, sir. I am looking at Page 20 where you then
14 refer just to the design-basis accidents.

15 Are you telling me, sir, that the consideration of
16 Class 9 accidents with their associated probabilities in
17 estimating their risk would not change that appreciably or
18 what are you telling me?

19 A (WITNESS HULMAN) What I think we are telling you is that
20 if one considers design-basis accidents and their
21 consequences, one finds that they do not dominate the risk
22 spectrum.

23 If one considers the so-called Class 9 or severe
24 accidents, they tend to dominate the risk spectrum.

25 If one puts that spectrum on an average annual

1 basis, one looks principally at the so-called Class 9
2 accidents; and if one compares the per year risks from
3 these Class 9 accidents, these severe accidents, with the
4 risks that have been computed for normal operation, from
5 normal effluent releases, we are saying they are roughly
6 comparable.

7 Q All right, sir; but that's not what is stated on Page 20,
8 is it?

9 A (WITNESS HULMAN) Well, I am trying to see -- where on
10 Page 20 are you referring to, sir?

11 Q The latter part of the answer to Question 20?

12 MR. CAMPBELL: The next paragraph.

13 JUDGE COLE: Yes. In the answer to Question 20,
14 the latter part of the first full paragraph.

15 A (WITNESS BRANAGAN) What I compared there, the
16 quantitative basis for that comparison was that the dose
17 to the 50-mile population, the total body of the 50-mile
18 population from one year of reactor operations is about
19 1.5 person rem. So over a 30-year plant lifetime that
20 would be roughly about 45 person rem.

21 In the design-basis accidents, there was one dose
22 estimate for the worst design-basis accident of 450 person
23 rems, and that was one of the worst design-basis
24 accidents.

25 So that's the type of comparison that I made.

1 Q Well, now, with respect to the summary statement, Item No.
2 2, the statement is "the overall assessment of
3 environmental risk of accidents shows it is roughly
4 comparable to the risk from normal plant operation."

5 A (WITNESS HULMAN) That was my answer, sir.

6 Q That was your answer; but I am talking about now the kinds
7 of accidents we are talking about.

8 Is that both the consideration of Class 9 accidents
9 in addition to the design-basis accidents or is it just
10 restricted to one or the other?

11 A (WITNESS HULMAN) I think I understand the question in
12 your mind.

13 Q All right, sir.

14 A (WITNESS HULMAN) Dr. Branagan made a comparison of doses
15 from design-basis accident with the doses from normal
16 operation without consideration of probability of
17 design-basis accidents.

18 When we considered the probability of accidents, we
19 excluded the design-basis accidents. We only considered
20 the severe accidents, because we believed they dominate
21 the risk. We believe that our normal licensing procedures
22 preclude accidents, like design-basis accidents, from
23 adversely impacting the public, takes care of those risks.
24 It's only the residual risks from severe accidents, and
25 those are the ones that we compared with normal operation

1 for that specific comparison I mentioned.

2 Q All right, sir.

3 And is that your statement in the summary page, Item
4 No. 2?

5 A (WITNESS HULMAN) I am afraid I -- let me see the first
6 summary page.

7 I would support that statement. I would write it
8 much the same way.

9 Q All right, sir. And the backup for that statement: Is
10 that contained on Page 3?

11 A (WITNESS HULMAN) Part of it is, yes.

12 The principal basis for it is the statement in that
13 second paragraph on the bottom of Page 20, the one you
14 were previously referring to. I am trying to find where
15 else it is supported.

16 Q Well, yes; but my question with 20 is it just referred to
17 design-basis accidents.

18 A (WITNESS HULMAN) In that first paragraph, that's true;
19 but in the next paragraph it doesn't refer to design-basis
20 accidents, it just uses the word "accidents."

21 JUDGE COLE: All right, sir. Thank you.

22 BOARD EXAMINATION

23 BY JUDGE CALLIHAN:

24 Q Excuse me. Before you leave, the full paragraph on Page
25 20 under Answer to Question A-20, in the final sentence,

1 where there is a comparison of exposures from normal
2 operation and design-basis accidents.

3 How many accidents?

4 A (WITNESS HULMAN) Those that are listed in the FES. I
5 don't remember the number.

6 Q All of them, any one of them?

7 A (WITNESS HULMAN) A spectrum, consideration of the entire
8 spectrum. It's not additive. It's considering the
9 spectrum.

10 Q One each of the ones listed?

11 A (WITNESS HULMAN) Yes.

12 Q Would it help if in the second line of that sentence, the
13 final sentence -- the final sentence, sorry -- "exposure
14 from a design-basis accident or one design-basis
15 accident?" Is that the meaning?

16 A (WITNESS WOHL) From individual design-basis accidents.

17 Q I beg your pardon?

18 A (WITNESS HULMAN) I think you might also say -- I believe
19 that is correct. The word "any" is probably appropriate.
20 From any design-basis accident.

21 Q Singular, accident?

22 A (WITNESS HULMAN) Yes, any.

23 Q That helps me greatly. Thank you.

24 A (WITNESS HULMAN) Any. I could say it that way or I could
25 say from design-basis accidents.

1 JUDGE CALLIHAN: I apologize for the
2 interruption. Thank you.

3 JUDGE SMITH: Is there cross examination on the
4 Board's questions?

5 MR. RAWSON: Judge Smith, if I might, I think
6 these witnesses have been on the stand much longer than we
7 thought they might be.

8 Would it be appropriate for the purpose of freshness
9 to take a ten-minute break before we continue?

10 JUDGE SMITH: I understand. Let's see if it's
11 necessary.

12 Gentlemen, do you feel the need for a break?

13 A (WITNESS HULMAN) I can always smoke my pipe.

14 MR. THOMAS: I just have one brief, narrow area
15 of re-re-recross.

16 JUDGE SMITH: How about you, do you have much in
17 redirect?

18 MR. RAWSON: About ten minutes, Judge.

19 JUDGE SMITH: How about Mr. Gallo?

20 MR. GALLO: I have no cross. I have one
21 follow-up question on redirect. When I say follow-up, I
22 mean follow-up to Dr. Cole's question to Mr. Levine, plus
23 the task of correcting the transcript in one place based
24 on yesterday's discussion.

25 JUDGE CALLIHAN: Let's take ten minutes.

1 JUDGE SMITH: We will take a ten-minute break.

2 (Recess.)

3 MR. THOMAS: Who goes next, me? Is it my turn?

4 JUDGE SMITH: Yes.

5 This is an additional round of cross examination
6 based upon the Board's questions.

7 MR. THOMAS: Right.

8 CROSS EXAMINATION

9 (Continuing.)

10 BY MR. THOMAS:

11 Q Mr. Newberry, with regard to the document which you
12 received from the Applicant and which Judge Cole
13 questioned you about, which I think bears the title,
14 "PRA," or something to that -- Byron risk assessment, what
15 portions of that document have you read

16 A (WITNESS NEWBERRY) I looked at their --

17 Q Or have you looked at it?

18 A (WITNESS NEWBERRY) Yes.

19 I looked at the summary section where they concluded --
20 where they listed the results of their sequence frequency
21 estimates and confirmed that they were lower than the
22 estimates that were used in the FES.

23 Q That's a -- the document is in two volumes; right?

24 A (WITNESS NEWBERRY) That's correct.

25 Q One very thick and one very thin.

1 Are you indicating that you read the thin document
2 or portions of it?

3 A (WITNESS NEWBERRY) No. I didn't. Due to the other
4 things that I was working on, I just didn't have the time
5 to even read through the thin one.

6 Q Okay. That's what I am trying to find out.

7 When you said you read a summary -- you read a
8 summary?

9 A (WITNESS NEWBERRY) A summary table, I guess I should
10 characterize it that way.

11 Q Was your glance at this document then limited to one
12 table?

13 A (WITNESS NEWBERRY) Yes, I would say so, in the process of
14 looking for the table.

15 MR. THOMAS: That is really all I had, just to
16 clarify the other questions.

17 JUDGE SMITH: Mr. Campbell.

18 MR. CAMPBELL: None.

19 JUDGE SMITH: Oh, you have questions of Mr.
20 Levine?

21 MR. THOMAS: Me?

22 JUDGE SMITH: Yes.

23 MR. THOMAS: No, I didn't.

24 It was the procedure which I was -- which took me by
25 surprise, not the substance of the testimony.

1 JUDGE SMITH: Mr. Levine, you recognize that
2 when you gave answers to Judge Cole's questions, that you
3 were giving them as a witness?

4 (WITNESS LEVINE): Yes, I do.

5 JUDGE SMITH: Okay. Mr. Gallo.

6 MR. GALLO: I have no further cross other than
7 the one question of redirect examination.

8 JUDGE SMITH: On.

9 MR. GALLO: Mr. Levine.

10 JUDGE SMITH: On Mr. Levine, okay.

11 Do you have redirect?

12 MR. RAWSON: Yes, sir.

13 JUDGE SMITH: All right.

14 REDIRECT EXAMINATION BY COUNSEL FOR
15 THE NUCLEAR REGULATORY COMMISSION

16 BY MR. RAWSON:

17 Q Mr. Hulman, there were some questions and answers
18 yesterday in response to questions from Mr. Thomas
19 concerning collective engineering judgment which provided
20 the basis for the Staff's qualitative assessment with
21 relation to external events.

22 Do you recall that testimony generally?

23 A (WITNESS HULMAN) Generally.

24 Q There were a couple of specific questions from Mr. Thomas
25 about consideration of the testimony of Dr. Woodard who

1 appeared earlier with respect to seismic hazard.

2 Can you tell me what if any consideration has been
3 given in this qualitative assessment of risk from external
4 events to seismicity at the Byron site?

5 A (WITNESS HULMAN) Seismicity, along with all of the other
6 hazards, both internal and external, that are considered
7 within the design bases have been considered in the
8 Staff's safety evaluation report and on follow-on
9 documents related to that report.

10 It's a fundamental part of the Staff's review
11 process to consider information such as Dr. Woodard's
12 testimony, I believe, in reaching conclusions with respect
13 to the adequacy of design bases for the Byron units.

14 Q What role, if any, do those SER discussions play in this
15 qualitative assessment of risk from external events that
16 you discussed yesterday?

17 A (WITNESS HULMAN) The principal Staff bases for judging
18 the safety of the plant is a deterministic process. There
19 are some elements that have probabilities associated with
20 them, but it's fundamentally a deterministic process.

21 To assess the risks from events beyond the design
22 bases in a probabilistic manner requires some estimates of
23 not only the probabilities of the initiating events but
24 the hazards associated with such events. It is to those
25 particular assessments of probabilities and hazards beyond

1 the design bases I was referring to yesterday when I
2 indicated a rather low judgment of confidence in such
3 estimates.

4 However, the best we have is still Indian Point and
5 Zion. Admittedly on the part of the Staff, not the best,
6 not good, but still the best we have.

7 Q There were some questions -- one question in particular
8 from Judge Smith yesterday -- about the impetus for the
9 changes on Page 4 of the prefilled testimony.

10 Let me ask you directly: Were the changes that you
11 made on Page 4 prompted in any way by testimony given by
12 any earlier witness in this proceeding?

13 A (WITNESS HULMAN) No.

14 Q Mr. Wohl, let me refer you to Page 7 of the testimony.
15 Mr. Thomas asked you several questions in relation to the
16 second sentence in the top paragraph on Page 7 of the
17 prefilled testimony. That is the sentence that begins with
18 the words, "It stated that the fault tree/event tree
19 approach," and so forth.

20 Can you tell me, please, what the words, "it
21 stated," refer to?

22 A (WITNESS WOHL) The Lewis Committee stated that in their
23 judgment the fault tree/event tree approach was the best
24 tool that they had available.

25 Q Thank you.

1 Mr. Newberry, I can't recall now whether it was
2 earlier today or yesterday, you were asked a question by
3 Mr. Thomas in which you began to refer to differences
4 between the Rancho Seco plant and the WASH-1400 Surry
5 plant.

6 Will you please describe -- are there differences
7 between the Rancho Seco plant and the WASH-1400 Surry
8 reactor which are relevant to your testimony on the
9 applicability of WASH-1400?

10 A (WITNESS NEWBERRY) Yes, there are. I discuss briefly
11 those differences in Answer 14 on Page 11 of my testimony.

12 Q If I can refer you gentlemen to Page 20. Just before the
13 break there were a series of questions asked by Judge Cole
14 about the last sentence in the first full paragraph of
15 Answer 20 and the first sentence in the following
16 paragraph.

17 Mr. Hulman or anyone else on the panel, can you
18 summarize for me the distinction between the points being
19 made in those two sentences?

20 A (WITNESS HULMAN) The last sentence in the first
21 paragraph, which starts out, "The Staff also concludes
22 that radiation exposures from design-basis accidents," is
23 a sentence intended to indicate that the doses to the
24 public that would be expected from design-basis accidents
25 are roughly comparable to the doses that the public might

1 be expected to see from just routine operation.

2 The first sentence of the next paragraph is an
3 assessment on the part of the Staff of the annual risks --
4 not doses but risks -- from operation compared to
5 accidents; and it's based principally on severe accidents.

6 There is no consideration of design-basis accident
7 probabilities or consequences in that first sentence to
8 the second paragraph.

9 Q Thank you, sir.

10 Mr. Newberry, yesterday you were asked some
11 questions, again by Mr. Thomas, in relation to the general
12 subject of the precursor study, and one of the points --
13 in the course of one of your answers you referred to
14 information obtained from other PRA's such as the Zion
15 PRA.

16 What is the basis for your knowledge concerning the
17 Zion PRA?

18 A (WITNESS NEWBERRY) I am responsible in our branch for
19 coordinating and conducting the review of the Zion PRA and
20 have been for almost a year now.

21 Q Finely, gentlemen, there has been a lot of testimony
22 regarding the question of uncertainties in evaluating the
23 risk from external events.

24 Is the Staff satisfied, despite the uncertainties
25 discussed, the Byron FES provides a reasoned and accurate

1 consideration of the operational risks at Byron?

2 A (WITNESS NEWBERRY) Yes.

3 A (WITNESS WOHL) Yes.

4 A (WITNESS BRANAGAN) Yes.

5 A (WITNESS HULMAN) Yes.

6 MR. RAWSON: Judge, I have no further questions.

7 Thank you.

8 JUDGE SMITH: Mr. Gallo.

9 REDIRECT EXAMINATION

10 (Continuing.)

11 BY MR. GALLO:

12 Q I have just one question as a follow-up to a question
13 asked by Dr. Cole with respect to the Staff's testimony
14 and Question 14.

15 Question 14 says, "Why do the omissions" -- that's
16 referring to the TMI 2 accident, the Browns Ferry, and the
17 Rancho Seco power supply failure -- "Why do those
18 omissions in WASH-1400 not invalidate the severe core
19 frequency damage estimates today with respect to their use
20 in the Byron FES," and I would ask Mr. Levine simply
21 whether or not the occurrence of those three events
22 invalidates the methodology and conclusions of WASH-1400?

23 Q They do not.

24 Q Would you explain why not?

25 A As I said earlier, precursor events which do not result in

1 large scale core melt do not affect public risk with any
2 degree of significance. The FES is trying to estimate the
3 public risk from accidents, and those must be accidents
4 that involve core melt. So the FES uses accident
5 sequences as defined in WASH-1400 with some modifications
6 to them, which are then core melt accidents to estimate
7 the public risk. So the precursor events have no impact
8 on those estimates of public risk.

9 Q Then does it make any difference whether or not the fixes
10 listed in Mr. Newberry's answer to that question have
11 occurred or not occurred, in your opinion?

12 A It has no impact on the estimates in WASH-1400 or the FES.

13 On the other hand, those fixes are good in the sense
14 that they reduce the probability of severe core damage
15 accidents.

16 MR. GALLO: I have nothing further.

17 JUDGE SMITH: Anything further?

18 JUDGE CALLIHAN: No.

19 JUDGE COLE: No.

20 JUDGE SMITH: Anything further by anybody?

21 MR. THOMAS: Yes, I have one question.

22 RECROSS EXAMINATION

23 (Continuing.)

24 BY MR. THOMAS:

25 Q You stated earlier when you responded to Judge Cole's

1 question, didn't you state that the WASH-1400 made the
2 assumption that only core melt could cause a significant
3 release to the public and therefore was injurious to the
4 public health or safety?

5 A Essentially, yes. If you had a core melt, if you did not
6 have a core melt accident, you could not have large public
7 risks.

8 Q And that was an assumption made by WASH-1400; right?

9 A Yes.

10 MR. THOMAS: Okay. That is all I have.

11 JUDGE SMITH: Gentlemen, you are excused.

12 (Witnesses excused.)

13 JUDGE SMITH: Do you want to proceed?

14 MR. GALLO: Yes, Judge Smith.

15 JUDGE SMITH: Mr. Thomas, I wonder, since you
16 have the transcript of yesterday, would you please be
17 responsible for making the correct -- noting the
18 corrections?

19 MR. THOMAS: I wondered why I had it, Judge.
20 What corrections am I noting? I don't mind doing it.

21 JUDGE SMITH: Well, the reason you have it is
22 you still have it from when it was given you earlier for
23 another purpose.

24 MR. THOMAS: I see.

25 JUDGE SMITH: Which I forget at the moment, but

1 you still have it.

2 MR. THOMAS: Yes. Corrections in -- what
3 corrections?

4 JUDGE SMITH: I think they are going to come up
5 now.

6 MR. THOMAS: Oh, okay.

7 MS. CHAVEZ: Your Honor.

8 JUDGE SMITH: Miss Chavez.

9 MS. CHAVEZ: Is this matter finished with,
10 because I have one other matter that I would like to bring
11 up before we adjourn today?

12 JUDGE SMITH: Please remind us, but now the next
13 order of business is, as you recall yesterday, because of
14 the failure to be precise as to whether we were talking
15 about the Sandia Report or the Sandia printout, Mr. Levine
16 has an opportunity to correct his testimony.

17 MR. THOMAS: Oh, that's right.

18 MR. GALLO: May I proceed, your Honor?

19 JUDGE SMITH: Yes.

20 REDIRECT EXAMINATION

21 (Continuing.)

22 BY MR. GALLO:

23 Q Mr. Levine, have you had a chance to review yesterday's
24 transcript with respect to the questions and answers given
25 involving the Sandia Report?

1 A Yes, I have.

2 Q And did you review the answers to those questions from the
3 standpoint of whether or not you were answering in the
4 context of the report itself or the computer printout?

5 A Yes, I did.

6 Q Did you detect or locate any answer that you want to
7 change or clarify as a result of the confusion of
8 yesterday?

9 A Yes, I did.

10 Q Would you please proceed?

11 A On Page 1953, Line 11.

12 Q Give the people a chance to get there.

13 A Yes.

14 MR. GALLO: Does everybody have it?

15 MR. THOMAS: Yes. I am trying to get the
16 context.

17 Okay.

18 A (Continuing.) In answering the question about the Sandia
19 study, I should first say that I had in mind the computer
20 printouts as opposed to the study and I would like to
21 correct this statement on Line 11 to indicate that.

22 I would suggest doing that by deleting the word
23 "which" and inserting in its place, "whose computer
24 printouts, which were not incorporated in that study"
25 comma.

1 BY MR. GALLO:

2 Q How would the whole sentence read?

3 A "Which was called the citing study, whose computer
4 printouts, which were not incorporated in that study,
5 predicted very large consequences."

6 I would also like to change on Line 16 of the same
7 page, to insert after the word "part" of the computer
8 printouts.

9 Q How would that read now?

10 A "I am familiar with the part of the computer printouts
11 that resulted in the predictions," et cetera, et cetera.

12 Q Are those all the changes you wish to make?

13 A Yes, sir.

14 MR. GALLO: That is all we have, your Honor.

15 MR. THOMAS: Can I ask -- may I ask some
16 questions of the witness?

17 JUDGE SMITH: Yes, but they will, of course,
18 have to be limited to the corrections.

19 MR. THOMAS: Yes, of course, of course.

20 RE-CROSS EXAMINATION

21 (Continuing.)

22 BY MR. THOMAS:

23 Q The line that you identified on Page 1953, Line 11, was
24 just about the place where we started talking about the
25 Sandia printout or -- which we referred to there as the

1 study.

2 Does this mean that you want all of your answers
3 from that point on considered as relating only to the
4 computer printout and not to the study?

5 A Yes. I think they do. It's quite clear from that point.

6 JUDGE COLE: I can't hear you, Mr. Levine.

7 A (Continuing.) I said yes, I do, and I think it's quite
8 clear after that point.

9 JUDGE SMITH: Well, except that later on when we
10 begin focusing on the possibility of confusion, there was
11 specificity sometimes as to questions.

12 So I don't recall any specific instance but it is
13 quite possible that there was a part in your testimony
14 where we did distinguish between the Sandia Report and the
15 Sandia printout.

16 A (Continuing.) We did later on, yes, yes.

17 JUDGE SMITH: Yes, later on, yes.

18 So where the distinction is made, you intended the
19 respective answer? Mr. Thomas just asked you if all of
20 your references to the Sandia study were to the printout
21 and you said yes but, that's not necessarily true.

22 A (Continuing.) Having read the transcript, I believe that
23 the words about the study and the words about the computer
24 printout are now clear and there is no ambiguity.

25 JUDGE SMITH: I agree that's the case, given the

1 general sense of his testimony.

2 MR. THOMAS: Judge, I don't necessarily quarrel
3 at all with what the witness is saying at this point.

4 I would like to, however, reserve the opportunity to
5 read the pages following, because even though he only
6 changed one or two questions and answers, they were -- you
7 know, they affect pages of testimony.

8 JUDGE SMITH: Well, I realize that.

9 MR. THOMAS: Okay.

10 JUDGE SMITH: I think that you asked Mr. Levine
11 a question and I don't think the answer that you received
12 was totally accurate, but I --

13 MR. THOMAS: It was accurate up until the point
14 where we started distinguishing between the two.

15 JUDGE SMITH: That is right. From that point
16 then the distinction is made and I see very little
17 potential for confusion, given his explanation, given the
18 continuous thread that the printout predicted consequences
19 and the report didn't. I don't see how the Board can be
20 mislead when it writes its decision.

21 MR. THOMAS: There probably isn't, but all I am
22 saying is it's very difficult for me at this point to
23 evaluate all of the questions and answers in light of the
24 changes. That's all.

25 JUDGE SMITH: Well, yes, but the problem is that

1 Mr. Levine may or may not be back, I don't know, unless
2 counsel has committed him to return.

3 MR. GALLO: I have no objection to giving Mr.
4 Thomas some time to inquire further and then make whatever
5 request after that -- not inquire further but review the
6 transcript further and then make whatever request he might
7 want to make at that time.

8 MR. THOMAS: I doubt if the matter will ever
9 come up again.

10 JUDGE SMITH: I am rather confident that's the
11 case.

12 MR. RAWSON: Judge Smith, may I ask one question
13 so I make sure that I understand the system that we are
14 adopting with respect to the system?

15 JUDGE SMITH: Yes, please.

16 RE CROSS EXAMINATION

17 (Continuing.)

18 BY MR. RAWSON:

19 Q Mr. Levine, would you please look at the same page, 1953
20 and I will refer you to the question which appears in its
21 entirety at Line 22 on that page.

22 Do you have that reference?

23 A Yes, I do.

24 Q The words there -- well, let me read the question.

25 "Do you know what sites were analyzed in the Sandia

1 study?

2 "Are we referring now to the Sandia study in its
3 entirety there or is that a reference only to the computer
4 printout?"

5 A It's the Sandia study, but the study and the computer
6 printouts looked at the same sites.

7 I really think it's unambiguous from this point.

8 Q I think it is, too. I just wanted to make sure which
9 assumption you were adopting.

10 A All right.

11 MR. RAWSON: Thank you.

12 JUDGE SMITH: Is there anything further on this
13 subject?

14 MR. THOMAS: Nothing on this.

15 JUDGE SMITH: Is there any -- well, we want to
16 have a refresher on who the witnesses will be and agree on
17 the time for reconvening and then any other business and
18 Ms. Chavez.

19 MS. CHAVEZ: Your Honor, I want to bring up a
20 matter which was discussed earlier today and pertains to
21 some of the testimony that was presented today and that
22 was discussed yesterday.

23 I am referring to Mr. Gallo's representation
24 yesterday that at least one of Applicant's steam generator
25 witnesses may or either will depend upon as a basis for

1 his testimony the Byron document that is called the risk
2 assessment for Byron.

3 I understand the Board has stated that they will not
4 take the Byron risk assessment document as evidence in
5 their consideration of the testimony in this case.

6 However, I think that Dr. Cole's questions today and
7 Mr. Thomas' questions today illustrate a difficulty which
8 I sense that we will be running into very frequently when
9 it comes time for steam generator contentions.

10 I would like to have the procedure clarified, if
11 possible, at this time.

12 Can I continue?

13 JUDGE SMITH: Sure.

14 MS. CHAVEZ: Your Honor, my perception of the
15 matter is that in cross examination of Applicant's steam
16 generator witnesses, it is going to be very difficult for
17 the cross examiner to determine when it is that a witness
18 is relying upon the Byron risk assessment document as a
19 basis for his testimony unless we go through at the outset
20 of that witness' testimony a series of questions which
21 essentially say, "Have you looked at the document? Are
22 you familiar with it? Did you use it in any portion of
23 your testimony?" and so on and so forth.

24 It's a very time-consuming process to have to go
25 through for a document, which, as I understand it, the

1 Applicant has indicated that it will not put into the
2 record because either it did not consider it important
3 enough to put in or because of the timeliness issue.

4 For my position I would object to having to cross
5 examine the witnesses on the document which has not been
6 submitted formally into the record without having a basis
7 upon which to examine the validity of that document.

8 So my objection would be -- you know, I would object
9 to not being able to either have the document out of this
10 case entirely or else having somebody on that stand to
11 defend it.

12 JUDGE SMITH: Now, Mr. Gallo.

13 MR. GALLO: Judge Smith, I think I can respond
14 to all the points made by Ms. Chavez.

15 First of all, the document was submitted with the
16 qualification and with the statement that it would not be
17 introduced into evidence as an exhibit but that it might
18 be used as a source document for the testimony of
19 witnesses to be presented in the case.

20 I don't believe that Ms. Chavez characterization of
21 the Board's ruling today with respect to the Byron PRA
22 document is accurate.

23 As I understood, the Board's conclusion was that the
24 document, the Byron PRA, would form no basis for the
25 Board's decision with respect to the contentions we have

1 been litigating today, and making no ruling whatsoever as
2 to other contentions until we get to them.

3 JUDGE SMITH: Specifically the contentions which
4 allegation that Byron should not be permitted to operate
5 unless there is a PRA?

6 MR. GALLO: Yes. That is Contentions 8, 62 and
7 2-A.

8 JUDGE SMITH: Yes, right.

9 MR. RAWSON: If I might comment, I don't think
10 any of the contentions state it quite that way and, in
11 fact, in responses to discovery requests from the Staff,
12 the League of Women Voters specifically said that they
13 were not taking that position. So I don't want the Board
14 to be misled in that regard.

15 JUDGE SMITH: Well, thank you.

16 MR. RAWSON: One of the things that we will be
17 considering in light of this, the direction is in which
18 the League's cross examination went, is whether we
19 perceive a need at this point to introduce that
20 interrogatory answer in evidence and we will do that as
21 appropriately as possible, but I just want to be sure --

22 JUDGE SMITH: Which contention refers to the
23 PRA?

24 MR. RAWSON: Judge, I don't believe any of the
25 three contentions in question specifically state there is

1 a need for a Byron specific PRA. There was some
2 suggestion in discovery responses early on in the case
3 that was the position being taken by the Rockford League
4 of Women Voters Intervenors, but that was subsequently
5 changed by a later interrogatory answer.

6 Contention 8 criticizes, if I can characterize it
7 this way -- other counsel will disagree with me if I
8 mischaracterize it -- Contention 8 attacks as an
9 inadequacy what has been done but it does not assert the
10 need for the Byron specific PRA in order to remedy the
11 perceived inadequacies.

12 MR. THOMAS: Explicitly.

13 MR. RAWSON: Explicitly.

14 If we want to be explicit, there was an
15 interrogatory directed to the League by the Staff, which
16 asked, "Is it the League's position that the NRC
17 regulations require the performance of a plant specific
18 PRA prior to the issuance of an operating license?" The
19 answer is "No," close quote.

20 So I think that bears on the positions being taken
21 by the parties and what the League of Women Voters
22 perceives to be its contention and what the parties in
23 reliance on that perceive to be the contention.

24 MR. GALLO: We can argue all of this, your
25 Honor, in the findings of fact and conclusions of law.

1 MR. RAWSON: We certainly can.

2 MR. GALLO: Ms. Chavez' main point she is
3 concerned in her litigation in handling the steam
4 generator tube contention.

5 She says she is uncertain as to which of the proper
6 witnesses relied on the PRA and which didn't.

7 I think reading the testimony makes it fairly clear
8 which witness did and I identified him earlier today as
9 Mr. Hitchler. Beyond that she can use the document for
10 cross examination, as the Board well knows, she can use
11 the document for cross examination purposes to the extent
12 she desires. It does not have to be into evidence for
13 that purpose.

14 So I don't see that her ability to litigate the
15 steam generator tube issue is effected at all by the
16 present status of the Byron PRA.

17 JUDGE SMITH: Is the direct written testimony on
18 the stem generator tube issue dependent upon the PRA?

19 MR. GALLO: There are -- the only piece of
20 testimony that deals with the PRA or refers to information
21 in the PRA is Mr. Hitchler's testimony. His testimony has
22 incorporated into his testimony a model that was developed
23 for the PRA.

24 That model, which is in narrative form, is about ten
25 pages long in description and it is attached to his

1 testimony as an exhibit.

2 We will offer that attachment into evidence at the
3 time that he is proffered as a witness.

4 That attachment, that description of the model, also
5 appears as an appendix in the PRA document.

6 Beyond that, Mr. Hitchler does not rely on the PRA
7 at all.

8 JUDGE SMITH: What does the model refer to?

9 MR. GALLO: It's a model of the frequency of
10 occurrence of accidents coincident with steam generator
11 tube failure.

12 JUDGE SMITH: That would have been an exhibit or
13 testimony, whichever you choose to call it, which would
14 have been -- your point is it is not ineligible for
15 consideration simply because it falls -- it was used in
16 the PRA study?

17 MR. GALLO: That is correct, that is correct. I
18 have to be candid, that but for the performance of the PRA
19 we would not have had the model and that was one reason
20 for developing the PRA; but Mr. Hitchler will be qualified
21 and prepared to answer questions on the model's
22 development and its significance and its conclusions.

23 JUDGE SMITH: Ms. Chavez?

24 MS. CHAVEZ: Your Honor, it's my understanding
25 from looking at the Byron PRA risk assessment document

1 that that model and that specific analysis of tube rupture
2 events is one of the most essential pieces of analysis
3 that was done for the Byron risk assessment document; and,
4 as such, there is really no way to separate it from the
5 PRA, unless you are just to take the model and not the
6 assumptions and not the rest of the analysis and none of
7 the rest of the calculations independent of that PRA in
8 Mr. Hitchler's testimony.

9 At this time I simply don't think that that can be
10 done.

11 MR. GALLO: Well, she is just not correct. I
12 don't know how I can argue further on the point.

13 Basically, what she is complaining about is the
14 difficulty she perceives in prosecuting her case, and I
15 don't know just exactly how to respond to that.

16 JUDGE SMITH: The utility, the Applicant, can
17 meet the contention virtually in any way it chooses to.
18 It takes the risks, it has the burden of proof and it
19 takes the risks.

20 If it elects not to meet Contention 8 by introducing
21 a PRA and if it wishes to notify the parties that one
22 exists but say that it is not taking credit for it in the
23 litigation of that contention, that is a matter within the
24 discretion of the Applicant.

25 I don't understand your position that they cannot

1 approach their specific litigation on the steam generator
2 issue with whatever evidence might otherwise be relevant
3 and material and competent.

4 MS. CHAVEZ: Well, your Honor, to me merely the
5 fact that they would introduce a PRA into evidence
6 demonstrates that they have some confidence in the quality
7 of that document.

8 The fact that they do not wish to submit it directly
9 into evidence is, at least, an indirect indication to me
10 that, you know, they do not have that degree of confidence
11 necessary to defend the entire document, although they may
12 feel qualified to defend one particular portion of that
13 document; but, also, as regards their method of
14 introducing this document or serving it on the parties, I
15 want to recall to the Board's attention that the whole
16 matter of the Applicant's disclosure obligations to the
17 Board has been a matter of dispute in the past amongst the
18 parties insofar as there was dispute as to what was
19 considered proper obligations in terms of disclosure; and
20 in the past, whereas we were satisfied with the Board's
21 rulings on the documents in question that brought up the
22 whole dispute, none of those documents were in the nature
23 of a PRA for Byron.

24 JUDGE SMITH: Specifically, what would you have
25 the Board do?

1 MS. CHAVEZ: Your Honor, I would just wish that,
2 for one thing, up to this point Applicant has not clearly
3 identified those portions of the PRA or what specific use
4 that model will be in the testimony of their witnesses.

5 So if Applicant were to clearly identify those
6 portions of the Applicant's witness' testimony which will
7 pertain to the rupture event analysis, I think that would
8 be very helpful to the rest of the parties.

9 MR. GALLO: Judge, I will say for the third
10 time, it's Mr. Hitchler's testimony.

11 JUDGE SMITH: It's your position that his
12 testimony and the attachment adequately specify the --

13 MR. GALLO: That is correct.

14 JUDGE SMITH: Well, would you address that
15 exactly? Address this point exactly. He is making a
16 point that the model is attached to his testimony and is --
17 and it is referred to in his testimony.

18 Address that exact point.

19 MS. CHAVEZ: Well, my point there is that I am
20 not sure that the model taken in abstract itself would
21 stand and fall in terms of validity considering the draft
22 of the PRA.

23 JUDGE SMITH: That is going to have to be a
24 calculated risk that you might take there. You are going
25 to have an opportunity to cross examine. You may try to

1 establish on cross examination that the -- depending upon
2 the model, out of context, is not reliable.

3 Unfortunately, we weren't warned about your concern
4 and we could have had the testimony and we could have
5 looked at it and had some better concerns about what your
6 concerns are.

7 Right now, it tends to be an abstract concept that
8 we just have to come down on the side of the Applicant.
9 They can proceed in their case as they see fit, unless you
10 can clearly identify a particular problem you are going to
11 have. You are too general in your concerns. They have a
12 right to present their case and take their risks and not
13 play all of their cards, if they elect to. They don't
14 have to put all of their evidence -- I mean all of their
15 information into evidence if they don't elect to.

16 MS. CHAVEZ: I would just like for the record to
17 reserve my objection to the testimony that may be
18 presented by Applicant's witnesses on steam generators
19 which I would consider and move to strike it.

20 JUDGE SMITH: The objection, if it is an
21 objection now, it will be overruled. You will have to
22 renew it. It will be up to you to renew it in the context
23 of a particular problem and the demonstration of a
24 particular injury or a particular prejudice that you are
25 experiencing.

1 MR. THOMAS: Judge.

2 JUDGE SMITH: Mr. Thomas.

3 MR. THOMAS: Yes. I have one more item. It has
4 to do with the formula on the Board, the equation on the
5 chalkboard.

6 Since I have the transcript, I would like to bring
7 it up, since there was some objection.

8 I have identified in the record the portions where
9 Dr. Morgan addressed this equation, and for the record
10 it's Pages 1637 through 1639, and the discussion of the
11 dose limitations regarding declared pregnant women.

12 In the course of this discussion, Dr. Morgan
13 basically goes all the way through the calculation except
14 for, I think, the last line, beginning with R sub O, which
15 I take it is a matter of purely mathematical figuring.

16 JUDGE SMITH: Assume for the purpose of your
17 argument that he restated orally the entire equation.

18 MR. THOMAS: Okay. The question then is I think
19 that in order to make clear, you know, what he was talking
20 about, the equation, the formula that was being addressed
21 and that he was discussing, I think the equation should be
22 made a part of the record, the equation itself.

23 JUDGE SMITH: As an exhibit upon which we would
24 make a finding of fact?

25 MR. THOMAS: Yes.

1 JUDGE SMITH: What finding could we possibly
2 make from that formula?

3 MR. THOMAS: Well, the finding that you could
4 make from the formula based upon the discussion of the
5 formula is that the Applicant's procedures regarding
6 declared pregnant women do not provide or do not limit the
7 declared pregnant woman to the dose which they claim which
8 it does.

9 JUDGE SMITH: Which is demonstrated by that
10 formula?

11 MR. THOMAS: Yes.

12 JUDGE SMITH: Now, did we deny the parties an
13 opportunity to cross examine Dr. Morgan on that issue
14 because of the implication that he was not doing anything
15 that ended up on the record? You will remember, he was
16 admonished what he was doing on that board was not being
17 received into evidence.

18 As a result, the parties would feel no obligation to
19 cross examine on that issue; and, indeed, I don't believe
20 anybody cross examined on that formula. That, I believe,
21 is really central to the problem.

22 MR. THOMAS: I don't believe anybody cross
23 examined -- well, actually, it was during cross
24 examination that the formula came up. It was under Mr.
25 Miller's questioning that Dr. Morgan put the formula on

1 the Board to illustrate to the Applicant why they -- you
2 know, why the policy wouldn't work.

3 Now, nobody asked to reserve cross examination on
4 the subject and, as a matter of fact, Mr. Miller -- and I
5 realize that the other parties have not had a chance to
6 review these pages.

7 Mr. Miller cut off Dr. Morgan just when he was ready
8 to discuss the last line of the equation and said, "I just
9 want to know whether or not any of those equations are or
10 are not a part of Commonwealth Edison's training program."

11 JUDGE SMITH: That is what Mr. Miller said?

12 MR. THOMAS: Yes, that is what he said.

13 JUDGE SMITH: Referring to the equation on the
14 board?

15 MR. THOMAS: Yes, yes.

16 JUDGE SMITH: Then I think that might throw some
17 new light on it. We don't have the transcript before us.

18 MR. THOMAS: I realize that and I am not asking
19 you for a ruling this very minute. I don't think it's
20 necessary.

21 JUDGE SMITH: Unless the parties agree that by
22 Mr. Miller asking that question the formula should be in
23 evidence.

24 MR. RAWSON: May I be heard on this, Judge
25 Smith?

1 JUDGE SMITH: Mr. Rawson.

2 MR. RAWSON: I have a couple of points.

3 Mr. Gallo, Mr. Miller and I have obviously not had a
4 chance to review the particular portions of the transcript
5 to which Mr. Thomas has now referred.

6 It seems to me at a minimum we ought to be afforded
7 that opportunity to look over the specific transcript and
8 to present argument, if any, to the Board at some later
9 time. There is nothing urgent in the next week-and-a-half
10 as to resolution of this.

11 MR. THOMAS: I agree with that.

12 MR. RAWSON: My recollection is different,
13 obviously, than the transcript reflects. It was my
14 recollection that that statement was sort of a parting
15 comment by Dr. Morgan as he resumed his seat from the
16 Board. I have not checked my notes on that but it may
17 well be that the Applicant or the Staff will be suggesting
18 to the Board the need for a change in the transcript, a
19 correction in the transcript on that basis after we have
20 had a chance to review our respective floats.

21 Thirdly, there may be a middle ground which we would
22 be happy to discuss with Mr. Thomas and that is the option
23 of simply having the hard copy of this equation marked for
24 identification for the purposes of illustration of
25 testimony without it's being received into evidence. I

1 throw that out as simply something we may want to discuss
2 with Mr. Thomas to see if that allays his position.

3 JUDGE SMITH: Okay. In the meantime, I would
4 suggest -- as a matter of fact, we will require the
5 parties to agree that the hard copy is accurate.
6 Otherwise, we may come back some time and find the formula
7 is missing from the Board. So let's require today that at
8 least as far as accuracy of it is concerned, that's agreed
9 upon.

10 I think Dr. Cole at least looked at it and he is
11 satisfied that it was accurate.

12 MR. THOMAS: I have no objection to any of that.

13 JUDGE SMITH: Mr. Gallo.

14 MR. GALLO: Mr. Rawson's suggestions are those
15 of a statesman. I can't add to them.

16 JUDGE SMITH: We will come back to it. It will
17 be your responsibility, however, Mr. Thomas to bring the
18 matter up again.

19 MR. THOMAS: Sure, sure.

20 JUDGE SMITH: Mrs. Johnson.

21 MRS. JOHNSON: I have two letters that I have
22 been carrying around that I want to get turned in. They
23 were addressed to you. May I present them?

24 JUDGE SMITH: Yes.

25 Anything further before we discuss the next session?

1 (No response.)

2 JUDGE SMITH: All right. Then we will meet back
3 here, I suggest, at 9:00 A. M., a week from Tuesday, that
4 date being the 29th.

5 MR. GALLO: Weren't we supposed to convene at
6 1:00 o'clock on Monday, the 28th?

7 JUDGE SMITH: Is that what you wish? It will
8 not be 1:00 o'clock Monday.

9 MR. GALLO: I am not insisting. It's just my
10 memory is different, that's all.

11 JUDGE SMITH: All right. What is the -- I don't
12 recall we set a specific beginning time. We discussed
13 generally the -- all right. You are correct. We departed
14 from what we said would be the expected schedule because
15 this was expected to be a short week and the parties can
16 use the time.

17 MR. THOMAS: Right.

18 JUDGE SMITH: What is the expectation as to the
19 week of the 28th and the witnesses that we have, and those
20 witnesses, incidentally, will be the steam --

21 MR. GALLO: That is QA.

22 MR. THOMAS: That is QA.

23 JUDGE SMITH: Oh, that is a big week.

24 MR. THOMAS: Judge, I am not representing the
25 League on QA/QC, that's Jane Whicher, but I think the

1 consensus of the parties is that is going to be a pretty
2 full week.

3 Therefore, it might be for scheduling -- for the
4 Board's scheduling purposes, you might want to begin on
5 Monday instead of -- I know that Jane Whicher was
6 anticipating starting on Monday, so she is available and
7 ready to do that; but, you know, I will deliver any
8 schedule from the Board to her when I go back to Chicago.

9 JUDGE SMITH: You have five days estimated for
10 it and we have scheduled a four-day session, essentially a
11 four-day hearing week.

12 MR. THOMAS: Right. And there are, certainly, a
13 large number of witnesses on the question. That is
14 obvious.

15 JUDGE SMITH: And we are already aware of very,
16 very heavy bookings on the airlines. I really question
17 whether we could even change our schedule at this late
18 date to leave.

19 MR. THOMAS: It's up to the Board.

20 MR. GOLDBERG: I would think given your
21 observation that we could benefit from an extra half-day
22 session, hopefully, to keep it within a single week.

23 JUDGE SMITH: My worry about it is at the other
24 end if we will in fact complete that week. But let's not
25 borrow trouble.

1 MR. THOMAS: So far I think the parties have
2 been pretty good about getting the matters completed on
3 time.

4 JUDGE SMITH: Yes; but I am just pointing out
5 that we are talking about a four-day schedule for which
6 you have five days allocated.

7 MR. THOMAS: Right.

8 JUDGE SMITH: Well, we will just do our best.

9 JUDGE CALLIHAN: What is the decision, what
10 time?

11 JUDGE SMITH: We will begin at 2:30, Monday.

12 MR. THOMAS: Monday, okay.

13 JUDGE SMITH: The 21st and we will make that a
14 rather long day.

15 MR. THOMAS: The 28th.

16 JUDGE CALLIHAN: The 28th.

17 JUDGE SMITH: The 28th, and we will expect to go
18 to 6:00 o'clock.

19 MR. THOMAS: Fine.

20 JUDGE SMITH: The Applicant will lead off,
21 followed by the Staff, followed by the Intervenor,
22 followed by the Staff, is that the --

23 MR. GOLDBERG: I am not sure we discussed the
24 order. I think traditionally Staff presents their direct
25 case last if there is a direct Intervenor case, and we

1 recommend following that practice.

2 JUDGE SMITH: That is just -- that is what we
3 will look forward to.

4 Anything further?

5 MR. THOMAS: I have nothing.

6 JUDGE SMITH: We may have problems with this
7 courtroom in future weeks, but I don't know yet.

8 Is there anything further?

9 (No response.)

10 JUDGE SMITH: We will adjourn then to 2:30 P.
11 M., March 28th.

12 (Whereupon at 3:20 P. M., the hearing in
13 the above-entitled matter was recessed, to
14 reconvene at 2:30 P. M. on Monday, March
15 28, 1983.)

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NUCLEAR REGULATORY COMMISSION

This is to certify that the attached proceedings before the

ATOMIC SAFETY AND LICENSING BOARD

in the matter of: COMMONWEALTH EDISON COMPANY (Byron Nuclear
Power Station, Units 1 & 2)

Date of Proceeding: March 15 , 1983

Docket Number: 50-454-OL and 50-455-OL

Place of Proceeding: ROCKFORD, ILLINOIS

were held as herein appears, and that this is the original transcript
thereof for the file of the Commission.

G. Allen Sonntag

Official Reporter (Typed)



Official Reporter (Signature)