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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

OFFICE OF SECRETARY
REGULATORY SERVICE
STANCH

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In The Matter of: :

UNITED STATES DEPARTMENT OF ENERGY :

PROJECT MANAGEMENT CORPORATION :

TENNESSEE VALLEY AUTHORITY :

(Clinch River Breeder Reactor Plant) :

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Docket No. 50-537

Bethesda, Maryland

Wednesday, October 13, 1982

Deposition of EDWARD BRANAGAN, called for

examination by counsel for Intervenor in the

above-entitled action, pursuant to notice, at the

Nuclear Regulatory Commission Air Rights Building, 4550

Montgomery Avenue, Bethesda, Maryland, commencing at

3:20 p.m., the witnesses being sworn by Ray Heer, a

notary public in and for the State of Maryland, and the

proceedings being taken down by Stenomask by Ray Heer

and transcribed under his direction, when were present

on behalf of the respective parties:

1 APPEARANCES:

2 On behalf of Intervenors, Natural Resources
3 Defense Council and the Sierra Club:

4 BARBARA A. FINAMORE, Esq.
5 THOMAS B. COCHRAN
6 FLOYD SMITH
7 Natural Resources Defense Council, Inc.
8 1725 I Street, N.W., Suite 600
9 Washington, D.C. 20006

10 On behalf of the Department of Energy:

11 STAN ECHOLS, Esq.
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13 Department of Energy
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15 On behalf of the Nuclear Regulatory Commission:

16 DANIEL SWANSON, Esq.
17 GEORGE MIZUNO, Esq.
18 Office of the Executive Legal Director
19 U.S. Nuclear Regulatory Commission
20 Washington, D.C.

21 On behalf of Project Management Corporation:

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C O N T E N T S

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DEPOSITION OF:

EDWARD BRANAGAN

EXAMINATION BY
COUNSEL FOR INTERVENORS,
NRDC AND SIERRA CLUB

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P R O C E E D I N G S

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2 Whereupon,

3 EDWARD BRANAGAN,

4 called as a witness by counsel for the Intervenors and
5 having been first duly sworn by the Notary Public, was
6 examined and testified as follows:

7 EXAMINATION BY COUNSEL FOR INTERVENORS,

8 NATURAL RESOURCES DEFENSE FUND

9 AND THE SIERRA CLUB

10 BY MR. COCHRAN:

11 Q Dr. Branagan, refresh my memory of where the
12 genetic risks are documented in this.

13 A It is in section 5.7, and the discussion on
14 potential health impacts, part of it, is on page 5-13,
15 5-14, 5-15, and then we pick it up again over on page
16 5-19 through 21.

17 Q And I recall reading section 5725, you relied
18 on the risk coefficients in the BEIR 1 report for
19 occupational exposures, is that right?

20 A That is correct.

21 Q And your conclusion is that the BEIR 3 report
22 gives comparable values. Is that the basis? Why didn't

1 you use the numbers in BEIR 3 rather than BEIR 1?

2 A Well, if you use the values in the BEIR 3
3 report which the majority of the BEIR 3 committee would
4 recommend you use, you would get numbers a little less
5 than what you actually get in the BEIR 1 report.

6 Q When you say the majority, you are talking
7 about the overall committee or the somatic risk
8 committee?

9 A No, the National Academy of Sciences BEIR 3
10 committee. They had presented several models in there
11 for estimating potential health impacts, and the
12 majority of their members picked a certain model that
13 would give you lower impacts than the values in the BEIR
14 1 report.

15 Q And how about the somatic risk panel? How did
16 their values compare to the BEIR 1 values -- the somatic
17 risk panel of BEIR 3?

18 A That is what I was speaking to -- the somatic
19 risk.

20 Q Just to refresh your memory, the somatic risk
21 panel was Radford's panel that wrote the minority report
22 to the full committee report.

1 A Well, the majority of the members of the BEIR
2 3 committee recommended the lidium quadratic models,
3 which resulted in lower estimates for the somatic risk
4 than the BEIR 1 report.

5 Q And the majority of the members of the somatic
6 risk committee, of which Radford chaired, recommended
7 higher risk coefficients; isn't that correct?

8 A I can't substantiate that. My reading of the
9 BEIR 3 report is that the majority of the members
10 recommended the use of the linear quadratic model for
11 low LET radiation and not the linear dose response
12 model.

13 Q And, in your opinion, is that the basis for
14 their argument being called into question by the recent
15 reevaluations of the Nagasaki ABCC data?

16 A The basis for which argument?

17 Q Chosing the linear quadratic, the quadratic
18 model in BEIR 3, the majority opinion.

19 A I wouldn't characterize it the way you
20 characterized it.

21 Q How would you characterize it?

22 A I would characterize it that they are

1 reevaluating the dose estimates of Hiroshima and
2 Nagasaki and the committee is still out in regard to
3 just how the doses or the health impacts would change.
4 Just the preliminary, though --

5 Q The preliminary data suggests that they
6 underestimated the doses previously?

7 A The doses from what?

8 Q To the victims at Nagasaki.

9 A I'm not aware of that.

10 Q Are you familiar with the literature on the
11 reevaluation of the Nagasaki doses?

12 A I'm familiar with some of the literature and
13 you have to be clear when you specify which doses you
14 are talking about.

15 Q Well, what literature are you familiar with?

16 A In regard to?

17 Q The reevaluation of the Nagasaki dose data.

18 A I have read some articles in Science magazine
19 regarding the reevaluation of the Nagasaki data, and I
20 attended a conference held at the Department of Energy,
21 I think it was last November, regarding the evaluations
22 of the Hiroshima-Nagasaki data.

1 Q And is it your view that the reevaluation --
2 what is your view with regard to the likelihood of
3 having to reject the majority BEIR 3 opinion on the
4 basis of the reevaluation?

5 A I would hesitate to give an opinion on that
6 until the reevaluation is complete. It is preliminary
7 to that.

8 Q Then in the absence of that data you would say
9 that the BEIR 3 majority opinion carries with it some
10 significant uncertainty with regard to its validity?

11 A No.

12 Q Do you think it would be valid in any case, no
13 matter what the Nagasaki reevaluations came out?

14 A I think the estimates we presented here --

15 Q I'm not asking about the estimates you
16 presented in there. I'm asking about the BEIR 3
17 majority opinion on the effect of the reevaluation of
18 Nagasaki data.

19 A The effect on what?

20 Q I want to ask your opinion as to whether this
21 reevaluation of the Nagasaki data is likely to call into
22 question the validity of the BEIR 3 majority opinion

1 with regard to which dose model is most appropriate.

2 A I would suggest that that question would be
3 better put to the BEIR 3 committee and not myself.

4 Q I'm sure it would. I am asking your opinion,
5 though.

6 A As I said earlier, as near as I can tell, they
7 are just preliminary estimates on how the doses would be
8 revised and the final dose estimates have not been
9 presented yet, and it is too early to have an opinion
10 without the basic information.

11 Q Am I correct in assuming, then, in your mind
12 it could go either way?

13 A What could go either way?

14 Q When you get the new evaluations, you might
15 then decide that the model assumed by the majority of
16 the BEIR 3 committee is no longer the most appropriate
17 model, but the model assumed by the -- recommended in
18 the Radford dissent is the more appropriate.

19 A It is a possibility.

20 Q So there is at least that level of uncertainty
21 in terms of the BEIR 3 data; is that correct?

22 A There is uncertainty with regard to the BEIR 3

1 data. However, we bracketed that uncertainty in the
2 text of the draft supplement. We gave ranges of the
3 uncertainty estimates. We did not use the linear
4 quadratic model in BEIR 3. We used the linear model in
5 the BEIR 1 committee, which is the more conservative
6 model.

7 Q And that is the 135 cancer deaths per million
8 personrem?

9 A Potential cancer deaths, that is correct.

10 Q On page 5-13, now, in your view, is there any
11 expert opinion that lies outside of that range of
12 estimates for the cancer risk coefficient, say higher
13 than 135 deaths per million personrem?

14 A Yes.

15 Q And in your opinion, Dr. Morgan, one of the
16 experts -- is Dr. Morgan one of the experts that have a
17 larger -- that believes the risk coefficient should be
18 larger?

19 A My understanding is he believes the risk
20 coefficient should be larger, the risk estimate should
21 be larger.

22 Q And do you believe his analysis to be in

1 error?

2 A I am not quite sure how I would characterize
3 it.

4 Q Did Dr. Radford also believe that the risk
5 coefficient should be higher than you have assumed
6 here -- the cancer risk coefficient?

7 A I'm not sure I would agree with that.

8 Q Is Dr. Radford an expert in the field?

9 A Dr. Radford is an expert in the field. I'm
10 not sure if he would disagree with the answers that we
11 used because we did not use values that the majority of
12 the BEIR 3 committee recommended. We used higher
13 values.

14 Q Does Dr. Goffman believe that the risk
15 coefficient should be larger than the value you have
16 used?

17 A I think he does. I couldn't give you a
18 specific reference on that.

19 Q Is he an expert in this area?

20 A I'm not sure how expert he is.

21 Q In your opinion, is Dr. Goffman more of an
22 expert in the area of radiological health effects than

1 you are?

2 A I don't know what his background -- his
3 background really in very much detail.

4 Q Are you familiar with his work?

5 A Some of his work.

6 Q Have you read his latest book?

7 A Parts of it.

8 Q That's all one can expect, it's so thick.

9 (Laughter.)

10 Q Does Dr. Tamplin believe that the risk
11 estimates -- the cancer risk coefficient is larger than
12 you have assumed here?

13 A I think he does.

14 Q Is he an expert in the field?

15 A I'm not sure.

16 Q Does Alice Stewart believe that the risk
17 coefficient should be larger than the one you've assumed
18 here?

19 A I believe she does.

20 Q And is she an expert in the field?

21 A Yes, I would say she is an expert in the field.

22 Q And how about Dr. Mancuso?

1 A I don't know Dr. Mancuso's background very
2 much. I wouldn't be one to qualify whether or not they
3 are expert or how expert he is in the field. He is
4 quite controversial.

5 Q How about George Neal?

6 A George Neal?

7 Q Are you familiar with the publications by
8 Mancuso, Stewart and Neal?

9 A Yes, I am.

10 Q Does George Neal believe that the cancer risk
11 coefficient is higher than the one you have assumed
12 here?

13 A The papers that I'm familiar with, they do
14 give estimates higher than what we've used.

15 Q In summary, is it fair to say that there are a
16 number of experts in the field that believe the cancer
17 risk coefficient should be higher than the one you have
18 assumed in this document?

19 A I would say yes, if you interpret "number" to
20 mean more than one.

21 Q Well, suppose I interpret it to mean more than
22 five?

1 A You could probably find five people who would
2 think the risk estimators would be higher than the ones
3 we have estimated. How expert they are I am not quite
4 sure.

5 Q Well, is it fair to say, then, that you don't
6 know the literature well enough to know whether this 135
7 cancer deaths per million person~~em~~ is a conservative
8 value?

9 A No, that is not a correct statement. It is a
10 conservative value.

11 Q You believe it to be conservative despite the
12 fact that there are a number of experts in the field
13 that believe it ought to be larger?

14 A Yes. As I stated in the draft supplement, the
15 risk estimators that we have there are consistent with
16 the recommendations of the major radiation protection
17 organizations which consist of many individuals who have
18 had input into the deliberations for formulating risk
19 estimators.

20 Q Could you tell me, other than the members of
21 the BEIR 3 committee, who has endorsed these risk
22 estimators?

1 A I didn't say anyone specifically endorsed our
2 risk estimators. What I said is our risk estimators are
3 consistent with the recommendations of the UNSCEAR
4 committee, the International Commission on Radiological
5 Protection, the National Council on Radiation Protection
6 and Measurements, and both the BEIR 1 and the BEIR 3
7 committees.

8 Q And because of that they are conservative and
9 all of these other folks are in error?

10 A Is that a statement?

11 Q I am asking you. Do you agree with that
12 statement? I mean, is that your conclusion?

13 A My conclusion is that the values we used here
14 were conservative.

15 Q And if you conclude that the values used here
16 are conservative, doesn't it imply that these other
17 people's risk coefficients are in error?

18 A It probably does.

19 Q And yet you don't know the basis for their
20 conclusions?

21 A I know the basis for some of their
22 conclusions.

1 Q Do you know the basis for Dr. Morgan's
2 conclusions?

3 A Yes. I testified at the summer hearing last
4 summer and Dr. Morgan also testified in the area of
5 health effects, and Leonard Hamilton from Brookhaven
6 also testified.

7 Q Why is Dr. Morgan wrong?

8 A Okay. Right now we are talking very
9 generally.

10 Q Well, tell me why Dr. Morgan's estimate of the
11 cancer coefficient is in error.

12 A What risk estimator are you talking about?

13 Q The one you just agreed that was larger than
14 the 135 cancers per million personrem.

15 A I would need a specific publication and a
16 specific reference in order to go into detail as to why
17 I disagree with his estimates.

18 Q Do you know of any risk estimates that Dr.
19 Morgan has made of cancer deaths?

20 A I know of one that he had at the summer
21 hearing, which was more than a year ago.

22 Q And what numbers did he use?

1 A I think it was on the order of about ten times
2 what we used here.

3 Q And why is he in error?

4 A I'm not prepared to go into that today.

5 Q And could you tell me why Dr. Radford is in
6 error?

7 A I don't believe I said Dr. Radford was in
8 error. I think I indicated that his values might quite
9 similar to the values we have included in the draft
10 supplement.

11 Q I believe you indicated you didn't know what
12 his values were. Isn't that more correct?

13 A I know that he endorses the linear model
14 rather than the linear quadratic model, and if you do
15 use the linear model in either the BEIR 1 or the BEIR 3
16 reports, you get values very similar to what we have
17 here.

18 Q And why is Dr. Goffman in error?

19 A I have not made a detailed study of Dr.
20 Goffman's work.

21 Q And why is Dr. Tamplin in error?

22 A I have not made a detailed study of Dr.

1 Tamplin's work.

2 Q And why is Alice Stewart in error?

3 A Once again, I have not made a detailed study
4 of her specific papers.

5 Q And why is --

6 A But I do know that they are much higher than
7 the values that you get from the major radiation
8 protections in the world.

9 Q On that basis, could you have predicted the
10 theory of relativity in 1907?

11 MR. SWANSON: Objection, and that's a
12 frivolous question.

13 BY MR. COCHRAN: (Resuming)

14 Q Answer the question. He has objected for the
15 record.

16 MR. SWANSON: Tell him it's a frivolous
17 question.

18 THE WITNESS: I don't have any opinion on your
19 question.

20 BY MR. COCHRAN: (Resuming)

21 Q Do you have any basis for choosing 135 cancer
22 deaths per million personrem as opposed to a higher

1 value, other than the fact that it is consistent with
2 BEIR 1 and BEIR 3?

3 A Yes.

4 Q And what is that?

5 A It is also -- it is consistent with the
6 UNSCEAR data. It is consistent with the basic
7 epidemiological data, which is summarized in the United
8 Nations Scientific Committee on Radiation Report.

9 Q How old is that report?

10 A There are several UNSCEAR reports. There was
11 one in 1972. There was one in 1977, and there is a
12 draft one now circulating.

13 Q Which report are you referring to?

14 A The 1977 report.

15 Q And what risk coefficient did they assign in
16 that?

17 A It is on the order of 10^{-4} potential cancer
18 fatalities per rem.

19 Q And how was that number derived?

20 A It was derived from many epidemiological
21 studies concerning the victims of Hiroshima and Nagasaki
22 and the radium dial painters -- many studies.

1 Q Is it derived independently of the BEIR 1 and
2 BEIR 3 estimates, or did they just adopt one of those
3 other estimates?

4 A It was derived -- I don't know what you mean
5 by "independently."

6 Q Well, did they derive it from these -- this
7 body of epidemiological information you referred to, or
8 did they just adopt a number that the BEIR 1 or BEIR 3
9 committee had estimated?

10 A No. In that respect they were definitely
11 independent because they reviewed the basic
12 epidemiological data themselves.

13 Q And what else besides UNSCEAR?

14 A The International Commission on Radiological
15 Protection.

16 Q And what were their risk coefficients?

17 A Their risk estimators are contained in the
18 ICRP publication number 26.

19 Q And what else besides the ICRP and UNSCEAR?

20 A The National Council on Radiation Protections
21 and Measurements. They also discuss the risk from
22 radiation in various reports.

1 Q And where are their risk estimates published?

2 A I think I gave a couple of references in
3 there. There are many NCRP publications.

4 Q Well, where do they give their cancer death
5 coefficient?

6 A I couldn't give you a specific reference for
7 risk estimator. However, I could give you a number of
8 publications like NCRP report number 39, I believe it
9 is, NCRP report number 42, "Health Effects of
10 Alpha-Emitting Particles." They discuss health impacts
11 from radiation.

12 Q This 135 deaths, do you believe that is the
13 appropriate risk -- cancer risk coefficient to use in
14 estimating the potential cancers from routine,
15 accidental operations at the CRBR?

16 A Well, as stated in the text there, I said that
17 was a conservative estimate to estimate the potential
18 impacts from radiation exposure.

19 Q Is that the appropriate one to use -- this
20 conservative value or some lesser value or some larger
21 value?

22 A I think this was the appropriate one to use.

1 That is why I chose that in this draft supplement.

2 Q The 135 from BEIR 1, did it come from the risk
3 associated with occupational exposure or from the total
4 population exposure, if you know? I think I mentioned
5 something about that in my comments.

6 A The 135 potential cancer deaths per million
7 persons is based upon the BEIR 1 report, which reviewed
8 epidemiological studies for many different groups that
9 were exposed to radiation. Some of those groups were
10 occupationally exposed. Others were exposed members of
11 the general public -- for example in Hiroshima and
12 Nagasaki.

13 Q In Appendix J did you use that risk estimator
14 in calculating the health effects associated with the
15 accidents?

16 A I did not work on Appendix J.

17 Q Do you know whether that risk estimator was
18 used?

19 A I never reviewed Appendix J. I don't know.

20 Q Should I imply that the document used a
21 different risk estimator throughout the document than
22 the one presented in Chapter 5?

1 A I would have to review Appendix J to see just
2 specifically what they have used here. Based upon my
3 work on environmental impact statements for othe
4 reactors, the risk estimaters that they use are
5 typically -- they are consistent with the values that we
6 have used.

7 Q Did you use this risk estimator in terms of --
8 well, am I correct in assuming that there are no cancer
9 death estimates in the section on routine releases, or
10 are there? I just don't recall. Appendix D, did you
11 apply this risk estimator?

12 A To Appendix D?

13 Q To the dosages to estimate the cancers in
14 Appendix D.

15 A Yes.

16 Q But you don't know which risk estimator was
17 used in Appendix J?

18 A I didn't use any risk estimaters in Appendix
19 J.

20 Q You don't know what the Staff used?

21 A Not right now. I haven't reviewed the
22 specific appendix. I have an idea of what they used,

1 that they used values consistent with what we have used
2 in other parts of the document.

3 Q Are you sure they didn't use the values from
4 WASH-1400?

5 A They might have.

6 Q Why do you say that is consistent?

7 A Why do I say it is consistent?

8 Q Yes.

9 A Because the values that we used were derived
10 from the BEIR 1 report.

11 Q They are not the values in WASH-1400.

12 A They are derived. Values in WASH-1400 were
13 derived from the BEIR 1 report, so it is a common
14 basis. There are minor changes.

15 Q What do you call a "minor change"?

16 A I think there was some differences in terms of
17 the risk estimator for thyroid cancers.

18 Q To your knowledge, though, they wouldn't be
19 off by a factor of five?

20 A What wouldn't be off by a factor of five?

21 Q The cancer risk coefficient.

22 A For what?

1 Q That was applied in Appendix J as opposed to
2 the one that --

3 MR. SWANSON: Objection. He's already said he
4 doesn't know what was used in Appendix J.

5 MR. COCHRAN: He said there were minor
6 differences. I want to find out if "minor difference"
7 means a factor of five.

8 MR. SWANSON: He gave you a guess on what was
9 done elsewhere and he told you he doesn't know what is
10 in this Appendix.

11 MR. COCHRAN: I want to find out what he means
12 when he says a "minor difference." I don't know whether
13 minor difference to him means a factor of 100 or ten or
14 five or none.

15 MR. SWANSON: You can go on, but it is going
16 to be worthless. He said he doesn't know.

17 BY MR. COCHRAN: (Resuming)

18 Q To your knowledge, could the values used in
19 Appendix J be a factor of ten lower risk coefficient in
20 Appendix J than the one you have assumed here?

21 A Well, you have to be careful with your
22 terminology. You are talking about risk coefficients.

1 I did not use risk coefficients. I used risk
2 estimators. Risk coefficients are used to derive risk
3 estimators.

4 Q Well, I will use whatever language you want to
5 use. You define 135 potential deaths from cancer per
6 million persons as a risk estimator?

7 A That is correct.

8 Q Now could the risk estimator used in Appendix
9 J be lower than this number by a factor of ten?

10 A I have not specifically reviewed the risk
11 estimator in this Appendix J.

12 Q Would you consider a factor of ten a minor
13 difference?

14 A It depends upon a number of factors.

15 Q Well, overall, in terms of --

16 A Okay. For example, in the accident assessment
17 in WASH-1400 they do take into account other factors.
18 They take into account dose rate factors, which is in
19 addition to the risk estimator. So if you zero in on
20 one parameter, you have got to look at many things.

21 Q What do you mean they "take into account dose
22 rate factors" in WASH-1400? How do they take into

1 account dose rate factors in WASH-1400 for the cancer
2 risk estimator?

3 A They use a dose reduction factor in estimating
4 the doses, and it's either the estimating the doses or
5 in estimating the risk from the radiation in WASH-1400.

6 Q And what is that factor?

7 A It varies depending upon the dose rate.

8 Q Is that the appropriate factor to apply in
9 calculating the accident risk?

10 A Is what an appropriate factor?

11 Q The dose reduction factor that you referred to
12 that is used in WASH-1400 to account for dose rate
13 considerations.

14 A Well, the concept of dose reduction factors
15 has been discussed in NCRP report number 64, and they
16 recommend the use of dose reduction factors, so the
17 concept is certainly appropriate. That is why earlier I
18 said that the risk estimators that we used in Chapter
19 5.7 of the draft supplements are conservative. We do
20 not take into account dose reduction factors.

21 Q Are the dose estimators used in Appendix J
22 conservative?

1 A As I just said a number of times, Appendix
2 J -- I have not specifically read this Appendix J.

3 Q Who is responsible for supplying the dose
4 risk -- the risk estimaters, cancer risk estimaters that
5 were used in Appendix J?

6 A Well, I guess it would be the person who wrote
7 Appendix J did that analysis.

8 Q Are you responsible for the dose calculations
9 for other than Appendix J?

10 A The calculated doses from fuel fabrication
11 facility, which was in Appendix D, from the fuel
12 reprocessing plant, which is in Appendix D, and from the
13 reactor, which is in Appendix -- excuse me, Chapter 5.7.

14 Q How about from decommissioning?

15 A Decommissioning -- I did not calculate the
16 doses from decommissioning.

17 Q Who did?

18 A Frankly, I think we are getting into an area
19 here where the project manager would be better able to
20 answer. Just perchance I happen to know. Well, I'm not
21 even quite sure who did that. That would be more a
22 question for the project manager to answer.

1 Q If you were assigned the task of calculating
2 the risks associated with decommissioning of a reactor
3 for which there are various alternatives, what cancer
4 risk coefficient would you use?

5 A The cancer risk coefficients that were used in
6 evaluating the doses from decommissioning were the same
7 values that I used in Chapter 5.7. I supplied those.

8 Q And you would apply those. Is it fair to say
9 that you believe -- well, first of all, are you familiar
10 with the various ways one can decommission a nuclear
11 reactor -- entombment and dismantling and so forth?

12 A I'm generally familiar with it, but I am not
13 an expert in this area.

14 Q Are you familiar with the fact that some of
15 these involve allowing the plant to sort of be managed
16 for 150 years or so prior to dismantlement?

17 A I'm generally familiar with that, but I would
18 refer to the -- I would give deference to the specific
19 Staff member who did those analyses.

20 Q And if you were requested to calculate or work
21 on the team that calculated the dosages associated with
22 decommissioning a plant which is entombed for 130 years

1 or 150 years, what risk coefficient would you use?

2 A I did not -- I was not involved in calculating
3 the doses.

4 Q I understand. This is a hypothetical
5 question. If you were assigned the task of estimating
6 the health effects associated with decommissioning a
7 reactor by this particular methodology whereby the
8 reactor is entombed for 130 to 150 years and then
9 dismantled, what risk coefficient would you use?

10 A I would use the ones that we have used in the
11 environmental impact statement.

12 Q So you would use the 135 cancer deaths per
13 million manrem, calculate the dose to the people that
14 are decommissioning the reactor and then estimate the
15 number of deaths, is that correct?

16 A I would use the estimator that we used in the
17 draft supplement to estimate the potential cancer
18 fatalities from a decommissioning.

19 Q And if you multiply that by the estimated
20 dosages in 150 years from now when you dismantle the
21 reactor, is that correct?

22 A I think that would give you an assessment of

1 the impact.

2 Q Is that, do you think, a better way to
3 estimate the health effects in 150 years?

4 A Pardon?

5 Q Can you think of a more appropriate way to
6 estimate the health effects associated with
7 decommissioning in 150 years?

8 A There are other ways to do it. I would do it
9 the way I just explained it.

10 (Counsel for WRDC conferring.)

11 MR. COCHRAN: That's all.

12 (Whereupon, at 3:55 o'clock p.m., the taking
13 of the instant deposition ceased.)

14

EDWARD BRANAGAN

15
16 Subscribed and sworn to before me this _____ day
17 of _____, 1982.

18

NOTARY PUBLIC

19
20 My commission expires:

21

22

300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2346

CERTIFICATE OF NOTARY PUBLIC

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I, RAYMOND R. HERR III, the officer before whom the foregoing deposition was taken, do hereby certify that the witness whose testimony appears in the foregoing deposition was duly sworn by me; that the testimony of said witness was taken by me by stenotype to the best of my ability and thereafter reduced to typewriting under my direction; that said deposition is a true record of the testimony given by said witness; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this deposition was taken; and further that I am not a relative or employee of any attorney or counsel employed by the parties thereto, nor financially or otherwise interested in the outcome of the action.

Raymond R. Herr III
Notary Public in and for
the State of Maryland

My Commission expires July 1, 1986

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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In the Matter of
UNITED STATES DEPARTMENT OF ENERGY
PROJECT MANAGEMENT CORPORATION
TENNESSEE VALLEY AUTHORITY
(Clinch River Breeder Reactor Plant)

Docket No. 50-537

CERTIFICATE OF SERVICE

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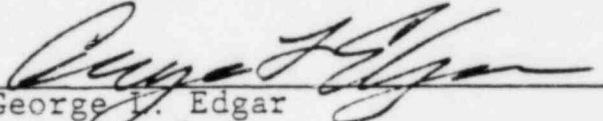
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