

854

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

RELATED CORRESPONDENCE

IN THE MATTER OF:

DOCKETED
USNRC

GEORGIA POWER COMPANY,
et al, (Vogtle Electric
Generating Plant Units
1 and 2)

DOCKET NOS. 50-424
50-425 MAY -6 AIO:45

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

- - -

Deposition of HOWARD DEUTSCH, taken on
behalf of the Applicants, pursuant to Notice,
before Mary J. Brewster, Certified Court Reporter
and Notary Public, at 1400 Candler Building,
Atlanta, Georgia, on the 25th day of March,
1985, commencing at the hour of 11:15 a.m.

- - -

STUART S. HUSEBY & ASSOCIATES, INC.

CERTIFIED SHORTHAND COURT REPORTERS

Suite 400 One Park Place
1900 Emory Street, N.W.
Atlanta, Georgia 30318
(404) 351-0300



P. O. Box 719
Gainesville, Georgia 30503
(404) 536-7028

8505060441 850325
PDR ADOCK 05000424
T PDR

DS03

1 APPEARANCES OF COUNSEL:

2 On behalf of the Applicant: HUGH E. DAVENPORT, Esq.
JAMES E. JOINER, Esq.

3 On behalf of the Deponent: GARY FLACK, Esq.

4 On behalf of the Intervenor
5 CPC: LAURIE FOWLER, Esq.

6 Also present: Tim Johnson
Willard Eoward

7 - - -

8 MR. DAVENPORT: This is the deposition of
9 Howard Deutsch, taken pursuant to Notice, with the time
10 and place agreed upon between the parties. This
11 deposition is being taken in accordance with the Nuclear
12 Regulatory Commission's rules of practice for domestic
13 licensing proceedings.

14 Mr. Flack, since your name does not appear on
15 the Notice, identify yourself and indicate who you
16 represent today.

17 MR. FLACK: Yes. I'm the attorney for
18 Mr. Howard Deutsch, the deponent. And why don't we also
19 state who else is in the room, that is to say, Laurie
20 Fowler is here on behalf of LEAF, Tim Johnson is here on
21 behalf of Campaign for a Prosperous Georgia. Jim Joiner
22 and yourself and Mr. --

23 MR. DAVENPORT: Willard Eoward, who is
24 here as a representative of the Applicant. Do you
25 represent either of the Intervenor in this action, Mr.

1 Flack?

2 MR. FLACK: I do not.

3 MR. DAVENPORT: Would you swear in the
4 witness, please.

5 HOWARD MARK DEUTSCH,
6 having been first duly sworn, was examined and
7 testified as follows:

8 CROSS-EXAMINATION

9 BY MR. DAVENPORT:

10 Q. Do you wish to reserve the right to review
11 and sign your deposition, Dr. Deutsch?

12 MR. FLACK: We'll waive his right to do
13 so.

14 Q. (By Mr. Davenport) Would you state your full
15 name for the record, please.

16 A. Howard Mark Deutsch.

17 Q. Would you spell your last name for the court
18 reporter?

19 A. D-E-U-T-S-C-H.

20 Q. What is your current address?

21 A. 765 Myrtle Street, Northeast, Atlanta,
22 Georgia 30308.

23 Q. Is that a residential address?

24 A. Yes.

25 Q. What is your business address?

1 A. School of Chemistry, Georgia Institute of
2 Technology, Atlanta, Georgia 30332.

3 Q. Have you ever had your deposition taken
4 before, Dr. Deutsch?

5 A. No.

6 Q. Have you talked to your attorney or to the
7 attorney for the Intervenorors about depositions in
8 general?

9 A. Yes.

10 Q. You know what a deposition is?

11 A. Yes.

12 Q. You know that you're responding to questions
13 under oath and that your responses are being transcribed
14 by the court reporter just as if you were testifying
15 before the Atomic Safety and Licensing Board?

16 A. Yes.

17 Q. Let me explain why I'm here. I'm basically
18 going to ask you some questions about your background
19 and about your testimony that you intend to give on
20 behalf of the Intervenorors in this proceeding, and I'm
21 not trying to trick or confuse you. If I ask you a
22 question that you don't understand, please stop me and
23 I'll try to restate the question.

24 Have you done anything to prepare for this
25 deposition?

1 A. No, I haven't.

2 Q. So you have not looked at any documents?

3 A. No. I have been out of town the last several
4 weeks before last week and have not done anything to
5 prepare for this.

6 Q. Are you married?

7 MR. FLACK: I object to that question and
8 all questions relating to the deponent's personal life
9 on the grounds that they are irrelevant to this
10 proceeding. We have no objections to any questions
11 about his professional associations, however.

12 Further, I instruct the witness not to answer
13 any questions about his personal life.

14 MR. DAVENPORT: For the purposes of this
15 deposition, may we take your instruction to him not to
16 answer as a refusal to answer?

17 MR. FLACK: Are you going to follow my
18 instructions?

19 THE WITNESS: Yes. I'm going to follow
20 my attorney's advice.

21 Q. (By Mr. Davenport) Dr. Deutsch, would you
22 please describe for me your education since high school.

23 A. I have a Bachelors in chemistry from Georgia
24 Institute of Technology and a Ph.D. in chemistry from
25 Georgia Institute of Technology.

1 Q. When did you receive the Bachelors degree?

2 A. 1962.

3 Q. When did you receive the Ph.D.?

4 A. 1967.

5 Q. You have not obtained a Masters degree
6 between those two degrees?

7 A. No.

8 Q. Did you specialize in or focus your studies
9 upon any particular areas?

10 A. Yes.

11 Q. What areas?

12 A. Organic chemistry.

13 Q. Did you write a dissertation?

14 A. Yes.

15 Q. On what subject?

16 A. First part on the structure of the antibiotic
17 flavensomycin and the second part Nuclear Magnetic
18 Resonance Studies of Non-Equivalent Methylene Protons.

19 Q. Dr. Deutsch, did you attend any schools from
20 which you did not graduate?

21 A. No.

22 Q. Within the area of organic chemistry, did you
23 further specialize in any subareas of the general area
24 of organic chemistry?

25 A. My interest has been in the general area of

1 natural products.

2 Q. What does that mean?

3 A. Organic compounds that are formed by natural
4 processes, life processes, either from plants or animals
5 as opposed to those that are strictly synthetic.

6 Q. Have you ever served in the military?

7 A. No.

8 Q. Have you ever been charged with a crime other
9 than traffic offenses?

10 A. No.

11 Q. By whom are you currently employed, Dr.
12 Deutsch?

13 A. Georgia Institute of Technology.

14 Q. What position do you hold?

15 A. Research Scientist II.

16 Q. How long have you held that position?

17 A. Five years.

18 Q. What are your duties in that position?

19 A. Research.

20 Q. Do you teach at all?

21 A. Occasionally; not a requirement of my
22 position.

23 Q. When you do teach, what sort of subjects do
24 you teach?

25 A. Organic chemistry.

1 Q. Would this be organic chemistry on an
2 undergraduate level?

3 A. Yes.

4 Q. Did you ever teach graduate level courses?

5 A. No.

6 Q. What sort of research do you do?

7 A. Currently I'm doing research on synthesis of
8 antitumor compounds.

9 Q. Can you explain briefly what is that involved
10 in that? Is it involved in some type of research?

11 A. The approach we're using is what I call lead
12 compounds, compounds with antitumor activity and
13 fine-tuning them to make them useful drugs.

14 Q. These are drugs that are designed to combat
15 tumors?

16 A. Yes.

17 Q. What other sort of research are you currently
18 engaged in?

19 A. That's my main research interest at this
20 particular time.

21 Q. Have you done research in other areas in the
22 past ten years?

23 A. Yes.

24 Q. What other areas?

25 A. Isolation of antiglaucoma compounds,

1 synthesis of numerous natural products, synthesis of
2 other antitumor agents unrelated to the present work.

3 Q. Do you report to anyone in your position as
4 Research Scientist II?

5 A. Yes.

6 Q. Who do you report to?

7 A. Can I consult my attorney?

8 MR. FLACK: Is this relevant to the --

9 MR. DAVENPORT: I'm trying to find out
10 about what the witness's background is.

11 MR. FLACK: I think he's told you about
12 his background.

13 MR. DAVENPORT: I think it's relevant.

14 MR. FLACK: We object on the basis of
15 relevancy. I instruct the witness not to answer.

16 MR. DAVENPORT: You're instructing an
17 expert witness not to answer questions concerning what
18 sort of work he does and who he reports to in doing that
19 work?

20 MR. FLACK: I'm not objecting to
21 describing what kind of work he does; I'm objecting as
22 to his identifying his supervisor in that I don't see
23 how it relates to this inquiry that we're here for
24 today. I instruct the witness not to answer.

25 MR. DAVENPORT: Mr. Flack, you're making

1 yourself the final arbiter of what's relevant in this
2 deposition?

3 MR. FLACK: I'm not. I don't believe I'm
4 the final arbiter. I believe I'm the threshold arbiter.

5 Q. (By Mr. Davenport) Do you supervise anyone,
6 Dr. Deutsch?

7 MR. FLACK: I object on the same basis.

8 Q. (By Mr. Davenport) Do you have tenure, Dr.
9 Deutsch?

10 A. No.

11 Q. How long have you been employed by Georgia
12 Tech, Dr. Deutsch?

13 A. Approximately nine years.

14 Q. What position have you held prior to the
15 position of Research Scientist II?

16 A. Postdoctoral fellow, Research Scientist I,
17 grade one.

18 Q. What were your duties as a Research Scientist
19 Grade I?

20 A. Very similar to my current with less
21 supervisory capacity.

22 Q. Essentially you performed independent
23 research?

24 A. Yes.

25 Q. Are the subjects that you research dictated

1 in any way or are you free to pick your own subjects?

2 A. I'm free to pick my own subjects.

3 Q. As a postdoctoral fellow, what sort of duties
4 did you perform?

5 A. Research.

6 Q. Do you do any teaching in either of those
7 positions?

8 A. Yes.

9 Q. As a Research Scientist II, can you describe
10 for me how the Georgia Tech research program is
11 structured?

12 MR. FALCK: I object to that question on
13 the basis that has nothing to do with this inquiry that
14 we're here today on. I instruct the witness not to
15 answer.

16 MR. DAVENPORT: You're saying the
17 structure of the research program in which this witness
18 works is not relevant to his background?

19 MR. FLACK: That is correct.

20 Q. (By Mr. Davenport) How long did you hold the
21 position of Research Scientist I?

22 A. Approximately two to three years.

23 Q. That would have been approximately 1977 to
24 1980?

25 A. Yes.

1 Q. Since 1980 you have been a Research Scientist
2 II, is that correct?

3 A. Yes.

4 Q. How many years were you a postdoctoral
5 fellow?

6 A. Between one and two years.

7 Q. Do you recall what year you first became
8 employed by Georgia Tech?

9 A. 1975.

10 Q. By whom were you employed before you became
11 employed by Georgia Tech?

12 A. Union Camp Corporation.

13 Q. What position did you hold with Union Camp?

14 A. Research scientist -- research chemist I
15 believe it is.

16 Q. Was this in Savannah?

17 A. No.

18 Q. Where was it?

19 A. Princeton, New Jersey.

20 Q. What were your duties as a research chemist
21 for Union Camp?

22 A. Conduct research on designated products.

23 Q. What sort of products did you do research on?

24 A. Pulp, bleaching of wood pulp, isolation of
25 organic chemicals from pine trees.

1 Q. What period of time were you employed by
2 Union Camp?

3 A. 1967 to 1974.

4 Q. Had you been employed by anyone other than
5 Union Camp or Georgia Tech since you received your
6 Ph.D.?

7 A. No.

8 Q. Did you hold any other position with Union
9 Camp other than research chemist?

10 A. No.

11 Q. By whom were you employed prior to becoming
12 employed by Union Camp?

13 A. When I was not in school or --

14 Q. Let me ask you a different way. Were you in
15 school continuously between 1962 and 1967 when you
16 received your Ph.D.?

17 A. Yes.

18 Q. Why did you leave Union Camp to come to
19 Georgia Tech?

20 A. I was dissatisfied with the research I was
21 doing and wanted to move on to more interesting areas.

22 Q. Did you leave Union Camp voluntarily?

23 A. Yes.

24 Q. Dr. Deutsch, what is your relationship with
25 Campaign for a Prosperous Georgia?

1 A. What is my relationship? Can you clarify
2 that? What does relationship mean?

3 C. Do you have any relationship with Campaign
4 for A Prosperous Georgia?

5 A. I'm a member of that organization.

6 C. Do you hold any office in Campaign for a
7 Prosperous Georgia?

8 A. I'm vice-president of the board of directors.

9 C. What are your duties as vice-president of the
10 board of directors?

11 A. Board of directors was just formulated in
12 January, that's when the elections were held. We
13 haven't had another meeting since then, so we're
14 formulating duties at this time.

15 C. Are you a member of the Board of directors?

16 A. I assume that the vice-president would be.

17 C. I guess I'm unclear based on your response
18 whether you are a vice-president for Campaign for a
19 Prosperous Georgia?

20 A. Of the board of directors.

21 C. Is that an elected position?

22 A. Yes.

23 C. Do you participate in any of the functions or
24 activities for Campaign for a Prosperous Georgia?

25 A. As a member I do, yes.

1 Q. What sort of activities do you participate
2 in?

3 A. I'm interested in much of what they do. I'm
4 involved in the current process of licensing of Plant
5 Vogtle.

6 Q. Are you involved in any other activities?

7 A. Not currently.

8 Q. When did you become associated with Campaign
9 for a Prosperous Georgia?

10 A. I would say about in January of 1984.

11 Q. Do you have any relationship with Educational
12 Campaign for a Prosperous Georgia?

13 A. No.

14 Q. Do you know anything about Educational
15 Campaign for a Prosperous Georgia?

16 MR. FLACK: I object on the basis of
17 relevancy. Educational Campaign for a Prosperous
18 Georgia has nothing to do with this proceeding or this
19 witness's expertise. I instruct the witness not to
20 answer.

21 MR. DAVENPORT: So basically you would
22 instruct him not to answer any questions concerning
23 Educational Campaign for a Prosperous Georgia?

24 MR. FLACK: That's correct.

25 Q. (By Mr. Davenport) Dr. Deutsch, what is your

1 relationship with Georgians Against Nuclear Energy?

2 MR. FLACK: I make the same objection and
3 the --

4 MR. DAVENPORT: They're a party to this
5 proceeding.

6 MR. FLACK: I withdraw the objection.

7 Q. (By Mr. Davenport) Dr. Deutsch, what is your
8 relationship Georgians Against Nuclear Energy?

9 A. I'm a member of that organization.

10 Q. How long have you been a member?

11 A. I don't really recall, several years at
12 least.

13 Q. Do you hold any position with Campaign for --
14 I mean Georgians Against Nuclear Energy?

15 A. No.

16 Q. Do you know how Georgians Against Nuclear
17 Energy is organized?

18 A. No.

19 Q. Do you participate in any of the functions of
20 Georgians Against Nuclear Energy?

21 A. Yes, I have gone to meetings.

22 Q. What sort of functions or activities by
23 Georgians against Nuclear Energy have you participated
24 in?

25 A. On an irregular basis they have meetings

1 which I go to.

2 Q. But you're not involved in any other
3 activities other than simply attending meetings?

4 A. Other than how they may be involved in any of
5 this proceeding of --

6 Q. You're talking about the Vogtle licensing
7 proceeding?

8 A. Vogtle licensing proceeding.

9 Q. Dr. Deutsch, were you involved at all in the
10 formation of Campaign for a Prosperous Georgia?

11 A. No.

12 Q. I believe you testified that you became a
13 member of Campaign for a Prosperous Georgia in early
14 1984?

15 A. I believe that's the date. I'm not clear
16 that I can say it's some exact date when I became a
17 member. That's about the time I became involved I'd
18 say.

19 Q. Were you a member at the time Campaign for a
20 Prosperous Georgia filed its petition seeking to
21 intervene in the Plant Vogtle licensing proceeding?

22 A. I don't believe so.

23 Q. Does Campaign for a Prosperous Georgia still
24 have members today?

25 MR. FLACK: Clarify what you mean by

1 members.

2 Q. (By Mr. Davenport) Dr. Deutsch, you've
3 testified I believe that you are currently a member of
4 Campaign for a Prosperous Georgia.

5 A. Mm-hmm. Yes.

6 Q. What does it mean to be a member of Campaign
7 for a Prosperous Georgia? How did you become a member?

8 MR. FLACK: You mean in his mind
9 personally?

10 MR. DAVENPORT: Yes.

11 THE WITNESS: Not speaking for them, I
12 would say you would write to the organization, express
13 your interest and probably make a contribution or not,
14 then you would be a member.

15 Q. (By Mr. Davenport) You are aware that
16 Campaign for a Prosperous Georgia is incorporated; are
17 you not?

18 A. Yes.

19 Q. Do you know whether the bylaws for Campaign
20 for a Prosperous Georgia have any provisions concerning
21 what constitutes membership?

22 A. No.

23 Q. You're not aware?

24 A. I do not know.

25 Q. How is Campaign for a Prosperous Georgia

1 financed?

2 MR. FLACK: I object to that question.

3 MR. DAVENPORT: On what grounds?

4 MR. FLACK: On the grounds of relevancy.

5 MR. DAVENPORT: Are you instructing him
6 not to answer?

7 MR. FLACK: I am.

8 Q. (Ey Mr. Davenport) What is the total
9 operating budget for Campaign for a Prosperous Georgia
10 for 1985, Dr. Deutsch?

11 MR. FLACK: I make the same objection and
12 the same instruction.

13 Q. (Py Mr. Davenport) Dr. Deutsch, were you
14 involved at all in the formation of Educational Campaign
15 for a Prosperous Georgia?

16 MR. FLACK: I make the same objection and
17 the same instruction.

18 Q. (Ey Mr. Davenport) Dr. Deutsch, are you
19 familiar at all with the activities of Educational
20 Campaign for a Prosperous Georgia?

21 MR. FLACK: I make the same objection and
22 the same instruction.

23 Q. (Py Mr. Devenport) Dr. Deutsch, were you
24 involved at all in the formation of Georgians Against
25 Nuclear Energy?

1 A. No.

2 Q. Do you know when that organization was
3 formed?

4 A. No.

5 Q. Do you know if that organization is
6 incorporated?

7 A. I do not know.

8 Q. Dr. Deutsch, have you served on any advisory
9 panel or committee that have addressed any issues
10 concerning nuclear facilities or public utilities?

11 A. No.

12 Q. Have you authored any articles on the public
13 utility industry in general or on any subjects relating
14 to nuclear facilities?

15 A. No.

16 Q. Have you ever appeared as a witness in any
17 proceeding before a court or administrative agency?

18 A. No.

19 Q. Have you ever appeared as a witness in any
20 proceeding held under the auspices of the Nuclear
21 Regulatory Commission?

22 A. No.

23 Q. Have you ever appeared as a witness before a
24 state public service commission or any other body
25 regulating utilities?

1 A. No.

2 Q. Have you ever appeared as a witness in any
3 other type of proceeding of any kind relating to a
4 nuclear facility?

5 A. No.

6 Q. Have you ever provided any person, any group
7 or any organization an affidavit for use in a proceeding
8 relating to a nuclear facility other than this
9 proceeding?

10 A. No.

11 Q. Have you ever submitted written comments to a
12 nuclear regulatory commission, the Department of
13 Energy, or any other federal agency concerning a
14 nuclear facility?

15 A. I have participated in the formulation of our
16 responses to the interrogatories and the various
17 documents that have been submitted.

18 Q. In this proceeding?

19 A. In this proceeding.

20 Q. In any other proceeding?

21 A. No.

22 Q. In this proceeding did you participate in the
23 formulation of the comments submitted by Campaign for a
24 Prosperous Georgia to the Nuclear Regulatory Commission
25 on the draft environmental statement?

1 A. No.

2 Q. Have you ever provided any assistance to any
3 party for any type of proceeding involving nuclear
4 energy or a nuclear facility other than this proceeding?

5 A. No.

6 Q. Are you a member of any professional
7 organizations, Dr. Deutsch?

8 A. Yes.

9 Q. What organizations?

10 A. American Chemical Society and the American
11 Society of Pharmacognosy.

12 Q. Can you spell that last word for the court
13 reporter?

14 A. I'll write it.

15 Q. Are you a member of the American Chemical
16 Society, Dr. Deutsch?

17 A. Yes.

18 Q. Do you hold any other position with the
19 American Chemical Society other than the membership?

20 A. No.

21 Q. What sort of activities does the American
22 Chemical Society engage in?

23 A. Scholarly activities related to the field of
24 chemistry.

25 Q. What is the nature of your involvement in the

1 activities of that organization?

2 A. I'm not sure what you mean exactly.

3 Q. Let me restate the question. I'm trying to
4 ask whether you yourself are involved in any activities
5 of the American Chemical Society other than just the
6 fact that you are a member?

7 A. No.

8 Q. What sort of activities does the American
9 Society of Pharmacognosy engage in?

10 A. Again, it would be scholarly activities
11 related to that field, which is the use of natural
12 products as pharmaceuticals?

13 Q. Is that pharmacology?

14 A. Pharmacognisyl.

15 Q. Pharmacognisyl?

16 A. Pharmacognisyl.

17 Q. How long have you been a member of the
18 American Chemical Society?

19 A. Approximately since 1962.

20 Q. How long have you been a member of the
21 American Society of Pharmacognosyl?

22 A. Approximately since 1975.

23 Q. Are you involved in any way in the activities
24 of the American Society of Pharmacognosyl other than the
25 fact that you are a member?

1 A. No.

2 Q. With respect to either organization, do you
3 attend annual meetings or anything like that?

4 A. On an irregular basis, but I do attend their
5 meetings.

6 Q. What nonprofessional organizations are you a
7 member of?

8 MR. FLACK: I object to that question on
9 the basis of relevancy, and I instruct the witness not
10 to answer.

11 MR. DAVENPORT: So your position is that
12 organizations which this witness is member of, in a
13 nonprofessional organization, isn't relevant to his
14 testimony?

15 MR. FLACK: That's correct.

16 Q. (By Mr. Devenport) Dr. Deutsch, have you or
17 Campaign for a Prosperous Georgia, to your knowledge,
18 received assistance from the Environmental Action
19 Foundation with respect to this proceeding?

20 A. Not to my knowledge.

21 Q. Are you a member of the Environmental Action
22 Foundation?

23 A. No.

24 Q. Have you or Campaign for a Prosperous Georgia
25 received assistance from Educational Campaign for a

1 Prosperous Georgia with respect to this proceeding?

2 MR. FLACK: I object on the same basis as
3 earlier regarding Educational Campaign.

4 MR. DAVENPORT: What is the basis?

5 MR. FLACK: That it was not relevant.

6 MR. DAVENPORT: Assistance that Campaign
7 for a Prosperous Georgia has received from Educational
8 Campaign for a Prosperous Georgia is not relevant to
9 this proceeding? That's your position?

10 MR. FLACK: That's correct.

11 Q. (By Mr. Davenport) Dr. Deutsch, have you or
12 Campaign for a Prosperous Georgia received assistance
13 from the Southern Regional Council with respect to this
14 proceeding?

15 MR. FLACK: I object on the same basis
16 with the same instruction.

17 MR. DAVENPORT: The instruction was not
18 to answer the question?

19 MR. FLACK: That is correct.

20 Q. (By Mr. Davenport) Dr. Deutsch, have you
21 received any assistance from the Union of Concerned
22 Scientists with respect to this proceeding?

23 MR. FLACK: I object on the same basis
24 and the same instruction.

25 MR. DAVENPORT: You're saying that

1 assistance that the witness received with respect to
2 this proceeding is not relevant to his testimony?

3 MR. FLACK: I think that that is correct.

4 MR. DAVENPORT: I would remind Mr. Flack
5 that Mr. Johnson testified in his deposition that Dr.
6 Deutsch had received assistance from the Union of
7 Concerned Scientists. I'm simply inquiring into the
8 nature of that assistance.

9 MR. FLACK: I understand Mr. Johnson's
10 testimony. I was there.

11 Q. (By Mr. Davenport) Dr. Deutsch, have you
12 received any assistance from the or information from the
13 Nuclear Information and Resource Service with respect to
14 this proceeding?

15 MR. FLACK: I make the same objection and
16 the same instruction.

17 Q. (By Mr. Davenport) Dr. Deutsch, have you
18 received any information from the Union of Concerned
19 Scientists with respect to this proceeding?

20 MR. FLACK: I make the same objection and
21 the same instruction.

22 Q. (By Mr. Davenport) Dr. Deutsch, have you
23 received assistance from the Critical Mass Energy
24 Project with respect to this proceeding?

25 MR. FLACK: I make the same objection and

1 the same instruction.

2 MR. DAVENPORT: I assume you would also
3 object with respect to Coastal Citizens For a Clean
4 Environment and --

5 MR. FLACK: Yes. If you want to list --

6 MR. DAVENPORT: I would assume you would
7 object to a question with respect to who else he's
8 received assistance or information from with respect to
9 this proceeding?

10 MR. FLACK: That's correct.

11 Q. (By Mr. Davenport) Dr. Deutsch, have you
12 been paid by either of the Interveners, that is,
13 Campaign for a Prosperous Georgia or Georgians Against
14 Nuclear Energy to participate in the Plant Vogtle
15 licensing proceeding?

16 A. No.

17 Q. Have you appeared previously as a witness on
18 behalf of either of those organizations in any other
19 proceeding?

20 A. No.

21 Q. Have you provided any information in this
22 proceeding to the Interveners for their use in supplying
23 the bases for any contention admitted by the Atomic
24 Safety and Licensing Board?

25 A. Repeat the question.

1 Q. Dr. Deutsch, have you provided any
2 information to the Interveners in this proceeding for
3 their use in supplying the bases for any of the
4 contentions admitted by the Atomic Safety and Licensing
5 Board?

6 A. Supplied means my own personal knowledge or
7 knowledge that's generally available through published
8 articles?

9 Q. First I'm asking for just whether you have
10 provided them any information at all, regardless of the
11 source.

12 A. Yes.

13 Q. Have you provided them any information that
14 comes from your own personal knowledge as opposed to
15 generally available literature?

16 A. No.

17 Q. Which contentions have you provided
18 information to the Interveners about?

19 A. Contentions 10, 11 and 12.

20 Q. What subject matters have you provided
21 information about?

22 A. I don't know how to respond to that question.
23 Subject matters?

24 Q. Let me break it down. Contention 12, with
25 respect to Contention 12, which addresses Salt drift and

1 chlorine emissions from the cooling towers, what subject
2 matters have you provided information to the Intervenor
3 about relevant to that contention?

4 MR. FLACK: Hugh, excuse me. Do you have
5 a copy of the contention? That might give him a better
6 way to break that down.

7 MR. DAVENPORT: No, I don't.

8 MR. FLACK: Do you have any objection to
9 him looking at a copy of the contention?

10 MR. DAVENPORT: If you have one. Let the
11 record note that the witness is conferring with his
12 attorney.

13 MR. FLACK: Witness has advised it would
14 not be helpful, so why don't you just go on.

15 THE WITNESS: I don't know. I still
16 don't know how to answer in terms of subject matters,
17 but I basically provided the information that is in that
18 contention.

19 Q. (By Mr. Davenport) With respect to
20 Contention 11, did you also provide the information used
21 by the Intervenor in setting out the basis for that
22 contention?

23 A. Yes.

24 Q. With respect to Contention 10, specifically
25 subcontention 10.1, concerning the dose rate effect and

1 10.3 concerning the multiconductor effect and 10.5
2 concerning the solenoid valves, 10.7 concerning hydrogen
3 recombiners, did you provide the information used by the
4 Intervenor for establishing a basis for those
5 contentions?

6 A. Just to clarify, that's the subcontentions,
7 subparts of that contention that were admitted?

8 Q. Yes.

9 A. Yes, I did.

10 Q. Did you also provide the Intervenor with the
11 information used in responding to the Applicants'
12 interrogatories concerning each of those contentions?

13 A. I did supply information.

14 Q. Do you know whether the interrogatory
15 responses that related to those contentions contained
16 information from sources other than you?

17 A. I believe so.

18 Q. Dr. Deutsch, what subject matters do you
19 consider yourself to be an expert about?

20 A. Those related to chemistry.

21 Q. This is based upon your degrees in chemistry
22 and your research in the area of organic chemistry, I
23 guess?

24 A. And all of my work in chemistry, yes.

25 Q. I believe you answered earlier that you had

1 not authored any papers or articles that have been
2 published?

3 A. No, that was not asked of me.

4 Q. Let me ask, have you authored any papers,
5 studies, treatises or articles?

6 A. Yes.

7 Q. Can you give me the titles?

8 A. I don't recall all of the titles.

9 MR. FLACK: Give him what you can recall.

10 THE WITNESS: I have about 30
11 publications. The latest one might be the structure of
12 a derivative -- the suprastructure derivative of the
13 mytenamid -- --

14 MR. DAVENPORT: This might speed things
15 up. If you are willing to agree to provide us with a
16 list, I'm sure you have a curriculum vitae, that lists
17 most if not all of your articles, we will accept that.

18 MR. FLACK: We'll be glad to provide
19 that. I have no objection. I assume, Laurie, is that
20 true?

21 MS. FOWLER: That's fine.

22 Q. (By Mr. Davenport) Have any of the papers,
23 studies --

24 MR. FLACK: Excuse me. For the record,
25 if you don't get it within two weeks, why don't you drop

1 us a letter to remind us.

2 Q. (By Mr. Davenport) Dr. Deutsch, have any of
3 the papers, studies, treatises or articles that you have
4 authored concerned any of the issues raised by the
5 contentions admitted by the Atomic Safety and Licensing
6 Board in this proceeding?

7 A. I'm sorry. I didn't hear the question.

8 (Whereupon, the court reporter read
9 back the previous question.)

10 THE WITNESS: I have no studies directly
11 related to any of those questions.

12 Q. (By Mr. Davenport) Have you been involved in
13 any studies indirectly related?

14 A. I believe so, but.

15 Q. What sort of subject matter was being
16 studied?

17 A. This was in relationship to bleaching of
18 paper pulp, which the system was chlorine based
19 chemicals.

20 Q. Which contention would that be relevant to in
21 your mind?

22 A. Contention 12.

23 Q. Any other research that you have been
24 involved in that you can recall that would be relevant
25 to the issues raised by the relevant contentions?

1 A. No.

2 Q. Dr. Deutsch, do you consider yourself an
3 opponent of nuclear power?

4 A. Sort of a difficult thing to answer in one
5 simple way, but I believe there are better alternatives
6 to energy production.

7 Q. Better alternatives than nuclear generating
8 plants?

9 A. Yes.

10 Q. Are you opposed to licensing of nuclear
11 generating plants?

12 A. You mean beyond this particular proceeding
13 that we're here for?

14 Q. In general?

15 A. In general if a plant is -- if I thought a
16 plant could be safely operated, I don't think it would
17 be satisfactory to license it.

18 Q. Under the current state of technology do you
19 believe that a nuclear generating facility can be safely
20 operated?

21 A. Again, I think this is a very difficult
22 question to answer and depends on what the definition of
23 safety is. I would say that it would be, in my mind, it
24 would be difficult to operate any nuclear plant safely
25 when you view --

1 Q. Do you feel that nuclear generating plants
2 that have been licensed and are currently operating
3 should have their license withdrawn?

4 MR. FLACK: You mean if he's
5 investigating these different plants?

6 MR. DAVENPORT: I'm asking for his
7 opinion.

8 THE WITNESS: I would want to look at
9 each one on a case by case basis.

10 Q. (By Mr. Davenport) Do you feel that Plant
11 Vogtle should not be granted an operating license by the
12 Nuclear Regulating Commission?

13 A. If I had preference, if I identify components
14 of that plant that I feel are unsafe to the environment,
15 then I don't think they should be licensed.

16 Q. I'm talking specifically about Plant Vogtle.

17 A. That's what my answer was in reference to,
18 Plant Vogtle.

19 Q. Based upon your information of Plant Vogtle,
20 are you aware of any reasons that make you feel that it
21 should not be granted an operating license by the
22 Nuclear Regulating Commission?

23 MR. FLACK: I think he just answered it.

24 THE WITNESS: I did answer that.

25 Q. (By Mr. Davenport) Dr. Deutsch, are you

1 aware of any reasons that -- let me restate that. Dr.
2 Deutsch, with respect to Plant Vogtle, based on your
3 knowledge of that plant at this time, do you feel that
4 Plant Vogtle should not be granted an operating license
5 by the Nuclear Regulatory Commission?

6 A. Based on what I've discovered and looked at
7 so far and if new information comes in, I feel there's a
8 possibility that plant would not be safe based on the
9 information that I've looked at.

10 Q. So you feel it should not be granted an
11 operating license?

12 A. Until it can be operating safely it shouldn't
13 be.

14 Q. What reasons or what are your reasons for
15 thinking it can't be operated safely?

16 A. Those have been stated in our contentions.

17 Q. I'm asking you now to state them under oath.

18 A. I can't recall all of the reasons that are
19 already in writing that we already have given to you.

20 Q. Tell me.

21 A. It would be a futile effort to try to repeat
22 all of those contentions and responses that have gone
23 back and forth that are already in the record.

24 Q. Dr. Deutsch, I'm asking you based upon your
25 knowledge at this time what reasons you have for

1 thinking Plant Vogtle cannot be safely operated? He
2 says he can't recall all of them.

3 I'm asking which ones he can recall, Mr.
4 Flack. If he says none.

5 MR. FLACK: I didn't understand what you
6 were limiting it to.

7 THE WITNESS: What I can recall at this
8 time is the use of unqualified equipment, such as
9 certain valves, the use of unqualified hydrogen
10 combiners, the possible environmental effects of salt
11 drift and chlorine emission, possibility of accidents
12 related to the steam generating system.

13 Q. (By Mr. Davenport) When you say accidents
14 related to the steam generating system, are you talking
15 about tube ruptures?

16 A. Yes.

17 Q. Anything other than tube ruptures?

18 A. Yes. Do you want me to call them off?

19 Q. Was there anything else that you can
20 remember?

21 A. Basically, that's what I can remember. I
22 haven't reviewed any of this materials. I haven't
23 looked at anything in nearly a month, been out of town
24 and concerned with other matters at this time.

25 Q. You have been identified by the joint

1 Intervenor in this proceeding as someone who may
2 testify as a witness on their behalf in the hearing
3 before the Atomic Safety and Licensing Board. Have you
4 been asked to appear as a witness before that board on
5 behalf of the intervenors?

6 A. Yes.

7 Q. Have you agreed to do so?

8 A. Yes.

9 Q. Are you familiar with the contentions
10 admitted by the Atomic Safety and Licensing Board in
11 this proceeding?

12 A. Familiar, yes.

13 Q. Do you intend to testify about any issues
14 raised by Contention 7 concerning groundwater
15 contamination?

16 A. No.

17 Q. About Contention 10.1, the dose rate effect?

18 A. No.

19 Q. You do not intend to testify about any issues
20 relating to the Contention 10.1, the dose rate effect?

21 A. Didn't I just answer it?

22 MR. FLACK: I think he answered he was no
23 intention of testifying.

24 MR. DAVENPORT: It's contrary to what I
25 understood before.

1 THE WITNESS: I said no.

2 Q. (By Mr. Davenport) You're not going to?

3 A. Yes, I am not going to testify.

4 Q. Are you going to testify about any issues
5 raised by Contention 10.3, concerning the multiconductor
6 effect?

7 A. No.

8 Q. Are you going to testify about any issues
9 raised by Contention 10.5, concerning ASCO solenoid
10 valves?

11 A. We are talking about only as an expert
12 witness in these areas?

13 Q. Or as a witness at all.

14 A. Let me consult with my attorney for a minute.

15 MR. DAVENPORT: Can you let the record
16 reflect the witness is consulting with his attorney.
17 Ready to to proceed?

18 THE WITNESS: I still didn't hear the
19 last question.

20 MR. DAVENPORT: Let me start over.

21 Q. (By Mr. Davenport) Dr. Deutsch, do you
22 intend to testify as an expert witness with regard to
23 any contention admitted by the Licensing Board in this
24 proceeding?

25 A. Yes.

1 Q. Which contentions?

2 A. 12.

3 Q. Contention 12 is the only, am I correct,
4 Contention 12 is the only contention about which you
5 intend to testify as an expert?

6 A. Yes.

7 Q. With respect to any of the other admitted
8 contentions, do you intend to testify as a non-expert?

9 MS. FOWLER: Hugh, at this time we do not
10 expect to call Howard. We haven't formulated who we're
11 going to call on environmental qualifications. We don't --

12 MR. DAVENPORT: What about steam
13 generators?

14 MR. FOWLER: Or steam generators. At
15 this time we don't expect to call Howard.

16 MR. DAVENPORT: So right now the only
17 contention on which you expect to use Dr. Deutsch as a
18 witness is Contention 12?

19 MS. FOWLER: Right.

20 Q. (By Mr. Davenport) Dr. Deutsch, what aspect
21 of your educational background, training or experience
22 in your opinion qualifies you to testify as an expert
23 about the issues raised by Contention 12?

24 A. My degrees in chemistry and some of my
25 research that I've done.

1 Q. What research specifically?

2 A. The use of chlorine based chemicals in
3 industrial practice.

4 Q. Anything else?

5 A. No.

6 Q. That was research performed while you were
7 employed with Union Carbide?

8 A. Correct.

9 Q. Dr. Deutsch, have you ever studied or done
10 any research on geology or hydrogeology?

11 A. No.

12 Q. You have not had any training in geology or
13 hydrogeology?

14 A. No.

15 Q. I assume you do not consider yourself
16 knowledgeable about geology or hydrogeology; is that
17 correct?

18 A. You mean as an expert?

19 Q. Just knowledgeable in general.

20 A. I don't know how to answer that question.

21 Q. Do you know anything about geology or
22 hydrogeology?

23 A. Sure.

24 Q. What sort of training, educational experience
25 and background do you have in geology or hydrogeology?

1 A. You just asked me. I said I had none.

2 Q. What is the basis for that statement that you
3 have some knowledge about geology or hydrogeology?

4 A. I know things about geology.

5 Q. Are you familiar at all with the geologic
6 formulation and hydrologic formation at Plant Vogtle?

7 A. No.

8 Q. Dr. Deutsch, have you ever studied about or
9 done any research on the effects upon polymer materials
10 from radiation?

11 A. No.

12 Q. Do you consider yourself knowledgeable about
13 the effect of radiation on polymer materials?

14 A. In a general way I have some knowledge of
15 this area.

16 Q. What is that general knowledge based on?

17 A. Studies that I have read concerning the
18 effect of radiation on polymers.

19 Q. What specific studies?

20 A. Those have all been cited in the
21 interrogatories.

22 Q. Any studies other than those cited in the
23 interrogatory responses?

24 A. I don't recall.

25 Q. Are you or have you ever reviewed the report

1 prepared by Sandia National Laboratories entitled
2 Occurrence and Implications of Radiation Dose Rate
3 Effects from Material Agent Studies?

4 A. I believe I have read that report. I don't
5 remember specifically the title of all the articles that
6 I've read. It sounds familiar.

7 Q. Did you know what specific polymers the
8 intervenors contend are susceptible to a dose rate
9 effect in this proceeding?

10 A. I know that PVC is implicated. I don't know
11 for sure if any of the others are.

12 Q. What is the basis of your knowledge about
13 PVC?

14 A. That's been identified in a study that I've
15 read as a polymer that's susceptible to these effects.

16 Q. Was that a Sandia study?

17 A. Yes, it was.

18 Q. Do you have any knowledge concerning what
19 safety-related material or equipment at Plant Vogtle
20 contains PVC?

21 MR. PLACE: Question was does he have any
22 knowledge?

23 MR. DAVENPORT: Yes.

24 THE WITNESS: We have received a response
25 from the company identifying all polymers and

1 safety-related equipment. I have not reviewed that
2 response.

3 Q. (By Mr. Davenport) Other than that document
4 that you're referring to that you received from the
5 company, do you have any other knowledge concerning what
6 safety-related material or equipment at Plant Vogtle
7 contains PVC?

8 A. No.

9 Q. Do you know what dose rates were used in the
10 qualification testing of any equipment or material at
11 Plant Vogtle that contains PVC?

12 A. No, I don't.

13 Q. Do you know at what total integrated dose a
14 dose rate effect becomes discernible for PVC?

15 A. No, I don't.

16 Q. Are you aware of any instance in which
17 material containing PVC has been found to be degraded
18 in any operating nuclear facility before the expiration
19 of its expected life as a result of exposure to
20 radiation under normal conditions?

21 A. No.

22 Q. Do you know whether PVC or any of the other
23 polymeric materials tested by Sandia National
24 Laboratories suffered a significant loss of mechanical
25 properties at a total degraded dose of ten mega rads

1 or less?

2 A. No.

3 Q. Do you have any knowledge concerning the
4 range of dose rates used in the studies performed by
5 Sandia National Laboratories?

6 A. No, I don't recall any of those.

7 Q. Dr. Deutsch, have you ever studied or done
8 any research on the effect of radiation on electrical
9 cable?

10 A. No.

11 Q. Did you consider yourself knowledgeable about
12 the effects of radiation on electrical cable?

13 MR. FLACK: You mean more than a layman
14 would have?

15 THE WITNESS: I have read things about
16 it.

17 Q. (By Mr. Davenport) What have you read?

18 A. The studies that we cited in the contentions
19 and interrogatories.

20 Q. Do you recall the names of any of the
21 specific cites?

22 A. No, I don't.

23 Q. Do you recall if those were all studies
24 performed by Sandia National Laboratories?

25 A. I believe they are.

1 Q. Do you have any knowledge concerning which
2 multiconductors have performed substantially worse in
3 qualification testing than the corresponding single
4 conductor?

5 A. I don't recall.

6 Q. Did you recall whether you have reviewed the
7 report published by Sandia National Laboratories
8 entitled the Effect of Mechanical Simulation Procedures
9 on ethylene, polyethylene rubber?

10 A. I believe that's the study that I have read.

11 Q. Are you aware of any other study or studies
12 that deal with what's called the multiconductor effect?

13 A. I don't recall any other.

14 Q. Do you know whether in this proceeding the
15 intervenors contend that any EPR cable material, other
16 than a multiconductor cable manufactured by Anaconda
17 Wire and Cable Company has performed substantially worse
18 in a multiconductor configuration than a corresponding
19 single configuration?

20 A. I have no knowledge of any other conductor.

21 Q. To your knowledge, Dr. Deutsch, has any cable
22 material with EPR insulation that did not also have a
23 chlorinated polyethylene jacket perform worse in a
24 multiconductor configuration than a single conductor
25 configuration?

1 A. Not to my knowledge.

2 Q. Fr. Deutsch, have you ever studied about or
3 done any research on the environmental qualification
4 testing of equipment?

5 A. No.

6 Q. Do you consider yourself knowledgeable about
7 the environmental qualification testing of equipment?

8 A. I have read various reports and papers that
9 we've submitted in our various interrogatories.

10 Q. Have you actually read the reports or read
11 summaries or reports of the reports?

12 A. Both.

13 Q. What specific reports on environmental
14 qualification testing have you read?

15 A. I don't recall at this time.

16 Q. Have you read any qualification reports
17 concerning ASCO solenoid baths?

18 A. I believe that such a report was furnished by
19 a company to us, and I don't recall the name of it. I
20 have look at that literature that was supplied to us by
21 the company.

22 Q. So if the company did supply you with a
23 report concerning qualification or cost, you have read
24 it?

25 A. I have looked at it.

1 Q. Is it your contention that solenoid valves
2 manufactured by Automatic Switch Company used at Plant
3 Vogtle are not environmentally qualified? I would point
4 out that Automatic Switch Company is commonly referred
5 to as ASCO.

6 A. Can you repeat the question.

7 Q. Dr. Deutsch, is it your contention that
8 solenoid valves manufactured by Automatic Switch Company
9 used at Plant Vogtle were not environmentally qualified?

10 A. I have read information that would lead me to
11 believe that.

12 Q. What information are you referring to?

13 A. Well, the information that was detailed in
14 our interrogatories concerning this problem.

15 Q. Are you aware of any information that would
16 support such a contention other than the information
17 cited in the Intervenor's interrogatory responses?

18 A. I'm not aware of that, no.

19 Q. Do you know which specific model ASCO valves
20 the Intervenor are contending are not environmentally
21 qualified?

22 A. I don't know the specific model numbers.

23 Q. Do you or is it your contention that solenoid
24 valves used at Plant Vogtle manufactured by any company
25 other than Automatic Switch Company are not

1 environmentally qualified?

2 A. At this time I don't have any knowledge of
3 other manufacturers of --

4 Q. Are you familiar with the nuclear regulatory
5 study dated November 1983, entitled Test Program and
6 Failure Analysis Class I-E Solenoid Valves, which
7 documents the test performed by Franklin Research
8 Center?

9 A. I don't recall reading that study.

10 Q. Do you recall ever seeing a report prepared
11 by Franklin Research Center concerning the test that it
12 performed on solenoid valves?

13 A. I don't recall reading that report.

14 Q. Do you know which model ASCO valves failed in
15 the Franklin Research Center test?

16 A. No, I don't.

17 Q. Do you know the conditions under which
18 Franklin Research Center tested ASCO solenoid valves?

19 A. I don't recall the precise conditions of
20 temperature and steam.

21 Q. Do you recall anything about the conditions?

22 A. Well, except that they are accelerated
23 testing at high temperature and conditions of humidity,
24 but I don't recall the exact conditions.

25 Q. Have you ever reviewed any document that set

1 out the exact conditions under which the valves were
2 tested?

3 A. Yes.

4 Q. What document?

5 A. I don't recall what the name of the document
6 was. Did specify what the conditions were, though.

7 Q. Do you contend that the equipment
8 qualification tests performed by ASCO are not valid?
9 I'm referring specifically to the qualification test
10 performed in 1973 and 1979 performed by ASCO.

11 A. I have no reason to think the tests are
12 invalid.

13 Q. Did you contend that any research or test
14 other than those performed by Franklin Research Center
15 called into question the valves used at Plant Vogtle?

16 A. Can you repeat the question?

17 A. Dr. Deutsch, do you contend that any research
18 test other than those performed by Franklin Research
19 Center called into question the qualification of ASCO
20 valves used at Plant Vogtle?

21 A. I believe that Westinghouse tested some of
22 those valves internally, but I'm not -- I don't recall
23 the exact nature of their tests or where that
24 information is summarized.

25 Q. Do you recall whether any of the valves

1 failed under the conditions that they were tested in the
2 Westinghouse test?

3 A. Best of my knowledge there are some failures.

4 Q. In the Westinghouse test?

5 A. Yes.

6 Q. Do you know the conditions the valves were
7 exposed to?

8 A. I don't recall.

9 Q. Dr. Deutsch, do you contend that the
10 Westinghouse Model B hydrogen recombiners used at Plant
11 Vogtle have not been properly environmentally qualified?

12 A. Yes.

13 Q. What is the basis for that contention?

14 A. That the unit has not been qualified as a
15 unit, as a whole unit.

16 A. This information has been already summarized
17 in our contentions and interrogatories.

18 Q. Did your attorney tell you to say that?

19 A. No.

20 Q. Are you familiar with the design and
21 operation of the Westinghouse Model B hydrogen
22 recombiners used at Plant Vogtle?

23 A. In a general sort of vague way.

24 Q. Can you describe one for me?

25 A. I have never seen one.

1 Q. Have you ever seen a report that described
2 one?

3 A. I have seen schematic diagrams of one in a
4 report, yes.

5 Q. Can you specifically tell me basically how
6 one operates?

7 A. The only information I could gather from
8 those was that there was an electrically heated portion
9 that gases, combining gases containing hydrogen would be
10 drawn through and they would be recombined or reacted
11 with oxygen to form water.

12 Q. Are you familiar, Dr. Deutsch, with the
13 environmental qualification testing of the Westinghouse
14 Model B hydrogen recombiner?

15 A. We did receive the report from the company on
16 its qualification test.

17 Q. Have you read that report?

18 A. Yes.

19 Q. Is it your contention that any qualification
20 testing of the hydrogen recombiners and the effect of
21 exposure of radiation were not adequately tested?

22 A. Again, I say this has all been summarized in
23 our previous documents with the company.

24 Q. I'm asking you today for your opinion under
25 oath?

1 A. My contention is that unit has not been
2 qualified as a whole unit.

3 Q. I'm asking you now about whether it's your
4 contention that the effects of exposure to radiation
5 were not adequately tested?

6 A. In relationship to the fact that the unit has
7 not been qualified as a whole, the effects of radiation
8 have not been adequately tested.

9 Q. The problem arises only from the fact it has
10 not been tested as a whole in your opinion and not from
11 the type of radiation or that sort of thing?

12 A. No. That's basically true, has nothing to do
13 with the type of radiation, no.

14 Q. The problem results from the fact it wasn't
15 tested as a whole?

16 A. Yes.

17 Q. Dr. Deutsch, is it your contention that the
18 Model B hydrogen recombiners used at Plant Vogtle
19 contain any type of transducers or sensors important in
20 their proper functioning in air accident environment?

21 A. I don't know what components it has in it.
22 Was -- information I was provided from the company told
23 me there was no -- there were no components of that
24 type. That's all -- the only basis I have.

25 Q. You have no information that suggests that

1 the information from the company was wrong?

2 A. Not at this time.

3 Q. Dr. Deutsch, is it your contention that
4 testing different component parts of the hydrogen
5 recombiner is not adequate to qualify the recombiners as
6 a unit?

7 A. Yes.

8 Q. Do you know what component parts were tested?

9 A. I recall that the power cable was tested.
10 That's the only one that I can recall.

11 Q. Do you know what tests were performed on the
12 unit as a whole?

13 A. The information I had said that there were no
14 tests on the unit as whole.

15 Q. What is the basis that you contend the
16 testing on the components is not satisfactory?

17 A. I would base it on just general scientific
18 logic.

19 Q. Could you explain that language for the
20 benefit of the transcript?

21 MR. FLACK: I think he answered the
22 question earlier.

23 MR. DAVENPORT: I'm asking him now.

24 MR. FLACK: You don't want him to repeat
25 himself, I'm sure.

1 MR. DAVENPORT: I'm asking what his prior
2 response referred to.

3 THE WITNESS: The prior response being?
4 What do you mean by prior response?

5 Q. (Dy Mr. Davenport) I was asking -- you
6 indicated that the testing component was not
7 satisfactory based upon general scientific logic, if I
8 remember correctly.

9 A. Um-hmm.

10 Q. I was asking you if you would explain that in
11 a little more detail what you mean by general scientific
12 logic.

13 A. Just briefly that the components of a piece
14 of complicated equipment are not the whole equipment.
15 It depends on how they are put together what their
16 function is.

17 Q. What components, if any, of the hydrogen
18 recombiners do you contend would have behaved
19 differently if the recombiners had been tested as part
20 of a complete prototype?

21 A. I don't have any specific recall at all.

22 Q. Do you have any knowledge of the conditions
23 to which the recombiners were exposed during
24 qualification testing by Westinghouse?

25 A. The only knowledge I have is the power cable

1 was tested.

2 Q. Dr. Deutsch, have you ever studied about or
3 done any research on steam generator tube degradation?

4 A. No.

5 Q. Do you consider yourself knowledgeable about
6 the causes of steam generator tube degradation?

7 A. I have read various reports that have been
8 summarized in our interrogatories.

9 Q. Do you recall any specific reports that
10 you've read?

11 A. I don't recall the names of those reports.

12 Q. But any reports that you have read have been
13 identified in the Intervenor's interrogatory responses?

14 A. Yes.

15 Q. Is it your contention that the steam
16 generator tubes of any Westinghouse pressure water
17 reactors have shown evidence of degradation due to
18 bubble collapse?

19 A. To the best of my knowledge this has been a
20 problem. I can't identify which specific reactors.

21 Q. Can you tell me the model steam generator?
22 Let ask ask you, do you know whether it was a
23 Westinghouse steam generator that had a problem?

24 A. That's -- yes, to the best of my knowledge
25 that was identified as a Westinghouse.

1 Q. And it was not a Model F or whatever the
2 current model was?

3 A. It was not a Model F.

4 Q. Do you have any knowledge of how the bubble
5 collapse phenomenon occurred?

6 A. No.

7 Q. Do you have any knowledge of what damage
8 occurred resulting from the bubble collapse?

9 A. No.

10 Q. Is it your contention that the steam
11 generator tubes of the Model F steam generators used at
12 Plant Vogtle are susceptible to damage due to bubble
13 collapse?

14 A. I have not read anything that would indicate
15 that they would not be just as susceptible as all of the
16 models.

17 Q. Can you describe for me the mechanism by
18 which those generator tubes would be damaged by bubble
19 collapse?

20 A. Precisely, I cannot. Just in general, it's a
21 mechanical force that could damage the tubes.

22 Q. Can you describe for me the manner in which a
23 bubble collapse might occur in a Model F generator where
24 it might be susceptible to bubble collapse?

25 A. No, I could not.

1 Q. Do you know of any specific improvements that
2 you contend would be necessary to avoid damage due to
3 bubble collapse in the Model F steam generators?

4 A. No, I don't know of any.

5 Q. But it's your contention that steam generator
6 tubes have been damaged by bubble collapse on some
7 Westinghouse steam generators?

8 A. Yes.

9 Q. Is it your contention that the steam
10 generator tubes of any Westinghouse pressured water
11 reactor have shown signs of vibration induced fatigue
12 cracking?

13 A. Yes, sir.

14 Q. What model Westinghouse steam generators?

15 A. The only knowledge that I have -- I don't
16 recall what model it was. It was not the Model F.

17 Q. What is the basis of your knowledge? What is
18 the source of your knowledge about vibration or fatigue
19 cracking?

20 A. The reports that we've indicated in the
21 interrogatories.

22 Q. Any reports other than those listed in your
23 interrogatory responses?

24 A. Not to the best of my knowledge.

25 Q. How did you come across the reports that are

1 identified in your interrogatory responses?

2 A. I don't recall specifically all the reports.

3 Q. Can you give me just in general what the
4 sources of information were for you?

5 A. Some of it was available already as a
6 starting point from information that GAME and CPG had in
7 their files. Going from there, looking at further
8 information, identifying the sources from that, looking
9 at their references and further reports and
10 cross-checking back and forth.

11 Q. Were all of those reports available from GAME
12 or CPG?

13 A. No.

14 Q. Where did you get the other reports from?

15 A. I would like to talk to my attorney.

16 MR. DAVENPORT: Let the record reflect
17 that he's consulting his attorney.

18 Q. (By Mr. Davenport) Dr. Deutsch, now that
19 you've conferred with your attorney, can you respond to
20 my question about where the other reports that you have
21 obtained information from, where you got those reports?

22 A. I obtained information about kinds of reports
23 from Union of Concerned Scientists and Nuclear
24 Information Resource Center.

25 Q. Would that be services?

1 A. Services, right.

2 Q. Which specific subject matters did you get
3 reports about from Union for Concerned Scientists?

4 A. I don't recall all of them. I got a number
5 of reports and kinds of information from each of them
6 and I don't recall specifically where which ones came
7 from, which organizations.

8 Q. The materials that you received from both of
9 those organizations, they were the actual reports as
10 opposed to summaries of reports or pleadings that
11 referenced reports?

12 A. Both, summaries of reports and actual
13 reports.

14 Q. Going back to steam generator tubes and
15 vibration induced fatigue cracking, can you describe for
16 me the phenomenon that's referred to as vibration
17 induced fatigue cracking?

18 A. I don't know how to describe that in any type
19 of scientific terms. I have never read a detailed
20 explanation of how to describe that.

21 Q. Do you know what it means? What does it mean
22 to you?

23 A. I know that there has been instances in
24 Westinghouse generators where the steam tubes for some
25 reason actually did start to vibrate under certain

1 operating conditions and cause cracking in either the
2 point of attachments or the tube.

3 Q. That was cracking other than simply fretting?

4 A. What was the last word?

5 Q. Fretting.

6 A. I don't know the distinction.

7 Q. You don't know the difference between
8 vibration induced fretting and vibration induced fatigue
9 cracking?

10 A. No.

11 Q. Do you know what the source of the vibration
12 was?

13 A. No.

14 Q. Do you know what damage occurred to the tube?

15 A. Other than general description that there
16 were cracks produced, I don't know specifically what the
17 damage was.

18 Q. Do you know whether the tube failed?

19 A. No, I don't.

20 Q. What is the source of your information
21 specifically about vibration induced fatigue cracking?

22 A. The studies that we cited in our
23 interrogatories.

24 Q. Is it your contention that degradation due to
25 vibration induced fatigue cracking might be encountered

1 in the steam generator tubes of the Westinghouse Model F
2 steam generator used at Plant Vogtle?

3 A. Yes.

4 Q. On what basis?

5 A. On the basis that this has been identified as
6 a problem with Westinghouse steam generators, and I
7 don't have any specific knowledge that the Model F would
8 alleviate this problem.

9 Q. Do you know whether or not this problem has
10 ever been encountered on the Model F steam generator?

11 A. I don't have.

12 Q. Are you aware of any design difference
13 between the Model F steam generator and prior model
14 steam generators?

15 A. I don't know of any.

16 Q. Do you have any knowledge as to what might be
17 the sources of vibration that could induce fatigue
18 cracking in the tube of a Westinghouse Model F steam
19 generator?

20 A. No.

21 Q. Is it your contention that the Applicants'
22 analysis of flow-induced vibration in its final safety
23 report is inadequate or incorrect?

24 A. I don't have -- I don't know how to evaluate
25 that report. I don't know how to evaluate that report

1 properly. I have no opinion on it.

2 Q. Have you ever reviewed that analysis?

3 A. I have looked at it.

4 Q. But you don't feel you have the knowledge or
5 expertise to evaluate it in any way?

6 A. In a technical manner, yes.

7 Q. With respect to Contention 12, Dr. Deutsch,
8 would you please state for me the substance of the facts
9 and opinions to which you will testify?

10 THE WITNESS: I would like to consult
11 with my attorney on that.

12 MR. FLACK: I don't believe he's
13 formulated his testimony at this time. Isn't that the
14 question?

15 MR. DAVENPORT: That wasn't the question.
16 I asked what the substance of the facts and opinions as
17 to which he testified.

18 MS. FOWLER: He hasn't prepared his
19 testimony.

20 MR. DAVENPORT: Let him tell me that.

21 THE WITNESS: I said I wanted to consult
22 with my attorney.

23 MR. DAVENPORT: Let the record reflect
24 he's consulting with his attorney.

25 THE WITNESS: I haven't formulated my

1 testimony in this matter, and all of the other facts
2 related that I know have been transmitted to the company
3 in terms of the contentions and the interrogatories.

4 Q. (By Mr. Davenport) So basically you have no
5 knowledge about issues relating to Contention 12 other
6 than what's been transmitted already in interrogatory
7 responses?

8 A. I didn't say that.

9 Q. Is that not an accurate statement?

10 A. It's not an accurate statement.

11 Q. Are there subjects that you might testify
12 about that relate to Contention 12 that are not
13 discussed in the Intervenor's interrogatory responses?

14 A. It's possible, yes. I haven't formulated my
15 testimony.

16 Q. Dr. Deutsch, have you ever studied about or
17 done any research on cooling tower drift deposition?

18 A. No.

19 Q. Have you ever studied about or done any
20 research on water chlorination?

21 A. I have done research in problems related to
22 that.

23 Q. What research?

24 A. The bleaching of wood pulp with chlorine
25 based chemicals.

1 Q. Can you describe generally for me a little
2 bit more about that research?

3 A. Our objective was to maximize the benefit of
4 chlorine based chemicals in bleaching and to understand
5 as much as possible the chemistry involved.

6 Q. Would that research in any way relate to
7 issues raised by water chlorination?

8 A. It's indirectly related and it gives me a
9 general knowledge of the reactions that chlorine based
10 chemicals can undergo in water.

11 Q. Dr. Deutsch, do you consider yourself
12 knowledgeable at all about cooling tower drift
13 deposition?

14 A. I have read certain reports that have been
15 documented in our interrogatories and the responses that
16 the company has given to our questions.

17 Q. Have you reviewed any reports that were not
18 prepared by the Applicants or on the Applicants' behalf?

19 MR. FLACK: You mean other than what's
20 already been identified in the various documents?

21 MR. DAVENPORT: No.

22 THE WITNESS: I have read reports not
23 prepared by the Applicant, yes. They have been cited in
24 the interrogatories.

25 (Whereupon, the court
reporter marked Applicants'

Exhibits Nos. 7 and 8
for identification.)

Q. (By Mr. Davenport) Dr. Deutsch, I'm handing you a document that's been marked as Applicant's No. 7 that I believe is the Intervenor's responses to the Applicants' first interrogatories; is that correct?

MR. FLACK: That's what it says on the second page.

THE WITNESS: That's what it says on the second page.

Q. (By Mr. Davenport) Would you review that, please, and tell me which studies cited in there relate to cooling tower drift?

A. Are you asking for independent studies?

Q. I'm asking for any studies cited in the interrogatory responses that relate to cooling tower drift. Let the record reflect that he's conferring with his attorney.

MS. FOWLER: I don't think that Dr. Deutsch remembers whether he provided some documents in your request to produce when you all came down to our offices to copy, and some of those documents might be related to -- none of those are related? Well, then the documents speak for themselves. If those are not there --

MR. DAVENPORT: I'm asking him to explain

1 his prior testimony. He's testified that studies that
2 he read were identified in the Intervenor's
3 interrogatory responses. And if it makes it any easier,
4 Dr. Deutsch, let me give you Applicants' Exhibit C,
5 which I believe is a copy of the response that you
6 prepared to certain of the interrogatories in our third
7 interrogatory request for either Applicants 7 or
8 Applicants 8. Can you tell me or point me to any
9 studies that relate to cooling tower drift?

10 THE WITNESS: Relate to or -- I did read
11 Mr. David Schlissel's testimony.

12 Q. (By Mr. Davenport) On steam generators?

13 A. Excuse me?

14 Q. His testimony did relate to steam generators;
15 did it not?

16 A. Here's cited a study by Ogata and others in
17 the Journal of Environmental Qualifications.

18 Q. What is the title of that, sir?

19 A. The title is not given here. I don't have
20 it.

21 MR. FLACE: Note the paragraph and the
22 page.

23 THE WITNESS: 12 -- 21.

24 Q. (By Mr. Davenport) Of Applicants' Exhibit C?

25 A. A.

1 Q. Any others?

2 A. That's the only one that I can identify. I
3 can --

4 MR. FLACK: We'll also check this and get
5 back to you in the next couple of days.

6 MR. DAVENPORT: I would appreciate that.

7 MR. FLACK: Again, if you don't hear from
8 us, why don't you put that in the letter also.

9 Q. (By Mr. Davenport) Now the study that you
10 referred to by Ogata, O-G-A-T-A, that appeared in the
11 Journal of Environmental Qualifications that related to
12 damage to plants that could occur at different levels of
13 salt treatment; did it not?

14 A. Yes.

15 Q. It did not have anything to do with salt
16 deposition from cooling towers, did it?

17 A. No. That's related to the environmental
18 damages.

19 Q. Caused by salt?

20 A. Caused by salt.

21 Q. Not specifically salt coming from cooling
22 towers; is that correct?

23 A. They didn't, as far as I know, didn't use
24 salt from cooling towers.

25 Q. Do you consider yourself knowledgeable about

1 water chlorination?

2 A. I never done any research directly related to
3 that except in terms of what I already stated.

4 Q. Are you familiar at all with the chlorination
5 of a municipal water system?

6 A. In a general way. Never done any research in
7 that area.

8 Q. Do you consider yourself knowledgeable about
9 the causes of cooling tower drift?

10 A. I have never done any specific work in that
11 area. I have read reports on that.

12 Q. On the causes of cooling tower drift?

13 A. Just the fact that there are drifts from
14 cooling towers.

15 Q. I'm asking specifically now about the causes
16 of drift.

17 A. No.

18 Q. You're not knowledgeable about the causes of
19 drift?

20 A. I don't recall reading any specific documents
21 on the causes.

22 Q. Do you consider yourself knowledgeable about
23 drift dispersion and dispersion model?

24 A. No, I don't.

25 Q. Is it your contention that modeling to

1 determine cooling tower drift deposition pattern is an
2 inappropriate technique to assess deposition pattern?

3 A. Again, I'm not an expert in this area, but in
4 a general way modeling has been supplemented by
5 empirical evidence in all cases.

6 Q. What alternative methods do you feel
7 appropriate for determining cooling tower deposition?

8 MR. FLACK: You mean empirical evidence?

9 Q. (By Mr. Davenport) Are you aware of any
10 empirical evidence that exists concerning deposition
11 patterns for any cooling towers similar to the Plant
12 Vogtle natural draft cooling towers?

13 A. No, I am not.

14 Q. Have you reviewed the EUS Corporation report
15 by Morton Goldman concerning drift deposition from the
16 Plant Vogtle cooling towers? That report is entitled An
17 Evaluation of Cooling Tower Drift Deposition at the
18 Vogtle Electric Generating Plant.

19 A. Was that one of the documents that you
20 supplied to us? I don't recall the name of that.

21 C. Yes.

22 MS. FOWLER: Do you know when you all
23 supplied this because Howard has been out of town the
24 last month.

25 MR. DAVENPORT: It was supplied twice,

1 once when it was supplied to the FRC back in late
2 January or early February and once again when we
3 submitted our responses to the Intervenor's third
4 interrogatories.

5 MS. FOWLER: Both of those were in 1985?

6 MR. DAVENPORT: Yes.

7 MS. FOWLER: So Howard probably hasn't
8 seen it.

9 THE WITNESS: I don't recall seeing it.

10 (Whereupon, the court
11 reporter marked Applicants'
12 Exhibit No. 9 for
identification.)

13 Q. (By Mr. Davenport) For the record, you're
14 looking at what's been marked as Applicants' Exhibit 9?

15 A. Yes.

16 Q. You have not previously seen that document?

17 A. I don't recall seeing this, ever seeing this
18 document.

19 Q. So I would assume that you have no basis for
20 evaluating the modeling study performed by HUS
21 Corporation since you haven't seen the report?

22 A. Correct.

23 Q. Dr. Deutsch, do you consider yourself
24 knowledgeable about the effect of salt drift on the
25 surrounding environment?

1 A. I have read certain reports, some of which
2 have been documented, which have been summarized in our
3 interrogatories about it. It's not an area that I have
4 done any research.

5 Q. Any report other than the one that was
6 prepared by Ogata that we have previously referred to?

7 A. I don't recall any other reports. I may have
8 read incidentally some other reports, but I don't
9 recall.

10 Q. Do you know how the salt was applied to the
11 vegetation in the Ogata study?

12 A. I believe that it was directly applied as a
13 solution.

14 Q. So a saline solution would be applied to the
15 leaves of the plant?

16 A. As best I can recall that was the way it was
17 done.

18 Q. Do you contend, Dr. Deutsch, that a drift
19 deposition rate of 17 pounds per acre per year would
20 cause damage to the vegetation or have some other
21 adverse environmental effect?

22 A. To the best of my knowledge, from what I've
23 read, there is no exact cutoff point on when a specific
24 drift rate would be harmful or not.

25 Q. Do you have an opinion as to whether a drift

1 deposition rate of 17 pounds per acre per year would
2 cause damage to the vegetation?

3 A. Based on what I have seen, this would be in
4 the lower range of values that I have ever seen reported
5 as possible drift rates, so compared to other figures
6 this would be a low figure. But I don't know. I have
7 never read anything that says exactly what the cutoff
8 point and when damage occurs and when it doesn't.

9 Q. Do you know what types of vegetation might be
10 damaged by a drift deposition rate of 17 pounds per acre
11 per year?

12 A. No, I don't.

13 Q. Do you know what type of damage might occur
14 to the vegetation from such a drift rate?

15 A. No, I don't.

16 Q. Do you contend that a drift deposition rate --
17 Do you wish to confer with your attorney?

18 A. Yes.

19 (Whereupon, a discussion was held
20 off the record.)

21 Q. (By Mr. Davenport) What literature have you
22 read concerning drift deposition or salt deposition
23 rates that cause damage to the vegetation other than the
24 Ogata report?

25 A. Those that have been cited in the

1 interrogatories and contentions.

2 Q. Can you identify for me any other studies in
3 Applicants' Exhibit 7 or Applicants' Exhibit 8 other
4 than the Ogata study that deal with the effects of salt
5 on vegetation?

6 A. Well, I'll just look through this.

7 Q. Those are all of the interrogatory responses
8 provided by the Applicants concerning Contention 12. By
9 the Intervenor, excuse me.

10 A. I may have read some other reports that were
11 made available to us in the discovery process. We'll
12 have to review our records of those reports.

13 Q. Did you actually review any documents in the
14 discovery room at Plant Vogtle yourself?

15 A. No.

16 Q. Did you just review copies of documents that
17 were made by the Intervenor?

18 A. Yes.

19 Q. Do you know whether those documents that were
20 copied by the Intervenor included any full reports?

21 A. Yes, they did.

22 Q. Are there any other reports identified in
23 your interrogatory responses that you have been able to
24 find other than the Ogata report concerning salt damage
25 to vegetation?

1 A. There's none that I have been able to see in
2 reviewing this right now.

3 Q. Dr. Deutsch, is it your contention that a
4 drift deposition rate of 2 pounds per acre per year
5 would cause damage to vegetation or have some other
6 adverse environmental effect?

7 A. I can refer back to my previous answer and
8 say I have never read anything that does identify an
9 exact point in which a given drift rate will cause
10 damage. That's certainly much lower than 17 pounds and
11 would probably have -- tend to have less effect than 17
12 pounds.

13 Q. Have you ever seen anything that suggested a
14 drift deposition rate of 2 pounds per acre per year
15 would have any effect upon vegetation, any harmful
16 effect?

17 A. I have not seen anything.

18 Q. In fact, is there a possibility that a drift
19 deposition rate of 2 pounds per acre per year might have
20 a beneficial effect on vegetation?

21 A. I've not seen any reports. I just -- I guess
22 it's just as likely one way or the other since I don't
23 have any knowledge.

24 Q. Is it your contention all of the dissolved
25 solids from the drift from the Plant Vogtle towers would

1 be salts?

2 A. No.

3 Q. Do you know what portion of the dissolved
4 solids in the drift from the Plant Vogtle cooling towers
5 would be salts?

6 A. No, I don't know.

7 Q. Do you disagree with the statement made by
8 the Nuclear Regulatory Commission in the draft
9 environmental report that approximately one-seventeenth
10 of the dissolved solids in a drift would be salt?

11 A. I don't recall that statement.

12 Q. Did you have any basis for disagreeing with
13 it at this time?

14 A. The statement is that one seventeenth of the
15 -- I don't have any basis at this time for agreeing with
16 it or disagreeing with it.

17 Q. Is it your contention that all of the salts
18 in the drift from the Plant Vogtle cooling towers would
19 be harmful to vegetation?

20 A. Could you repeat the question?

21 Q. Is it your contention that all of the salts
22 from the drift from the Plant Vogtle cooling towers
23 would be harmful to vegetation?

24 A. I have no basis to break it down into
25 subcategories of salts, if that's what you're asking.

1 Q. But the possibility does exist that some
2 level of salt drift might actually be beneficial to
3 vegetation?

4 A. I have no knowledge.

5 Q. You have no knowledge on which you would
6 dispute that statement at this time?

7 A. No.

8 Q. Is there a threshold of salt drift deposition
9 rate below which no damage to vegetation occurs to your
10 knowledge?

11 A. Not to my knowledge.

12 Q. Is it your contention that anything above
13 zero will have an adverse effect?

14 A. No, it's not.

15 Q. So there is some level below which no adverse
16 effect will occur and some level above which an adverse
17 effect will occur?

18 MR. FLACK: I don't think he said that.

19 THE WITNESS: I'm willing to stipulate
20 there's some level no effects will occur. I think it's
21 an extrapolation of almost anything to zero.

22 Q. (By Mr. Davenport) Isn't it true there's
23 some level above zero of salt drift deposition of which
24 no harmful effect will occur? Your response indicated
25 no effects. I'm now specifically asking about harmful

1 effects.

2 A. There's some point above zero in which no
3 effects can be observed.

4 Q. So basically there is some threshold level of
5 salt drift deposition for damage to vegetation but
6 you're not aware of that level?

7 A. From what I have read, there is indications
8 there's some level at which no effects are observed. I
9 don't want to put that -- that's all I can answer.

10 Q. You don't know what specific levels?

11 A. I don't know that level.

12 Q. Do you disagree with the cooling tower drift
13 parameters used by the Applicants in predicting drift
14 deposition rates?

15 A. I have no basis to disagree with it.

16 Q. Have you yourself attempted to estimate drift
17 deposition rates for the Plant Vogtle natural cooling
18 towers?

19 A. No, I haven't.

20 Q. Do you contend that chlorine gas will be
21 emitted from the Plant Vogtle cooling towers?

22 A. It's conceivable there would be some chlorine
23 gas, but our contention is meant to mean chlorine
24 compounds other than chloride anion.

25 Q. What do you mean when you use the term

1 chlorine gas?

2 A. Some form of elemental chlorine that has
3 oxidizing potential.

4 Q. Can you give me a more specific response?

5 A. This was all summarized in our
6 interrogatories. I have nothing further to add than
7 what has already been stated in the interrogatories.

8 Q. What did you use the term elemental chlorine
9 to refer to?

10 A. The element of chlorine and specifically as
11 stated in the interrogatories forms of chlorine other
12 than chlorine anoid.

13 Q. What mechanical and chemical actions would
14 result in the emission of chlorine gas from the cooling
15 towers?

16 A. If you mean chlorine gas in the form that I
17 previously defined, the same mechanisms which cause a
18 salt drift, whatever mechanisms expel salt drift from a
19 tower could expel chlorine.

20 Q. That's the mechanical action involved?

21 A. Whatever mechanisms cause salt drift would
22 cause expulsion of chlorine.

23 Q. What would be the environmental effect of
24 chlorine gas emitted from the Plant Vogtle cooling
25 towers?

1 A. I have not been able to read any studies that
2 would say exactly at what levels, but certainly at some
3 level that chlorine compounds are known to be toxic to
4 life forms in general.

5 Q. That's at very high levels, is it not?

6 A. Compared to lower levels.

7 Q. Let me rephrase that. Do you have any idea
8 what amount of chlorine gas would be emitted from the
9 natural drift cooling towers at Plant Vogtle?

10 A. At this time I have not been able to
11 formulate any specific prediction as to the levels of
12 chlorine compounds that would be expelled.

13 Q. I'm asking specifically about chlorine gas.
14 I haven't gotten to chlorine compounds or did you
15 include compounds within the phrase chlorine gas?

16 A. I believe that's what we went over a few
17 minutes ago. I said -- I defined chlorine gas. What I
18 mean by that now is chlorine compounds other than
19 chloride anion.

20 Q. What amount of chlorine derivatives or
21 chlorine compounds do you contend would be emitted from
22 the cooling towers as part of the drift?

23 A. As this time I have not formulated any exact
24 drift of chlorine compounds.

25 Q. Would the chlorine compounds and chlorine

1 derivatives that you contend that would be emitted from
2 the cooling tower be contained in the drift?

3 A. The problem that I have with that is what do
4 you mean by drift. Other than what comes out of the
5 tower?

6 Q. I'm talking about essentially the moisture
7 that comes out of the top of the tower as the hotter air
8 rises out. I'm talking about basically water particles
9 that come out of the top of the tower as part of the
10 cooling process?

11 A. As opposed to water vapor?

12 Q. Yes.

13 A. Can you repeat the question, please?

14 Q. Are you contending that the chlorine that
15 would be emitted from the natural drift cooling towers
16 would be contained in the drift?

17 A. Part of it would be.

18 Q. What other chlorine would be emitted from the
19 cooling towers?

20 A. Just the forms of chlorine that I have
21 already talked about.

22 Q. What would be the other mechanisms besides
23 the drift that would result in the emission of chlorine?

24 A. I still don't know what you mean by drift.
25 The term salt drift is used here. My understanding is

1 that is the materials we're talking about. I mean that
2 is it's not -- the salt drift is not just water. And
3 now you're sort of like you're saying that drift is
4 water but, you know, it's very confusing what you're
5 saying.

6 Q. What I'm asking basically is what emissions
7 from the cooling towers do you contend will result in
8 chlorine being placed in the surrounding environment?

9 A. I'm sorry. Is the question --

10 MR. FLACK: What?

11 MR. DAVENPORT: Emissions.

12 MR. FLACK: I think he's answered that.

13 MR. DAVENPORT: I want to be sure I
14 understand.

15 THE WITNESS: I have answered it. In my
16 opinion that these chlorine compounds would be emitted
17 by the same mechanism that salt drift is emitted from
18 the towers.

19 Q. (By Mr. Davenport) Basically this contention
20 refers to chlorine emitted from the cooling towers as
21 part of the drift; is that correct?

22 A. I presume that that's -- I mean, it's hard
23 for me to understand what the distinction --

24 Q. Did you draft this contention, Dr. Deutsch?

25 A. Yes.

1 Q. What did you intend to refer to?

2 A. As chlorine compounds emitted from the tower
3 as part of or separate from salt drift, whether they
4 occur in exactly the same little particle or whether
5 they're in a little different particle.

6 Q. You're talking about basically chlorine
7 that's transported by some mechanism from the tower
8 through the atmosphere to the surrounding ground?

9 A. Yes.

10 Q. Do you know how the amounts of chlorine
11 derivatives and chlorine compounds in the water in the
12 cooling towers at Plant Vogtle compares to the amount of
13 chlorine compounds and derivatives in chlorinated
14 drinking water?

15 A. No, I don't.

16 Q. You don't know whether it would be more or
17 less?

18 A. I don't have any basis to answer that
19 question.

20 Q. Would you agree with me that if it were the
21 same as chlorinated drinking water, then there would be
22 no adverse environmental effect?

23 MR. FLACK: I object. The witness has
24 already answered.

25 MR. DAVENPORT: Mr. Flack, he didn't know

1 whether it was the same as chlorinated water. I'm
2 asking him to assume it would be the same and ask if he
3 thinks there would be an adverse environmental effect?

4 THE WITNESS: I have no basis to answer
5 that.

6 Q. (By Mr. Davenport) Is it your contention
7 that a chloride deposition rate from the Plant Vogtle
8 cooling towers of two pounds per acre per year would
9 cause damage to the vegetation or other adverse
10 environmental effect?

11 A. I don't have any specific knowledge of what
12 exact drift rate that chloride would be harmful to
13 vegetation.

14 Q. Have you reviewed the Applicants' responses
15 to the Intervenor's interrogatories on Contention 12?

16 A. Yes.

17 Q. Have you a dispute with the Applicants'
18 estimate of a maximum chloride deposition rate of 1.3
19 pounds per acre per year as explained in the response?

20 A. Can you give us the approximate date on that?
21 Was it this year?

22 Q. Yes. February.

23 A. I don't have any basis at this time to
24 dispute that.

25 Q. Fr. Deutsch, do you know anything about

1 diesel generators?

2 A. Yes.

3 Q. Do you know anything about the TransAmerica
4 Delaval emergency diesel generators used at Plant
5 Vogtle?

6 A. Yes.

7 Q. What specifically?

8 A. They're called TDI diesel generators. I have
9 read general reports that say they don't work too
10 reliably.

11 Q. Have you ever studied the mechanics of diesel
12 engines?

13 A. No.

14 Q. Do you consider yourself knowledgeable about
15 the particular defects that have occurred with diesel
16 generators at Plant Vogtle?

17 A. No.

18 (Whereupon, a recess was taken.)

19 Q. (By Mr. Davenport) Dr. Deutsch, because of
20 my somewhat confusing questions, I'm not sure whether I
21 covered everything with respect to chlorine. I'm not
22 sure I asked you questions about chlorine derivatives as
23 opposed to chlorine gas. From the way you used the term
24 gas, did you encompass chlorine derivatives?

25 A. Yes.

1 Q. The questions you answered about gas apply to
2 chlorine derivatives as well?

3 A. Yes.

4 MR. DAVENPORT: I have no further
5 questions.

6 Q. (By Mr. Flack) When you use the term
7 interrogatories in your testimony here this morning, can
8 you explain what you mean by that?

9 A. I guess I was using it in a sort of a loose
10 way. I meant all written responses between the company
11 or the Nuclear Regulatory Commission that I participated
12 in any way or that that I'm familiar with in any way.
13 Not exactly --

14 Q. You don't mean in the legal sense answers to
15 interrogatories as opposed to a request to admit?

16 A. All of those things I was trying to mean.

17 MR. DAVENPORT: For the record, I did not
18 object to you're asking questions. I will in the
19 future.

20 MR. FLACK: I'm properly noticed. I'm
21 sorry.

22 MR. DAVENPORT: Applicants Exhibit 7 is a
23 copy of the interrogatory responses to the Applicants'
24 first interrogatories with a copy of a cover letter from
25 Laurie Fowler, dated September 5, 1964. Applicants'

1 Exhibit 8 is a copy of a portion of the interrogatory
2 responses prepared by the Intervenor to the Applicants'
3 third interrogatories. Those responses relate to
4 Contentions 10, 11 and 12 with a cover letter dated
5 February 7, 1985, from Tim Johnson. And Applicants'
6 Exhibit 9 is a report prepared by NUS Corporation
7 entitled An Evaluation of Cooling Towers Drift
8 Deposition at the Vogtle Electric Generating Plant,
9 dated January 29, 1985. And I as counsel for the
10 Applicant will retain these exhibits.

11 (Deposition concluded.)
12
13
14
15
16
17
18
19
20
21
22
23
24
25

C E R T I F I C A T E

STATE OF GEORGIA:

COUNTY OF FULTON:

I hereby certify that the foregoing transcript was taken down, as stated in the caption, that the witness was first duly sworn, and the questions and answers thereto were reduced to typewriting under my direction; the foregoing pages 1 through 86 represent a true, correct, and complete transcript of the evidence given upon said hearing, and I further certify that I am not of kin or counsel to the parties in the case; am not in the regular employ of counsel for any of said parties; nor am I in anywise interested in the result of said case.

This, the 29th day of March, 1935.

Mary J. Brewster
MARY J. BREWSTER, CCP-B-728
My commission expires the
3rd day of December, 1935.