

Official Transcript of Proceedings
NUCLEAR REGULATORY COMMISSION

Title: In the matter of:
Georgia Power Company, et al.
(Vogtle Units 1 & 2)

Docket Number: 50-424-OLA-3
50-425-OLA-3

Location: Augusta, Georgia

Date: August 24, 1995

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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ATOMIC SAFETY AND LICENSING BOARD

HEARING

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In the matter of: : 50-424-OLA-3
 GEORGIA POWER COMPANY, et al. : 50-425-OLA-3
 : Re: License Amendment
 (Vogtle Electric Generating : (transfer to
 Plant, Unit 1 and Unit 2) : Southern Nuclear)
 : ASLBP No.

-----X 93-671-01-OLA-3

Thursday, August 24, 1995

Plantation Room West

Telfair Inn

326 Greene Street

Augusta, Georgia

The above-entitled matter came on for hearing,
 pursuant to notice, at 9:00 a.m.

BEFORE:

PETER B. BLOCH Chairman
 JAMES H. CARPENTER Administrative Judge
 THOMAS D. MURPHY Administrative Judge

1 APPEARANCES:

2

3 On behalf of the NRC:

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19 ALSO PRESENT:

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21

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24

25

1

I N D E X

2

WITNESSES:DIRECT CROSS REDIRECT RECROSS

3

Sheldon Owyong

4

Robert Johnston

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By Mr. Kohn

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12524

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12761

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By Ms. Young

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12683

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12763

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By Mr. Blake

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12752

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E X H I B I T S

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EXHIBIT NO.DESCRIPTIONIDENTREC'D

11

GPC:

12

II-167

NUREG 14.10, Appendix J

12522

12522

13

Intervenor:

14

II-226

Johnston Notes, 7/90

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12661

15

II-229

Signed Cooper Report

12636

12638

16

Board:

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Measurements taken at Vogtle

12518

12518

18

Staff:

19

II-68

Generic Letter 38-14

12625

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P R O C E E D I N G S

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CHAIRMAN BLOCH: The hearing will come to order.

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MR. BLAKE: Judge Bloch, I have a couple of quick preliminary matters. One is that I've now read the in camera sessions and am considering what steps to take and I'm advising Mr. Kohn particularly and the Board more generally that that could amount to motions.

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CHAIRMAN BLOCH: It could be what?

10

MR. BLAKE: Motions.

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I have passed out to the Board and to the parties a three page document which the parties may want to look at and then ask questions about. This is in response to the request that we do measurements on the receivers, shell temperature. These temperatures were taken about halfway up each of the receiver cylinders and they were taken on contact at the cylinder and then at a distance of about a foot away from the cylinder. Those are reflected as contact and ambient. They were taken on Unit 1 A and B trains while no particular activities were underway. That's the first two documents.

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And the third was, as the legend indicates on it, readings taken at five minutes after the compressor shut off. This was just timed after a normal cycling of the compressor, to make up the pressure. And then the

1 bottom one was taken seven minutes after the first readings
2 had been completed, which might be 12 or it might be 13 --
3 something on that order.

4 That's all we've done. If there are more
5 extensive readings that need to be taken or after you've
6 considered what we've provided, you have questions or want
7 more, just let me know.

8 CHAIRMAN BLOCH: So that I can make sure to
9 mark it on the document accurately. Unit 1 -- the first
10 page is with no activity, right?

11 MR. BLAKE: Yes, the first two pages are with
12 no activity.

13 CHAIRMAN BLOCH: No recent activity.

14 And the third page is activity how long before
15 this?

16 MR. BLAKE: It was -- the top readings are both
17 taken on the A train VO2 receiver. The top readings are
18 just five minutes after the compressor shut off and then
19 the bottom readings are seven minutes after the first
20 readings were taken.

21 CHAIRMAN BLOCH: Thank you.

22 And so that the record will be clear about what
23 we're talking about, this should be marked as a Board
24 Exhibit, which is Board Exhibit 9. Is there an extra copy
25 for the reporter? Great.

1 (The document referred to was marked
2 for identification as Board Exhibit
3 Number 9 and received in evidence.)

4 MS. YOUNG: Mr. Blake, could you explain who
5 the readings were taken by?

6 MR. BLAKE: No, I don't know, but I will check
7 and find out. By name of person?

8 MS. YOUNG: Or position.

9 MR. BLAKE: I'm sorry, I don't know.

10 CHAIRMAN BLOCH: Mr. Reporter, I'd like to
11 inquire over whether you know that the in camera session
12 from last Friday about the water is no longer in camera.

13 THE REPORTER: Yes, it's all -- oh, I don't
14 know about Friday now. Friday was the one you did in
15 Washington.

16 CHAIRMAN BLOCH: Okay, the Friday one I told
17 them at the close of it that it was not. It was Thursday.

18 THE REPORTER: Thursdays is all in the
19 transcript.

20 CHAIRMAN BLOCH: It's in the regular
21 transcript.

22 THE REPORTER: Yes, because you told us before
23 we left that it was no longer in camera.

24 CHAIRMAN BLOCH: No, I didn't, it wasn't before
25 I went home that I said that. I decided that after the

1 Friday session.

2 ADMINISTRATIVE JUDGE MURPHY: No, that was
3 after the session --

4 THE REPORTER: The last day we were here, the
5 day it was in camera, Judge?

6 CHAIRMAN BLOCH: Yes.

7 THE REPORTER: It was in camera, it was out of
8 camera, it was back in camera and finally it was back out.

9 CHAIRMAN BLOCH: When you delivered it to me,
10 it was still in camera on Friday.

11 ADMINISTRATIVE JUDGE MURPHY: We're talking
12 about last week.

13 CHAIRMAN BLOCH: Last week. Let's go off the
14 record.

15 (Discussion off the record.)

16 CHAIRMAN BLOCH: Back on the record. I'd like
17 to welcome the witnesses back. I appreciate the color
18 coordination today.

19 MR. BLAKE: I do have a couple more brief
20 items, Judge Bloch.

21 One is that we have documents to pass out today
22 regarding the discovery of waters in these Ts that we've
23 referred to, both from the February-March outage and from
24 this past weekend's activities, which I earlier reported to
25 the Board this week, where water had been found in some of

1 the others.

2 I contacted -- talked with counsel first
3 yesterday afternoon and then contacted -- witnesses were
4 contacted, and our plan is to -- I guess our plan was to
5 have Mr. Webb available at the end of the day today to fill
6 up any time after Johnston and Owyong. I understand from
7 the earlier indicator that you have from Mr. Kohn this
8 morning that Mr. Johnston and Owyong may --

9 CHAIRMAN BLOCH: That's the plan, you never
10 know. We could always figure out a way to save time.

11 MR. BLAKE: But in any event, we have Mr. Webb,
12 who would be available later today and tomorrow morning
13 he'd be available plus the I&C techs for tomorrow, which is
14 Friday.

15 CHAIRMAN BLOCH: Now Webb would be available on
16 the moisture issue on the Ts, the Johnston issue?

17 MR. BLAKE: No. We're not talking on the
18 Johnston issue.

19 CHAIRMAN BLOCH: I didn't think so.

20 MR. BLAKE: We're going to fill out the rest of
21 the hearing week, we talked about how that would be done.
22 They indicated, Mr. Kohn and Ms. Young both, that Mr.
23 Eckert, in order to complete him, could be fairly extensive
24 and so he fell -- that's the reason that his name no longer
25 appears. Webb, they both indicated would be quite short

1 and then we have the I&C techs that we're trying to get out
2 of the way while we're down here in Augusta.

3 CHAIRMAN BLOCH: Does it look like we're going
4 to have to be coming back to Augusta at some point?

5 MR. MICHAEL KOHN: Probably. We're going to
6 obviously have more hearings. Whether they're in
7 Washington or Augusta has not been decided, but --

8 MR. BLAKE: Well it has been decided that the
9 first two weeks in September will be in Washington.

10 CHAIRMAN BLOCH: Yes, the question is whether
11 we have to come back here the third week in September.

12 MR. MICHAEL KOHN: You know, I think there's
13 something that also has to be looked at is Intervenor
14 hasn't rested its case, there's all sorts of discovery
15 pending, we're not prepared to go forward with that
16 discovery based on the amount of work we have to do for
17 this hearing. We can't just go right into doing
18 depositions. There has to be some down-time for us to
19 figure out and arrange for the discovery, which I assume --

20 CHAIRMAN BLOCH: All right, why don't we work
21 that out in conversations between the parties and then
22 we'll talk about it with the Board later.

23 MR. MICHAEL KOHN: Okay.

24 MR. BLAKE: And the only other one was that we
25 have Appendix J that we can mark and put on the record.

1 There has been a number of references.

2 CHAIRMAN BLOCH: It sounds like that's very
3 important that that be done.

4 MR. BLAKE: We've made copies of Appendix J and
5 I'll distribute them and provide them to the court reporter
6 as well. It would be GPC Exhibit II-167, and I'd ask that
7 it be marked and accepted, I think everybody is familiar
8 with it, and from the record standpoint, it's Appendix J to
9 14.10 -- NUREG 14.10, which was done after the site area
10 emergency by the NRC staff in 1990.

11 CHAIRMAN BLOCH: It may be marked and accepted.

12 (The document referred to was marked
13 for identification as GPC Exhibit
14 Number II-167 and received in
15 evidence.)

16 CHAIRMAN BLOCH: Mr. Kohn.

17 MR. MICHAEL KOHN: Intervenor would like to
18 correct one perhaps misconception Mr. Blake has. At 10:30
19 last night, I received a call from Mr. Penland about the
20 arrangement of witnesses. It was my understanding with my
21 earlier conversation with Mr. Blake that we were going to
22 have one witness written in stone who would be next, and in
23 my conversation with Mr. Penland, it was left up in the air
24 as to two different witnesses. And I told Mr. Penland I
25 believe that based on that, the I&C tech are the next

1 logical person, and that is --

2 CHAIRMAN BLOCH: Does that mean you prefer
3 having Mr. Eckert next?

4 MR. MICHAEL KOHN: No, the I&C technicians
5 would be the next persons.

6 MR. BLAKE: I can't rebut that. We talked
7 yesterday here. We identified three people -- Kitchens,
8 Webb and the three I&C techs. They said they didn't care
9 what order they came in, just let them know so that he
10 could prepare. I said I'd call him last night and let him
11 know. After we finally found out people's availability,
12 Mr. Webb was out for some reason. When he came in, I then
13 decided it would be Webb, based on representations I'd had
14 of how long it would take Webb and then the I&C people.
15 I'm sure that's what Mr. Penland told him.

16 CHAIRMAN BLOCH: Unless there's a motion
17 requiring some relief from the Board, I would prefer that
18 we just have discussions of what the schedule is and what
19 the reactions are about the schedule. If we get into who
20 struck whom, we should have a motion.

21 MS. YOUNG: Judge Bloch, my recollection from
22 talking to Mr. Lamberski this morning is that I was told
23 the names of the three I&C technicians first and then the
24 additional GPC witness, so Mr. Kohn's understanding may not
25 be incorrect. I didn't talk to Mr. Penland, so I can't

1 represent what Mr. Penland said.

2 CHAIRMAN BLOCH: So to the extent we were
3 really talking about what the order of witnesses will be,
4 the Board's comments were not appropriate.

5 MR. BLAKE: Mr. Owyong and Johnston's flight
6 plans are to leave first thing tomorrow morning. I hope
7 we'll be able to accommodate that.

8 CHAIRMAN BLOCH: Let's see if we can do that.
9 Whereupon,

10 SHELDON OWYOUNG

11 ROBERT P. JOHNSTON

12 RESUMED their status as witnesses herein, and were examined
13 and testified further as follows:

14 CROSS EXAMINATION (Continued)

15 BY MR. MICHAEL KOHN:

16 Q Mr. -- I guess both gentlemen -- have either of
17 you testified as experts in the past?

18 A (Witness Johnston) I have not.

19 A (Witness Owyong) I have not.

20 Q And have you ever prepared expert testimony in
21 the past?

22 A (Witness Johnston) I have not.

23 A (Witness Owyong) No, I haven't.

24 Q And can you tell me how the testimony that has
25 been submitted to the record was prepared?

1 CHAIRMAN BLOCH: You did this yesterday.

2 BY MR. MICHAEL KOHN:

3 Q Other than the documents that you provided to
4 Georgia Power and the documents attached to your testimony,
5 did either of you review or consider any other documents
6 while drafting your testimony?

7 A (Witness Johnston) I did not review any other
8 documents before drafting my testimony. Since that
9 testimony I have reviewed other documents.

10 A (Witness Owyong) I have looked at schematics
11 to refresh my memory of the system.

12 Q And do you have those documents with you?

13 A (Witness Johnston) Which documents are you
14 referring to?

15 Q Any documents that you reviewed to prepare for
16 testifying today.

17 A (Witness Johnston) I believe those were
18 provided to you. That's what we were dealing with
19 yesterday.

20 Q I'm saying documents in addition to those.

21 A (Witness Johnston) Again, I reviewed documents
22 after preparing my testimony, in addition to those that we
23 were discussing yesterday.

24 Q In addition?

25 A (Witness Johnston) After preparing my

1 testimony.

2 Q And what are the documents you looked at after
3 preparing your testimony?

4 A (Witness Johnston) There are a number of them.
5 One is NUREG 14.60 -- or 14.10, dealing with the NRC's
6 evaluation of the event. I believe I looked at the
7 prefiled testimony of Mr. Mosbaugh. I have looked at
8 prefiled testimonies of Mr. Stokes. There are numerous
9 documents.

10 Q And you said you looked at -- Mr. Owyong,
11 could you tell me what documents you looked at?

12 A (Witness Owyong) These were basically system
13 schematics, the control panel schematics and engine
14 schematics.

15 Q And did you look at portions of prefiled
16 testimony?

17 A (Witness Owyong) Yes, I have, but that was
18 before the testimony.

19 Q And other than the Calcon sensor
20 representative, did you contact any other individuals or
21 did any other individuals contact you to aid you in
22 preparing for your testimony or testifying here today?

23 A (Witness Owyong) I have contacted the Norgren
24 -- a Norgren engineer, I don't remember his name, to gather
25 information as far as the filter element and its operation.

1 operation. But that wasn't necessarily for preparation for
2 this hearing right here, it was for the testimony, the
3 written testimony.

4 Q For the prefiled testimony?

5 A (Witness Owyong) Yes.

6 A (Witness Johnston) I had discussions with Mr.
7 Owyong, Mr. Pesout, with Mr. Lowery, with Mr. Gildea.
8 These are all engineers in our office in Alameda.

9 Q And did either of you have discussions with
10 anyone at Georgia Power?

11 A (Witness Owyong) No.

12 A (Witness Johnston) Counsel.

13 A (Witness Owyong) Oh, yes, Mr. Lamberski.

14 Q And did --

15 CHAIRMAN BLOCH: Mr. Kohn, you know, on the
16 technical matters that are being presented here, it's quite
17 clear the Board is going to decide on technical reasons and
18 will not be considering matters of liking people or not
19 looking them or how they prepared their testimony. You can
20 go into that if you really want to, but I don't see how
21 it's going to help you with the Board.

22 MR. MICHAEL KOHN: Your Honor, it may not help
23 me with the Board, but I think this proceedings is going to
24 be probably in more places than the Board, so I have to
25 look at the ultimate things. And I'm sorry I make a lot of

1 objections I wish I didn't have to do.

2 BY MR. MICHAEL KOHN:

3 Q So are you gentlemen testifying as fact
4 witnesses or as expert witnesses?

5 A (Witness Johnston) It's my understanding we're
6 testifying as expert.

7 A (Witness Owyong) That's correct.

8 Q Now let's turn to the Clark Air Base in the
9 Philippines. Would you agree that those diesels were
10 subject to instrument air with a moisture content above 50
11 degrees Fahrenheit since the dryers were taken out of
12 service some four years ago?

13 A (Witness Johnston) A moisture content problem?

14 Q Let me rephrase that. A dew point of above 50
15 degrees since the dryers were taken out of service.

16 A (Witness Johnston) I would say absolutely.

17 A (Witness Owyong) Yeah.

18 A (Witness Johnston) It's an extremely humid
19 environment.

20 CHAIRMAN BLOCH: Mr. Kohn, you asked us for a
21 ruling yesterday to strike certain testimony and we didn't
22 make that ruling. I do want to state that this morning we
23 have reviewed the response to the generic letter, and as
24 best we can tell, the issues in this proceeding at this
25 time are:

1 First, is Georgia Power complying with the
2 generic letter, which as we understand it requires that
3 when a dew point of above 50 degrees is found, that they
4 take prompt measures, reasonable measures, to get the dew
5 point down and that -- well, that they take reasonable
6 measures to get the dew point down.

7 In addition to that, there are questions about
8 whether there may have been misrepresentations to the NRC.

9 But as I understand the status of this record,
10 the only relevance of whether corrosion has been found is
11 whether or not there's been some indication of pervasive
12 long-term violation of a dew point requirement. But it
13 doesn't prove that the dew point requirement has been met,
14 because that requires reasonable response to dew points
15 above 50 degrees.

16 And I don't know if this will help you, but
17 it's possible that it will narrow the issues some, so that
18 some of the issues you're thinking of pursuing won't need
19 to be pursued.

20 MS. YOUNG: Judge Bloch, were you suggesting
21 that the generic letter states a requirement? I may have
22 misunderstood you.

23 CHAIRMAN BLOCH: No. It was that the response
24 to the generic letter states that 50 degree dew point will
25 be maintained, which seems to me in legal terms to state

1 that there'd be a reasonable effort to get the dew point
2 down whenever it was up.

3 MS. YOUNG: And that's a commitment which may
4 or may not be enforceable, depending on what the NRC does.
5 Is that your understanding? It's not a Tech Spec
6 requirement, for example.

7 CHAIRMAN BLOCH: It is not a limiting condition
8 of operation, it's not a Tech Spec requirement, but it's a
9 commitment and I assume that when companies make
10 commitments, they mean them.

11 If the Staff has some other view of that, I'm
12 sure the Staff witnesses will verify that. But that's the
13 strongest commitment that I can see in the record on 50
14 degree dew point during operation.

15 BY MR. MICHAEL KOHN:

16 Q And did the Plant Vogtle diesels have identical
17 logic elements as found in the Clark Air Force Base
18 diesels?

19 A (Witness Owyong) Yes, they do.

20 Q Mr. Owyong, would you turn to Exhibit E
21 attached to your testimony? Are the metal parts within the
22 logic elements plated to resist corrosive effects?

23 A (Witness Owyong) Yes, they are.

24 Q And if moisture was present, would you expect
25 to see corrosion on those components?

1 A (Witness Owyong) I would expect to see
2 corrosion on the spring element, the spring that's in the
3 unit. That's the only part that really isn't coated.

4 Q The spring in the logic element?

5 A (Witness Owyong) Yes.

6 Q And would the corrosion on the spring affect
7 the function of the logic element?

8 A (Witness Owyong) Over a period of time, yes.

9 BOARD EXAMINATION

10 BY CHAIRMAN BLOCH:

11 Q Do we know anything about what that period of
12 time would be?

13 A (Witness Owyong) No, I don't.

14 CROSS EXAMINATION (Continued)

15 BY MR. MICHAEL KOHN:

16 Q And according to Exhibit E to your testimony,
17 the only thing -- the reportability of the timing and
18 sensing functions -- excuse me, the repeatability of the
19 timing and sensing functions are affected by moisture,
20 correct?

21 A (Witness Owyong) According to this
22 literature, yes.

23 Q According to the manufacturer's specification.

24 A (Witness Owyong) That's correct.

25 Q And you're not doubting that to be the case,

1 are you?

2 A (Witness Owyong) No.

3 CHAIRMAN BLOCH: I'm sorry, are you still
4 referring to the same exhibit? Because I don't see what
5 you're referring to.

6 MR. MICHAEL KOHN: Exhibit E, under the heading
7 -- under "Specifications" down under "Air Supply
8 Preparation," then there's "Moisture" and it says "For
9 maximum repeatability of timing and sensing functions a dry
10 air supply is recommended."

11 CHAIRMAN BLOCH: Thank you.

12 BY MR. MICHAEL KOHN:

13 Q And in fact, as I just read, the vendor
14 supplying these elements specifically states that the
15 maximum repeatability of --

16 CHAIRMAN BLOCH: You just read that.

17 Q Now at the top of Exhibit E, the manufacturer
18 ARO references an ANSI standard, is that correct?

19 A (Witness Owyong) Yes, it does.

20 Q Does it appear to you that ARO adopts ANSI
21 standards in the course of conducting its business?

22 A (Witness Owyong) If it's on the literature, I
23 would say yes.

24 Q So would you then therefore believe that ARO
25 would endorse ANSI standard ISA S-7.3 for the operation of

1 the pneumatic logic controls to ensure maximum
2 repeatability of timing functions?

3 A (Witness Johnston) I read into this that it
4 only conforms with that standard.

5 A (Witness Owyong) Yes.

6 A (Witness Johnston) It doesn't say that they
7 adopt it, it simply says that their elements conform with
8 ANSI B 93.38.

9 BOARD EXAMINATION

10 BY CHAIRMAN BLOCH:

11 Q What does that mean to the user?

12 A (Witness Johnston) I would say that if the
13 user has a requirement to conform to that standard, that
14 they would be assured that these elements would not violate
15 that standard. That's my interpretation.

16 MR. MICHAEL KOHN: Your Honor, this is the
17 problem with having two witnesses testify. Mr. Owyong
18 sponsored that testimony, not Mr. Johnston.

19 CHAIRMAN BLOCH: So you can always ask Mr.
20 Owyong to also answer.

21 MR. BLAKE: We're trying to get accurate
22 information on the record, not trying to trap people or
23 "gotcha's" here. The idea is to try to provide as much
24 information to allow the Judges to make the right
25 determination.

1 BY CHAIRMAN BLOCH:

2 Q Mr. Owyong, do you have anything to add to
3 what Mr. Johnson said about the need for the user to
4 comply with the ANSI standard that's being referenced?

5 A (Witness Owyong) Well normally when we
6 receive a specification from a customer, our customer would
7 require certain specifications and then our job is to look
8 at our particular vendors to see if they have complied with
9 those particular specifications. And I would look at this
10 type of literature to say oh, yes, he has complied with the
11 ANSI standard.

12 Q So the vendor has complied with the ANSI
13 standard --

14 A (Witness Owyong) Yes.

15 Q The question I really want to focus on is what
16 consequence, if any, can the user expect to have if they
17 don't comply with the ANSI standard, if the user doesn't
18 comply. Or is it only a vendor standard?

19 A (Witness Owyong) It's a vendor standard, but
20 a requirement from the end user.

21 Q So would the purchaser of this equipment be
22 expected -- if they wanted to have high reliability of the
23 equipment, would they have to comply with the ANSI
24 standard?

25 A (Witness Owyong) Yes.

1 BY ADMINISTRATIVE JUDGE CARPENTER:

2 Q Can you tell me what the subject is of ANSI B
3 93.38?

4 A (Witness Cwyong) I can't, I would have to
5 look it up.

6 WITNESS JOHNSTON: Judge Bloch.

7 CHAIRMAN BLOCH: Off the record a second.

8 (Discussion off the record.)

9 CHAIRMAN BLOCH: Back on the record.

10 BY ADMINISTRATIVE JUDGE CARPENTER:

11 Q What I was trying to get back to was given that
12 this document identifies a particular ANSI standard, you
13 were then asked does that mean that this vendor complies
14 with all ANSI standards.

15 A (Witness Johnston) No, I do not believe it
16 does.

17 Q Because you were asked from this can you
18 conclude that another particular ANSI standard would be
19 complied with.

20 A (Witness Johnston) No, sir, I don't believe we
21 can.

22 ADMINISTRATIVE JUDGE CARPENTER: I was trying
23 to follow the logic of your answer -- the expertness of
24 your answer, if you will. I think perhaps it was spoken
25 too quickly.

1 CHAIRMAN BLOCH: Mr. Kohn spoke about a
2 particular standard. The number of that one is, Mr. Kohn?

3 MR. MICHAEL KOHN: S-7.3.

4 BY CHAIRMAN BLOCH:

5 Q And is it still your conclusion that the vendor
6 would probably comply with that 7.3?

7 A (Witness Owyong) Only if it's referenced on
8 this document or if the ANSI standard encompasses that
9 particular requirement.

10 Q You mean the ANSI standard that's referenced
11 here?

12 A (Witness Owyong) Yes.

13 Q And do we know?

14 A (Witness Owyong) I don't know.

15 Q So in other words, the whole subject discussion
16 we had was really in error.

17 A (Witness Owyong) Yes.

18 ADMINISTRATIVE JUDGE CARPENTER: Or at least
19 indeterminant.

20 WITNESS JOHNSTON I don't know if it was in
21 error or not. Again, you know, we supply our equipment to
22 many different end users. We may have to conform with ASME
23 standards, ANSI standards, ABS standards and we have to
24 review the specifications and then determine if our
25 equipment complies with those or if it does not comply with

1 them, we have to notify the purchaser of the exceptions and
2 then he has to determine whether those exceptions are
3 allowable or not.

4 Again, the way I read this, it says that these
5 elements comply with two standards, one is an ANSI and one
6 is an NFPA.

7 BY CHAIRMAN BLOCH:

8 Q But what can you say about whether or not you
9 do comply with ANSI 7.3?

10 A (Witness Johnston) From this document, I
11 cannot say that these comply with that.

12 Q Do you know whether or not they do?

13 A (Witness Johnston) No, sir.

14 A (Witness Owyong) I don't.

15 CROSS EXAMINATION (Continued)

16 BY MR. MICHAEL KOHN:

17 Q And I notice you have only one page of the
18 general -- I guess of a manual or whatever. Can you tell
19 me what Exhibit E comes from?

20 A (Witness Owyong) It came from just their
21 general manual that they have, the first couple of pages
22 stipulates just generality of the components and then the
23 rest of the manual goes into particular elements, a
24 description of the operation of the elements.

25 Q And did you review this manual in detail?

1 A (Witness Owyong) No.

2 Q Do you have the entire manual?

3 A (Witness Owyong) In my office.

4 MR. MICHAEL KOHN: We request that the entire
5 manual be made available, and the same with all the
6 documents attached to the exhibits.

7 MR. BLAKE: Judge Bloch, is there some
8 proffered need, is there some expectation, is there some
9 real reason? We can go through this harassment of requests
10 for such things, but is there some felt need, some
11 indicator here that there's been in appropriate use made of
12 this one page? I'll go find it, but doggone it --

13 CHAIRMAN BLOCH: This is not for our record,
14 it's for discovery, and I think --

15 MR. BLAKE: That's precisely my point.

16 BOARD EXAMINATION

17 BY CHAIRMAN BLOCH:

18 Q While we're on the subject of the manual, do
19 you have a pretty complete manual that's delivered to the
20 purchaser when they get the diesel?

21 A (Witness Owyong) I would say as far as the
22 engine itself, it's fairly complete. As far as the
23 auxiliary equipment, it depends on what you're looking for
24 in a manual. There are -

25 Q Suppose you were looking for detailed

1 instructions on how to calibrate a Calcon sensor.

2 A (Witness Owyong) I would say no.

3 BY ADMINISTRATIVE JUDGE CARPENTER:

4 Q How do you expect the owner to calibrate them?

5 A (Witness Owyong) Either the owner would
6 normally ask the vendor itself or ask us. The Volume 3
7 portion of that manual describes certain various components
8 that the owner can purchase those items, that was really
9 the basis of Volume 3, is just a specification section.
10 And at times, part of the sections, depending on the tech
11 writer, if he puts in the calibration sheets or not.

12 Q Are you testifying that Georgia Power could
13 have purchased from you a proper calibration manual?

14 A (Witness Owyong) Normally -- no. What I'm
15 saying is that if Georgia Power requested information on
16 calibration, that we more than likely would send it to
17 them. A lot of times we do not get information on
18 calibration of components, and so when particular items
19 come up that they want information on calibration, either
20 we have it in our office or we call our vendors and get
21 that information and just send it on to the customer.

22 Q How can you expect the owners to be able to
23 operate your equipment if they don't have the necessary
24 manuals?

25 A (Witness Owyong) Most of the components are

1 generic components and a qualified technician or
2 instrumentation person generally knows how to calibrate the
3 equipment. As a pressure switch, for instance, we don't
4 send calibration information on how to calibrate a pressure
5 switch. In fact, I don't even think some of our vendors
6 even have procedures on how to calibrate a pressure switch,
7 it's generic.

8 Q Do you make any suggestion to owners, in
9 particular ones who operate nuclear power plants, about the
10 qualifications of the technicians that are necessary?

11 A (Witness Owyong) No, we don't.

12 Q So it would seem to me this is sort of wishful
13 thinking, given no stated requirement. If you have a
14 technician who is trained in electronics who could repair a
15 TV set with no problem and give him your pneumatic control
16 systems, do you think he'd be successful?

17 A (Witness Owyong) More than likely not.

18 ADMINISTRATIVE JUDGE CARPENTER: Certainly our
19 record confirms what you just said.

20 CHAIRMAN BLOCH: Let's continue.

21 CROSS EXAMINATION (Continued)

22 BY MR. MICHAEL KOHN:

23 Q Now would it be normal and expected for a
24 manufacturer of pneumatic control systems and devices to
25 adopt ANSI standards on air quality?

1 A (Witness Owyong) Not necessarily.

2 Q I didn't -- obviously it's not necessary. My
3 question --

4 A (Witness Owyong) I said not necessarily.

5 Q I understand that. My question is would you
6 expect them to if they wanted to employ their devices in
7 the widest possible use?

8 A (Witness Owyong) No.

9 Q Is it your testimony that if a manufacturer did
10 not comply with the ANSI standards it wouldn't affect the
11 scope of their marketability for the product?

12 A (Witness Owyong) Being not a marketing type
13 person I would probably say no, because basically I look at
14 the quality of the product, not necessarily what
15 standards...

16 CHAIRMAN BLOCH: The witness has stated that
17 his answer is beyond his expertise.

18 BY MR. MICHAEL KOHN:

19 Q Are you aware that a end user (sic) may want or
20 have a requirement that this pneumatic device comply with
21 ANSI standards?

22 A (Witness Owyong) Yes.

23 Q Okay. And if the manufacturer did not comply
24 with it they wouldn't be able to distribute their products
25 to those users, would they?

1 A (Witness Owyong) That's correct.

2 Q And based on that, do you have an expectation
3 that the manufacturers would generally try to adopt ANSI
4 standards where possible?

5 A (Witness Owyong) Based on that, yes.

6 Q And can you think of any reason why the
7 pneumatic elements could not -- would not be able to comply
8 with ANSI standards.

9 MR. BLAKE: Objection. Asks for incredible
10 speculation. I don't even know how probative... "Can you
11 think of any answer why somebody wouldn't want to apply an
12 ANSI standard?" Is that the question?

13 CHAIRMAN BLOCH: Do you know whether or not the
14 air control system does comply with ANSI standard? WITNESS
15 JOHNSTON:

16 WITNESS OWYOUNG: Well, the air control -- what
17 do you mean by air control system?

18 CHAIRMAN BLOCH: Mr. Kohn, maybe you ought to
19 ask the question.

20 BY MR. MICHAEL KOHN:

21 Q Any portion of the air control system
22 associated with the diesel generator installed at Plant
23 Vogtle, are you aware of any component of that complying
24 with ANSI standards?

25 CHAIRMAN BLOCH: Complying or not complying?

1 MR. MICHAEL KOHN: Not complying.

2 CHAIRMAN BLOCH: Do you know of any part of the
3 air control system for the diesel that does not comply with
4 ANSI standards?

5 WITNESS OWYOUNG: Basically, I don't know of
6 any component that does comply with it.

7 MR. BLAKE: Judge, there are lots of ANSI
8 standards.

9 CHAIRMAN BLOCH:

10 CHAIRMAN BLOCH: I'm sorry, it's a particular
11 standard we're talking about, though. It's -- Mr. Kohn,
12 the number is...?

13 ADMINISTRATIVE JUDGE CARPENTER: Mr. Kohn, I
14 really object to such a question. Do you know how many
15 ANSI standards there are?

16 MR. MICHAEL KOHN: Yes.

17 CHAIRMAN BLOCH: He was asking about a
18 particular standard, though.

19 MR. MICHAEL KOHN: S-7.3.

20 ADMINISTRATIVE JUDGE CARPENTER: Well, be
21 specific in the question, please, sir.

22 CHAIRMAN BLOCH: It -- it was my question that
23 was not specific. I'm sorry about that. Is there any
24 portion of the air control system that you know that does
25 not comply with ANSI standard S-7.3?

1 WITNESS OWYOUNG: Well, I'll have to answer
2 that in the positive -- or negative way saying that I don't
3 know of any component that does comply with it.

4 CHAIRMAN BLOCH: Thank you.

5 BY MR. MICHAEL KOHN:

6 Q And when is the first time you saw ANSI
7 standard S-7.3?

8 A (Witness Owyong) Maybe, I don't know, ten, 15
9 years ago. I don't know.

10 CHAIRMAN BLOCH: Mr. Kohn, where -- what's the
11 proffer on what the relevance of this is now? I mean, I
12 understood that you were trying to show that the -- that
13 this does comply with S-7.3. But once you found that they
14 don't think any of it does, I'm not sure why when he first
15 learned about the standard is going to be relevant.

16 WITNESS JOHNSTON: Is the question: Does the
17 component comply with 7.3? Or: Does the component require
18 7.3?

19 MR. MICHAEL KOHN: Require.

20 WITNESS JOHNSTON: There's nothing here that
21 indicates that these components require air complying with
22 the requirements of ANSI 7.3 to function.

23 WITNESS OWYOUNG: Right.

24 CHAIRMAN BLOCH: So let's get on to another
25 field.

1 BY MR. MICHAEL KOHN:

2 Q How small are the passages within the logic
3 elements found on the Plant Vogtle diesel?

4 A (Witness Owyong) I would say the smallest
5 passage would probably be maybe a sixteenth of an inch.

6 CHAIRMAN BLOCH: If the witnesses want, they
7 can always refer to their direct testimony and just give a
8 citation to it. I think that that was answered...

9 WITNESS OWYOUNG: No, I didn't mention -- I
10 didn't mention the passage.

11 CHAIRMAN BLOCH: All right, thank you.

12 WITNESS OWYOUNG: In my testimony.

13 BY MR. MICHAEL KOHN:

14 Q One sixteenth of an inch?

15 A (Witness Owyong) Yes.

16 Q That's the smallest passages within a logic
17 element?

18 A (Witness Owyong) Other than getting the
19 actual drawings of the components, I have never measured
20 any of the passages.

21 CHAIRMAN BLOCH: I'm sorry, so you're relying
22 on the measurements in the drawings, is that right?

23 WITNESS OWYOUNG: No, what I'm doing is relying
24 on my past experience of just...

25 CHAIRMAN BLOCH: What you saw?

1 WITNESS OWYOUNG: ...comparing components and
2 just looking at them.

3 BY MR. MICHAEL KOHN:

4 Q Is the timing of events within the logic during
5 the diesel start-up cycle, specifically within the first 60
6 seconds, of great importance to the successful operation of
7 the diesel?

8 A (Witness Owyong) Say that again.

9 Q Is the timing of events within the logic during
10 the successful starting of the diesel, specifically within
11 the first 60 seconds, of great importance to whether or not
12 the diesel will successfully operate?

13 A (Witness Owyong) I'll -- first 60 seconds,
14 I'll say no.

15 Q A little bit beyond 60 seconds, at that
16 interval?

17 A (Witness Johnston) At approximately 60 seconds
18 the Group 2 devices become active. If that time were
19 delayed beyond 60 seconds that would not be critical.
20 Those devices are delayed approximately 60 seconds because
21 they are associated with fluid systems that require
22 operation of the engine to develop pressure and it usually
23 takes -- for a nuclear engine it usually takes on the order
24 of ten to -- ten to 20 seconds for these pressures to
25 become satisfied. So the 60 seconds provides some

1 conservatism for locking out those devices. Again, if it
2 -- if it extends beyond 60 seconds it does not have any
3 detriment to the start or the operation of the engine, only
4 to its protection.

5 Q Is that your understanding, Mr. Owyong?

6 A (Witness Owyong) Yes.

7 Q Well -- well, if the timing is messed up can't
8 the engine trip after 60 seconds?

9 A (Witness Owyong) Only -- no, if the timing is
10 messed up... Meaning that it doesn't time out?

11 Q Correct.

12 A (Witness Owyong) If it doesn't time out, what
13 that means is basically the engine would not trip; that the
14 unit -- the Group 2 units are still locked out.

15 Q That certain portions don't pressurize, would
16 it trip?

17 A (Witness Owyong) No.

18 Q Can you have a trip of the diesel generator
19 occurring as a result of failure to pressurize any of the
20 trip lines?

21 A (Witness Owyong) If the timing -- if the 60
22 second timing does not time out, the Group 2 shutdowns will
23 not trip, cause a trip, and they can still be vented
24 throughout that period of time.

25 A (Witness Johnston) Mr. Kohn, you're mixing

1 functions here. You started talking or implying that you
2 were talking about the Group 2 lockout circuitry, and then
3 you said "Will venting of the system cause a shutdown?"
4 Venting of sensors will cause shutdowns if they are active.
5 If you don't time out the Group 2, then venting of the
6 Group 2 sensor will not cause a shutdown.

7 Q Lack of pressurization is -- is what I'm
8 looking at.

9 A (Witness Johnston) But again it depends on
10 which specific function of the control system you're
11 referring to, whether that will cause a shutdown or not.

12 Q Lack of pressurization of certain portions of
13 the logic will result in a shutdown?

14 A (Witness Owyong) What logic -- the logic
15 board, itself, or the components, or the sensors? The
16 problem -- the problem I'm having is...

17 Q Of the trip lines?

18 A (Witness Owyong) Would trip lines, Group 1 or
19 Group 2s?

20 Q Either. Tell me...

21 A (Witness Owyong) Okay, if you have a lack of
22 pressurization of the Group 1s, it will cause a shutdown;
23 the Group 2s would not cause a shutdown.

24 Q And Group 1 is what?

25 A (Witness Owyong) Group 1s are shutdowns that

1 have to be pressurized before you allow it to start.

2 Q And what are those?

3 A (Witness Owyong) If memory serves me
4 correct,...

5 Q In 1990 at Plant Vogtle. I know there was a
6 design modification after that.

7 A (Witness Owyong) Yeah. I...

8 A (Witness Johnston) That would be overspeed
9 protection, main bearing temperature protection.

10 A (Witness Owyong) Main bearing, yes. I think
11 there's one more, but I can't remember. I would have to
12 again...

13 A (Witness Johnston) Lube oil temperature.

14 A (Witness Owyong) Probably lube oil. I would
15 have to look at the schematics to determine what would be
16 Group 1s versus Group 2s.

17 Q Well, do you know whether jacket water
18 temperature would be a Group 1 or Group 2 at this point?

19 A (Witness Owyong) Jacket water temperature is
20 a Group 2.

21 Q In 1990, at the time of the site area
22 emergency?

23 A (Witness Owyong) Yes.

24 Q If the timing logic is interfered with by
25 either air leakage or obstruction of orifices, can the

1 diesel experience a trip?

2 A (Witness Owycung) Which timing logic, the
3 Group 1 lockout?

4 Q Any.

5 A (Witness Owyong) I would say no.

6 Q So you could restrict the air flow of any
7 orifice and the diesel would not experience a trip?

8 A (Witness Owyong) Of the timing logic, yes.

9 Q At any point...

10 A (Witness Owyong) Excuse me. The Group 1s --
11 again, if the Group 1s vented it would create a trip.

12 Q Not vented.

13 A (Witness Owyong) Just -- just the orifice
14 timing was blocked, is that the question?

15 Q That's right.

16 A (Witness Owyong) No, it would not. No.

17 Q Well, is it your testimony, then, within the
18 logic board you could completely cut off the air flow to
19 any particular given orifice and there would be no effect
20 on the operation of the diesel?

21 A (Witness Owyong) No, if you -- if you cut --
22 maybe I said that wrong. If you cut off the air to the
23 Group 2 timing during the start-up period, yes, that could
24 cause a trip because it would not allow the -- the fluid
25 systems to come up to pressure. Did I say that right? No,

1 excuse me. excuse me.

2 CHAIRMAN BLOCH: Could I suggest that when
3 questions are asked that you hesitate a little longer,
4 think about the implications, and if you don't know what
5 the question is, ask for a clarification.

6 WITNESS OWYOUNG: Okay.

7 CHAIRMAN BLOCH: Because we're having
8 difficulty communicating here, I think.

9 WITNESS OWYOUNG: Okay. Let's start over
10 again. Ask the question again.

11 CHAIRMAN BLOCH: Yeah, and you also may discuss
12 it between the two of you, if that would improve the
13 answer.

14 WITNESS OWYOUNG: Right.

15 MR. MICHAEL KOHN: But I -- but those
16 discussions would be on the record. All right.

17 CHAIRMAN BLOCH: Since there's no objection,
18 they can discuss it so that everyone can hear, yes.

19 BY MR. MICHAEL KOHN:

20 Q If the air supply was cut off to the orifices,
21 could that cause a trip?

22 A (Witness Owyong) If the air supply was cut
23 off to the orifice you would not time out on a Group 2
24 lockout, so you would not cause a Group 2 trip. But if you
25 -- if the air was cut off to the -- during that period of

1 start-up time you would not have a stop signal, so the air
2 to that portion of the circuitry would be vented at that
3 time, regardless. So the answer would be no.

4 CHAIRMAN BLOCH: Is there any ambiguity as to
5 which orifice or orifices the question was about?

6 WITNESS OWYOUNG: There are two orifices --
7 there are two timing circuits on that logic board. One is
8 a Group 2 lockout period, and one is a shutdown. And those
9 are both six-thousandths orifices.

10 CHAIRMAN BLOCH: And is your answer with
11 respect to both orifices?

12 WITNESS OWYOUNG: That is correct.

13 BY MR. MICHAEL KOHN:

14 Q The air was restricted to the orifices after 60
15 seconds, what would happen? Any orifice. Could it result
16 in a trip?

17 A (Witness Johnston) Show him -- do you need a
18 schematic to answer these questions?

19 A (Witness Owyong) It'll make the questions --
20 yeah, it'll make it easier, because I'm just going the
21 memory right now.

22 CHAIRMAN BLOCH: Okay, I think it would be
23 helpful. I think the staff has a schematic as an exhibit,
24 is that correct? Or we have a schematic as an exhibit. Or
25 it was attached to one of the motions for summary

1 disposition or to one of the responses. I know, it was
2 attached to a staff report on...

3 MS. YOUNG: I think the witness indicated that
4 in preparing for his testimony at some point he looked at a
5 schematic, and maybe that's what he needs to refer to...

6 CHAIRMAN BLOCH: Do you know -- do you know
7 where to find the schematic that you need to look at?

8 WITNESS JOHNSTON: If you have an engine
9 instruction manual it would be attached with the drawings
10 to that book.

11 MS. YOUNG: Gentlemen, you have to understand,
12 we don't have everything that you have. What the Board
13 referred to is a simple diagram that was appended to the
14 back of a staff exhibit.

15 CHAIRMAN BLOCH: Let's take a ten -- let's take
16 a ten minute break, during which you can show the people
17 the memo, and if -- if they -- if it's not helpful or it
18 won't be helpful we'll clarify that when we come back.

19 MS. YOUNG: I don't believe it'll be
20 sufficient, Judge Bloch. He needs the schematic that he
21 looked at.

22 ADMINISTRATIVE JUDGE CARPENTER: That's not a
23 vendor-approved schematic.

24 MS. YOUNG: That's right.

25 (A short recess was taken.)

1 CHAIRMAN BLOCH: The hearing will come to
2 order.

3 MR. BLAKE: Judge Bloch, during the break the
4 witness has expressed some concerns about the clarity of --
5 their ability to understand the questions. And -- and so
6 what we've done is made copies of one page out of the Casto
7 memorandum which had earlier been marked as a staff
8 exhibit, II-5, so there's not a need to mark this. It's
9 all easily -- this happens to be Figure 2. The witness has
10 told me it didn't matter which of the figures they used,
11 just so that the questioner and they will have available to
12 them what the schematic is, so that they can refer more
13 specifically. This is a complex system, and they can --
14 the questioner can refer more specifically to particular
15 components in the system when the questions are asked so
16 that the record will be clear.

17 CHAIRMAN BLOCH: And Intervenor has no problem
18 with that?

19 MR. MICHAEL KOHN: Well, there's a series of
20 these schematics that show what's happening over time, and
21 I think that should also be...

22 MR. BLAKE: That's already in the record by
23 virtue of -- of having marked the Casto exhibit. But I
24 asked the witnesses whether or not any one of them would
25 make a difference to them and they said no, it depends on

1 the question. This just allows them to refer to specific
2 components in the system, not the condition of the
3 component in a particular point in time. That would be
4 obviously a function of the question.

5 CHAIRMAN BLOCH: So just for -- it doesn't -- I
6 guess the components are the same in all the drawings,
7 right?

8 MR. BLAKE: That was my understanding, yes.

9 CHAIRMAN BLOCH: So, Mr. Kohn, if you would,
10 just let's be looking at the Caster exhibit, Staff II-5.

11 MS. YOUNG: We just made that available to the
12 witnesses. They have it at the table. So if Intervenor's
13 concerned that they have a series of drawings, I believe
14 they have that at their disposal.

15 CHAIRMAN BLOCH: So during this questioning
16 we'll all be looking at one of the figures. I have it at
17 Figure 2, but it doesn't matter since the components are
18 the same. Let's -- let's proceed with the questioning.

19 BY MR. MICHAEL KOHN:

20 Q All right, if the timing logic is interfered
21 with by either -- by blockage of an orifice, can the diesel
22 generator experience a trip?

23 A (Witness Owyong) Which orifice? The...

24 Q Any orifice.

25 A (Witness Owyong) Port 9 is -- is the

1 maintenance lockout. If that was blocked there, then that
2 doesn't pressure that up, hence that times out. Yes. The
3 answer is yes.

4 BOARD EXAMINATION

5 BY CHAIRMAN BLOCH:

6 Q It could block it?

7 A (Witness Owyong) Yes. If -- if Orifice 8 is
8 blocked it could cause a trip.

9 Q All right, now, let's think about this in a --
10 both a static and a dynamic sense. If there were water
11 blocking that orifice would it stay there or would it later
12 move?

13 A (Witness Owyong) The -- you would have 60
14 pounds -- 60 psi pressure against that orifice, and I would
15 -- I would say that it would blow through unless it
16 corrodes up.

17 Q So if that's the case, would this affect
18 whether or not the diesel would trip, or would it just
19 affect the timing?

20 A (Witness Owyong) On that -- on Orifice 8, if
21 the Orifice 8 was affected I would say that it would affect
22 the engine from starting. Orifice 8 is the orifice that --
23 that pressurizes the Group 2 sensors.

24 CROSS EXAMINATION (Continued)

25 BY MR. MICHAEL KOHN:

1 Q Did you say starting or continuing to run?

2 A (Witness Owyong) Starting.

3 Q Would...?

4 A (Witness Owyong) Yeah, you won't be
5 pressurizing the system.

6 CHAIRMAN BLOCH: Okay, I think the -- the
7 ground rules, they -- they want you -- to encourage you to
8 discuss this. But so that everyone can understand... 'cause
9 there's obviously some confusion... it would be better that
10 we could all hear it on the record as to what you're
11 saying.

12 WITNESS JOHNSTON: I'm sorry, my microphone was
13 off. I was simply questioning Sheldon's statement on
14 whether it would affect the actual start or continue to
15 run.

16 WITNESS OWYOUNG: Well, if the orifice is --
17 Orifice 8 is -- is plugged it would not charge the Group 2s
18 after the Group 2 lockout has timed out, it would create a
19 shutdown.

20 WITNESS JOHNSTON: Okay. But the engine would
21 actually start and run until...

22 WITNESS OWYOUNG: The 60 seconds.

23 WITNESS JOHNSTON: ...until the -- the timer?

24 WITNESS OWYOUNG: Right.

25

BOARD EXAMINATION

1 BY ADMINISTRATIVE JUDGE MURPHY:

2 Q Gentlemen, just so I'm all -- I'm calibrated
3 while I'm looking at this schematic, where is the source
4 air in this schematic? Where does it come from?

5 A (Witness Owyong) This is only a portion of
6 the logic board, so you really don't see the source air.
7 Basically, I would say per this portion of it, the source
8 air is coming from Port 9 or Item 9 on the upper left-hand
9 corner.

10 CROSS EXAMINATION (Continued)

11 BY MR. MICHAEL KOHN:

12 Q And 10?

13 A (Witness Owyong) 10 would be a signal, start
14 signal or whatever. Again, I would have to see the
15 complete circuit.

16 Q After 60 seconds, would the blockage of any of
17 the orifices on the document you've been looking at affect
18 the operation of the diesel?

19 A (Witness Owyong) No.

20 Q Would the same response be true if there were
21 air leaks, a significant air leak?

22 A (Witness Owyong) During what condition, now?

23 Q When the diesel is running.

24 A (Witness Owyong) The diesel is running
25 and...?

1 Q After 60 seconds the diesel is running; if an
2 orifice was blocked and in the portion following the
3 block...

4 CHAIRMAN BLOCH: Okay, which orifice? Are we
5 saying...?

6 MR. MICHAEL KOHN: Any orifice.

7 CHAIRMAN BLOCH: Well, 8 is the one we're
8 concerned about before. Is that the one you want to
9 continue with or not?

10 MR. MICHAEL KOHN: I think 15 would also be
11 applicable. Let me rephrase the question.

12 BY MR. MICHAEL KOHN:

13 Q After the diesel is running and -- and Orifice
14 15 or Orifice 8 is blocked, if there is an air leak between
15 the blockage and the Group 2 shutdown lines, trip lines,
16 could that result in a trip of the diesel?

17 A (Witness Owyong) Say that one more time,
18 please.

19 Q If either Orifice 15 or Orifice 8 is blocked
20 after 60 seconds, and there is a leak in the tubing, after
21 the blockage, leading to the Group 2 shutdown, could that
22 result in a trip of the diesel?

23 A (Witness Johnston) Sheldon, if we blocked this
24 orifice...

25 A (Witness Owyong) This is...

1 A (Witness Johnston) ...it's going to maintain a
2 signal to this AND element (phonetic). We're still going
3 to...

4 A (Witness Owyong) But not necessarily if -- if
5 that just leaks down.

6 A (Witness Johnston) No, but he's saying -- he's
7 saying that it leaks here.

8 A (Witness Owyong) Uh-huh (affirmative).

9 A (Witness Johnston) So we've held this, we're
10 flowing through AND 14. Isn't that keeping that line
11 charged?

12 A (Witness Owyong) If this -- if this vents
13 here...

14 CHAIRMAN BLOCH: Okay, when you're pointing to
15 something it'd be best to -- to indicate what you're
16 pointing to.

17 A (Witness Owyong) Okay, if the Group 2 -- if
18 the Group 2 vents, it will vent down the -- the B port of
19 AND 14, regardless if -- if this is blocked or not, seeing
20 that is still pressurized. So -- so under the condition
21 that if 15 is -- is blocked, that the pressure is -- is
22 trapped after that orifice, then if the Group 2s does vent
23 it would create a shutdown.

24 Q Or if there's a -- a leakage in fittings it
25 could also result in a shutdown?

1 A (Witness Owyong) Well, leakage of fitting is
2 a vent, yes.

3 Q Thank you.

4 A (Witness Johnston) Does it require a
5 significant leakage, or if we have again a situation of
6 one-to-three bubbles a second? Can we maintain, we makeup?

7 A (Witness Owyong) The -- that's the purpose of
8 the Orifice 5 is -- is the makeup.

9 Q 15, you mean?

10 A (Witness Johnston) 5.

11 A (Witness Owyong) 5. The 20-thousandths
12 orifice. So -- so the flow -- the vent has to be larger
13 than the 20-thousandths orifice there to cause the...

14 A (Witness Johnston) The circuit to trip.

15 CHAIRMAN BLOCH: Now, are you considering
16 whether or not water would ultimately blow through? Does
17 that affect any of this?

18 WITNESS OWYOUNG: If water blows through, no.
19 The system would act -- act normal. It would -- if, again,
20 the Group 2 trip lines has a leak greater than 20-
21 thousandths, the system will trip.

22 WITNESS JOHNSTON: The system was designed to
23 -- to tolerate line leakage through this makeup orifice.
24 And that -- one of the things that we did on site, when
25 discussing leakage, was to put on a demonstration of what a

1 six-thousandths leak looks like in the bubbler. And
2 because we had been talking about leakage rates yesterday
3 and at the site of one-to-three bubbles per second, we put
4 a six-thousandths orifice in there, applied 60 pounds of
5 pressure to it, and -- and observed a rapid boil of water
6 in the bubble chamber, which is what made everybody feel
7 much more comfortable about the presence of these
8 relatively low leakage rates.

9 BOARD EXAMINATION

10 BY ADMINISTRATIVE JUDGE CARPENTER:

11 Q As -- as I understood the observational program
12 that you had, Mr. Johnston, you did not run a bubble test
13 before Licensee had repaired many of the leaks, is that
14 correct?

15 A (Witness Johnston) That is -- that is my
16 recollection.

17 Q So the, quote, "as found" is -- is
18 indeterminate; you weren't there in time to find it.

19 A (Witness Johnston) Again, I'm comparing the
20 statements yesterday of the one-to-three bubbles per
21 second, which again, to my recollection, was after they had
22 snoopied and tighten@d fittings. I'm -- I'm really not
23 certain of the sequence of events there.

24 ADMINISTRATIVE JUDGE CARPENTER: I'd like to
25 ask Intervenor why we're asking questions about orifices

1 being blocked, as though some workman who left his socks in
2 the lines (sic). I'm asking the man who's asking the
3 questions. They're answering the questions.

4 CHAIRMAN BLOCH: But he's not a witness.

5 ADMINISTRATIVE JUDGE CARPENTER: I'm asking him
6 why that's the focus of his questions.

7 MR. MICHAEL KOHN: To indicate the effect of
8 water or debris in the trip -- in the logic.

9 ADMINISTRATIVE JUDGE CARPENTER: So that you're
10 more focused on the dynamics of the situation rather than
11 any static condition?

12 MR. MICHAEL KOHN: Yes.

13 ADMINISTRATIVE JUDGE CARPENTER: So let's make
14 the questions dynamic.

15 MR. MICHAEL KOHN: I'd just like to address,
16 there -- I was planning to get to that area later, but
17 before I did so I wanted to qualify the witnesses, whether
18 they are qualified to answer as an expert in that area.
19 But I would like to call the witnesses' attention to J-11.

20 MR. BLAKE: Do you feel you've qualified them
21 as experts on this system now?

22 MR. MICHAEL KOHN: No.

23 BY MR. MICHAEL KOHN:

24 Q I'd like to call the witnesses' attention to
25 NUREG 1410, Appendix J, at J-11.

1 A (Witness Johnston) Those exhibits were taken
2 back from us yesterday. We don't have them.

3 (The witnesses were handed certain material.)

4 Q If you look at the last paragraph on J-11, and
5 I'm focusing about halfway down on the left, you'll see it
6 begins, "A continuous makeup..."

7 A (Witness Owyong) Yes.

8 Q And this is referring to an 006 orifice rather
9 than a .020 orifice, correct?

10 A (Witness Owyong) That's correct.

11 Q Is the NUREG referring to something else, or
12 has the .02 orifice been changed out?

13 A (Witness Owyong) It's referring to something
14 else.

15 Q And what is the NUREG referring to?

16 A (Witness Owyong) It's referring to orifices
17 that are connected to each of the trip lines.

18 Q Are they on this schematic that we're looking
19 at?

20 A (Witness Owyong) No, they're not.

21 CHAIRMAN BLOCH: Excuse me. Does that mean
22 that there's redundant makeup?

23 WITNESS OWYONG: Yes. The six-thousandths
24 orifice were installed to compensate the line leakage.

25 MR. MICHAEL KOHN: We're facing a position

1 where we don't have a diagram which shows what the witness
2 is referring to, and it makes the questioning impossible.

3 CHAIRMAN BLOCH: Are you complaining about some
4 problem in discovery?

5 MR. MICHAEL KOHN: Yes, Your Honor, and it's
6 not -- the situation is, when experts testify you are
7 entitled to see all the documentation they relied on to
8 prepare their testimony; they said they relied on such a
9 schematic. It was never produced.

10 CHAIRMAN BLOCH: Well, what I'm hearing is that
11 this also is prerequisite to an understanding of how the
12 system actually works, and that without it there's no basis
13 for Mr. Mosbaugh's testimony on this subject, either.

14 MR. MICHAEL KOHN: Mr. Mosbaugh's testimony was
15 struck.

16 CHAIRMAN BLOCH: His testimony on -- on the
17 effect of moisture in the pneumatics was struck? I don't
18 recall that. I don't recall that, but it may soon be
19 struck. What you're saying to me, Counselor, is that at
20 this point the speculations on what moisture would do to
21 the logic system were based on incomplete information on
22 behalf of Intervenor.

23 MR. MICHAEL KOHN: No, Your Honor.

24 CHAIRMAN BLOCH: Well, then, you should be able
25 to question these witnesses, based on what you know,

1 because it's complete enough to have testified.

2 MR. MICHAEL KOHN: Your Honor, I'm not an
3 engineer.

4 CHAIRMAN BLOCH: But your -- but your -- your
5 client is. If your client didn't have the information on
6 which to make conclusions about what would happen with
7 moisture in the logic system, then we should strike that
8 testimony.

9 MR. MICHAEL KOHN: It has the same effects with
10 the other orifices, Your Honor. There's -- there's no
11 difference.

12 CHAIRMAN BLOCH: No, what I'm saying is that in
13 order to know the effect of moisture on the logic system
14 you have to know about the entire schematic to know whether
15 or not you have to block redundant supplies of air, and
16 whether that's at all likely with moisture going through
17 the system.

18 BY MR. MICHAEL KOHN:

19 Q Did you indicate that this was something that
20 was added to the system?

21 A (Witness Owyong) During what time?

22 Q 1990?

23 A (Witness Owyong) No, this -- this was
24 installed. Those particular orifices were installed at
25 that period of time.

1 Q What period of time?

2 A (Witness Owyong) 1990.

3 CHAIRMAN BLOCH: You mean they were there in
4 1990. Do you know about when they were installed?

5 WITNESS OWYOUNG: Those particular orifices
6 were installed I think during start-up.

7 BY MR. MICHAEL KOHN:

8 Q Were the orifices changed out during start-up,
9 the sizes of the orifices?

10 A (Witness Owyong) Which one, the six-
11 thousandths?

12 Q Were orifice sizes changed out in 1990?

13 A (Witness Owyong) Any orifice? I'm confused.
14 I don't know which orifice you're -- you're referring to.

15 Q Any of the orifices on Figure 2 that you have
16 in front of you?

17 A (Witness Owyong) That was not changed out
18 during that time.

19 A (Witness Johnston) I think as a result of our
20 work following the March 1990 event, Orifice Number 5 was
21 changed from 28-thousandths to 20-thousandths, is that
22 correct, Sheldon?

23 A (Witness Owyong) Yes, after the 1990.

24 CHAIRMAN BLOCH: Off the record.

25 (A discussion is held off the record.)

1 BY MR. MICHAEL KOHN:

2 Q Now, if I -- your earlier testimony about the
3 blockage of Orifice 15 and Orifice 8 remains the same,
4 correct?

5 A (Witness Owyong) Pertaining to...?

6 Q Your previous testimony about the effects of
7 blockages of those orifices?

8 A (Witness Owyong) Yes.

9 Q And after 60 seconds, if a blockage of a supply
10 at Number 9 on Figure 2 occurred, what would be the effect?

11 A (Witness Johnston) Could you get air to the
12 shutdown cylinder?

13 A (Witness Owyong) I'm sorry, this schematic
14 again is not complete. On AND 9 I would have to know where
15 the rest of the shutdown circuit is connected to -- in
16 relationship to that AND 9.

17 A (Witness Johnston) We have to flow -- we have
18 to flow air to the shutdown cylinder to be able to shut the
19 engine down. If you can't get air pressure up to that
20 shutdown cylinder it will run until it self-destructs.

21 A (Witness Owyong) So, again, I -- I can't
22 answer the question 'cause I don't remember exactly where
23 the rest of the logic is if you block AND 9.

24 Q So you don't know the answer to the question?

25 A (Witness Owyong) No.

1 Q And if I understand it, failures of the diesels
2 during the site area emergency occurred at a point in time
3 when the operation of the 60 second start-up logic would be
4 called into operation after it had timed out?

5 A (Witness Owyong) Say that again, please.

6 Q The diesel failures which occurred during the
7 site area emergency represent -- occurred at a point in
8 time after the 60 second timer timed out?

9 A (Witness Owyong) That is correct.

10 Q And therefore, if water was blocking the
11 orifices, you indicated at that point in time it could
12 result in a trip of a diesel during the site area
13 emergency?

14 A (Witness Johnston) I don't think you said
15 that, Sheldon.

16 A (Witness Owyong) This is after the 60 second
17 time out?

18 Q Yes.

19 A (Witness Owyong) After the 60 second time
20 out, if water blocked the orifices, and you stated that if
21 we had a leak in the Group 2 shutdowns, yes, it would
22 create a shutdown.

23 ADMINISTRATIVE JUDGE CARPENTER: Are you
24 thinking about liquid water or solid water?

25 WITNESS OWYONG: That was a question to me?

1 CHAIRMAN BLOCH: That was in fact a question,
2 yes.

3 WITNESS OWYOUNG: It was a question to me?

4 ADMINISTRATIVE JUDGE CARPENTER: Yes. You said
5 if water blocked the orifice.

6 WITNESS OWYOUNG: Well, that's...

7 ADMINISTRATIVE JUDGE CARPENTER: Are you
8 postulating ice or -- or liquid water?

9 WITNESS OWYOUNG: Well, I have a hard problem
10 just looking at it saying water will block an orifice. But
11 this is a question that's asked of me, if the orifice is
12 plugged by water

13 WITNESS JOHNSTON: I think what we're -- I
14 think the way that we're -- we're understanding that
15 question is if the orifice is blocked.

16 BOARD EXAMINATION

17 BY CHAIRMAN BLOCH:

18 Q Now, how does it change if, instead of being
19 blocked, there's a slug of water let's say two and a half
20 feet long which moves through it, what's going to happen?

21 A (Witness Owyong) If it moves through it, what
22 it would probably do is change the timing because it'll
23 change the volume.

24 Q Meaning that the diesel would still trip or it
25 would not trip or what?

1 A (Witness Owyong) If it moves through it and
2 still allow the systems to come up, being active, then it
3 would not trip.

4 Q What does that mean, it would still allow the
5 systems to come up and be active?

6 A (Witness Owyong) Meaning that the liquid
7 systems, like the lube oil pressure, the jack water
8 pressures that allow the systems to come up and -- and
9 trigger or pressurizes the shutdown circuits, then the
10 systems are active. That's the only purpose of the -- the
11 timing circuit here.

12 BOARD EXAMINATION

13 BY ADMINISTRATIVE JUDGE CARPENTER:

14 Q If the Board understands your -- your
15 testimony, by "come up" you mean pressurize?

16 A (Witness Owyong) Pressure -- pressurize,
17 excuse me. Yes.

18 Q Reach the static pressure which is considered
19 the operating condition in each of those trip lines?

20 A (Witness Owyong) That is correct.

21 Q Thank you.

22 A (Witness Johnston) It's a really difficult
23 question because the water is going to slow the response of
24 the system. It's going to slow the -- it's going to slow
25 the filling of the lines to the individual sensors, but at

1 the same time it's going to slow the charging of the
2 accumulator which times out the Group 2 trips. So you end
3 up in essentially a relay race there where you're trying to
4 -- you know, what's going to occur first? And that's very
5 difficult to answer. But we're charging the accumulator
6 through a smaller orifice than we're charging the lines to
7 the sensors. It's -- it's quite possible that the effect
8 is going to be essentially one of simply delaying or
9 slowing the -- the function of the whole circuit, but do it
10 about -- in proportion to what it would do with free-
11 flowing air. It's -- it's just very difficult to answer.

12 CROSS EXAMINATION (Continued)

13 BY MR. MICHAEL KOHN:

14 Q So you couldn't predict where the water would
15 have its effect or where -- or what the greatest effect of
16 the water would be?

17 A (Witness Johnston) I would say we could expect
18 that the water is going to affect the smaller orifices
19 greater than it will the larger orifices. Therefore, I
20 would expect that it will slow the filling of the
21 accumulator and the lockout period more than it would other
22 functions of the logic. And since the diesel tripped
23 within the 70 to 80 second time frame, that suggests that
24 that six-thousandths orifice was not affected by the
25 presence of water.

1 A (Witness Owyong) That's correct.

2 Q But you cannot predict where the water would be
3 in the circuit? That's one postulation where it would be,
4 but if it was somewhere else your answer would be that...?

5 A (Witness Owyong) Well, if the water was
6 coming from Element 9 then it would affect both Orifice 15
7 and 8.

8 Q And affecting 15 and 8 could result in a trip
9 of the diesel?

10 A (Witness Owyong) Again, during what period of
11 time?

12 Q After 60 seconds.

13 A (Witness Owyong) Well, Orifice 6 is the
14 orifice that gives you the 60 seconds.

15 A (Witness Johnston) Orifice 15.

16 A (Witness Owyong) Excuse me, Orifice -- excuse
17 me, Orifice 15 gives you the 60 second time.

18 Q After 60 seconds?

19 A (Witness Johnston) I think we said after --
20 after 60 seconds, if we block Orifice 15 then...

21 A (Witness Owyong) Yes, after 60 seconds, if
22 you block Orifice 15 and you do have a leak in the Group 2
23 shutdowns that is greater than 20-thousandths, it will
24 create a shutdown.

25

BOARD EXAMINATION

1 BY CHAIRMAN BLOCH:

2 Q And, gentlemen, if we were to assume for a
3 second that we had 80 degree dew point air in this system,
4 just for a hypothetical, and that the temperature in the
5 system was 70 degrees or maybe even -- let's assume 70 or
6 60 degrees...let's even 60 degrees (sic) ...is there any
7 way to put an upper bound on the amount of water we might
8 find in the system?

9 A (Witness Johnston) It's going to accumulate in
10 that filter regulator before we -- before we expect it to
11 accumulate in the logic functions.

12 Q Okay, so it would accumulate there first. Is
13 there any way to put an upper bound on how much water might
14 accumulate, under the hypothetical, in the logic system?

15 A (Witness Owyong) I don't think so. At least
16 I can't.

17 BY ADMINISTRATIVE JUDGE MURPHY:

18 Q You say it accumulates in the filter regulator.
19 Hypothesize that the filter bowl fills up with water and
20 the water starts getting through the five micron filter.
21 Can you conceive of a way then of the water getting to
22 these orifices in a way to block the orifices?

23 A (Witness Owyong) That would be the only way
24 that water would get to these orifices, that scenario.

25 Q If that happened, would there be some other

1 indication of that?

2 A (Witness Owyong) Well, I would think that the
3 moisture would attack the orifices and eventually close up
4 the orifices.

5 A (Witness Johnston) I think -- I believe now
6 that we're talking about such a large quantity of water
7 that eventually you're going to lead to a complete shut --
8 excuse me -- you're going to eventually lead to a complete
9 logic board failure. I mean you're going to mess up the
10 logic so badly it's not going to work. And the shutdown --
11 the logic boards have to send a pneumatic signal to the
12 shutdown cylinder to shut the engine down. So if we lock
13 up the logic boards with such a large quantity of water,
14 we're not going to be able to shut the engine down under
15 any circumstance except for the engine physically running
16 out of fuel or coming apart. It's what we term a fail
17 dangerous system because under normal non-nuclear
18 applications, we try to design the system to fail safe so
19 that if a line breaks, if you bleed off air really at any
20 point in the system, a spring, -- a loss of air to the
21 shutdown cylinder causes a spring to cause the fuel racks
22 to go to minimum fuel and shut the engine down. This one
23 requires that you actually send air to the shutdown
24 cylinder. So this logic has to function to make the engine
25 shut down.

1 Q So under my hypothetical, you're saying that
2 the logic system just wouldn't work?

3 A (Witness Johnston) I believe so. If we're
4 talking about that much water getting in there, I believe
5 you're just going to lock up the whole logic system, or
6 you're going to turn it from a pneumatic system to a
7 hydraulic system and with the size of the lines and the
8 lengths of them, you're going to have such a slow reaction
9 time, instead of a 70 second shutdown, it might have been a
10 70 day shutdown.

11 BY CHAIRMAN BLOCH:

12 Q Well, that's the upper bound. Is there
13 someplace in between where you could fail tripped instead
14 of failing running?

15 A (Witness Owyong) I don't know how to put a
16 limit on it.

17 A (Witness Johnston) I think then you have to
18 start attacking individual logic elements saying if you can
19 cause this element or this element to malfunction -- when I
20 say this or that, I'm talking in the hypothetical, you know
21 -- identify a specific element and then say if this one
22 malfunctions will it shut it down. We'd have to treat it
23 on that basis.

24 Q So has an analysis been done that would allow
25 us to know whether or not moisture could cause a prolonged

1 trip of the diesel?

2 A (Witness Owyong) No, an analysis has not been
3 done.

4 BY ADMINISTRATIVE JUDGE MURPHY:

5 Q Well, if you filled up the filter bowl with
6 water, would that affect the air pressure downstream on the
7 60 pound side?

8 A (Witness Owyong) I would say that it would
9 have a tendency of depressurizing the system.

10 Q And then what does that do?

11 A (Witness Owyong) Allows the engine to
12 continue to run because you can't shut the engine down
13 because you need pressure to shut the engine down.

14 CROSS EXAMINATION (Continued)

15 BY MR. MICHAEL KOHN:

16 Q But the reduced pressure could also initiate a
17 trip signal, can't it?

18 A (Witness Johnston) At certain portions in the
19 logic. I mean if you bring the whole logic system down
20 together is quite different in the way the logic is going
21 to respond versus bringing down certain lines and leaving
22 other portions of the system pressurized.

23 Q So if a slug of water went through, could you
24 predict what would happen?

25 A (Witness Johnston) The prediction of a slug of

1 water going through, as we stated previously, it's going to
2 slow the timing of the Group 2 lockout.

3 CHAIRMAN BLOCH: I'm not sure there's anything
4 more you can get out of this.

5 (Pause.)

6 CHAIRMAN BLOCH: Do you need a recess? We'll
7 take a five minute recess so you can talk about it. But
8 the witnesses have been quite forthcoming and they've
9 addressed a wide variety of hypotheticals. I'm not sure
10 you haven't exhausted it at this point.

11 MR. MICHAEL KOHN: I wouldn't know, Your Honor,
12 until I talk to my expert.

13 CHAIRMAN BLOCH: We'll take a five minute
14 recess for you to do that.

15

16 MR. MICHAEL KOHN: Thank you.

17 CHAIRMAN BLOCH: We'll make it a ten minute
18 recess and we won't have to have another one later.

19 (A short recess was taken.)

20 CHAIRMAN BLOCH: Back on the record.

21 BY MR. MICHAEL KOHN:

22 Q To clarify the last segment of your testimony,
23 if I understand it, if a slug came through after 60 seconds
24 and leakage in the trip line is occurring, it could trip
25 the diesel.

1 A (Witness Owyong) Yes, if it's greater than
2 20/1000ths.

3 Q And the orifices -- is it also true that
4 orifices are designed to pass air -- excuse me -- if what
5 is greater than 20/1000ths?

6 A (Witness Owyong) If the Group 2 -- or your
7 leak is greater than 20/1000ths.

8 Q I thought Group 2 was applied to a 6/1000ths.

9 A (Witness Owyong) No, after the 60 second
10 lockout period, the Group 1s and Group 2s are connected
11 together by the logic element 14.

12 Q And orifices are designed to pass air, the
13 passage of water would occur at a significantly reduced
14 rate, effectively blocking the passage of air, is that
15 correct?

16 A (Witness Johnston) Yes, that's correct.

17 Q Now earlier we were talking about your
18 testimony related to the Clark Air Force --

19 ADMINISTRATIVE JUDGE CARPENTER: Mr. Kohn,
20 before you leave this area, I'd like to ask the witnesses
21 whether they have ever made an analysis of the impact of
22 various quantities of water on the dynamics of the
23 pneumatic control system.

24 WITNESS OWYOUNG: No, I haven't.

25 WITNESS JOHNSTON: No.

1 ADMINISTRATIVE JUDGE CARPENTER: Starting with
2 a 10th of a milliliter, one milliliter, ten milliliters, et
3 cetera.

4 WITNESS JOHNSTON: No.

5 WITNESS OWYOUNG: No.

6 ADMINISTRATIVE JUDGE CARPENTER: Because I
7 think the questions relate to the dynamic response which
8 depends upon the input signal in terms of how much water.

9 WITNESS JOHNSTON: Yes.

10 ADMINISTRATIVE JUDGE CARPENTER: Have you ever
11 looked to see how much water could form by condensation in
12 the supply lines?

13 WITNESS OWYOUNG: No, we haven't.

14 ADMINISTRATIVE JUDGE CARPENTER: Is it fair for
15 the Board to have the impression that therefore your
16 testimony is off the top of your head?

17 WITNESS OWYOUNG: That is correct.

18 ADMINISTRATIVE JUDGE CARPENTER: Thank you for
19 clarifying.

20 CROSS EXAMINATION (Continued)

21 BY MR. MICHAEL KOHN:

22 Q Now previously we had some discussion about the
23 status of the diesels at the Clark Air Force Base in the
24 Philippines, and we ended that discussion when you
25 mentioned a spring could possibly be subjected -- a spring

1 within the logic element could corrode, correct?

2 A (Witness Owyong) That's correct.

3 Q Okay. But it is your experience that the logic
4 elements, including the spring, would have shut -- at the
5 Philippine base showed no sign of corrosion?

6 A (Witness Owyong) That's correct. That was
7 based on removing one of the logic boards and the engineer
8 on site was rebuilding the elements and I was there looking
9 at the particular elements.

10 Q So therefore, the spring would also, in your
11 opinion, be resistant to any form of corrosion?

12 A (Witness Owyong) I can't say that, no.

13 Q You didn't see any?

14 A (Witness Owyong) I didn't see any.

15 BOARD EXAMINATION

16 BY CHAIRMAN BLOCH:

17 Q May I ask how long you believe that spring was
18 exposed to moist air?

19 A (Witness Owyong) I would say that again, not
20 knowing the records at Clark Air Base --

21 Q Well, that was what I was concerned about.

22 A (Witness Owyong) Yeah, --

23 Q If we don't know how long it was exposed, I'm
24 not sure how relevant it is.

25 A (Witness Owyong) I know that the elements

1 were not rebuilt within a four year period.

2 Q And that's based on the records at the base?

3 A (Witness Owyong) That's based on the
4 operation of the plant and also the purchasing of
5 replacement parts through Cooper.

6 Q So you examined the purchase records?

7 A (Witness Owyong) No, I haven't, but when I
8 was there, they said this -- the engineer told me this is
9 the first time that they were rebuilding those parts, when
10 they took over the parts.

11 Q So it was based on a statement of the engineer.

12 A (Witness Owyong) That's correct.

13 Q And he'd been on duty from the time that that
14 element had been installed?

15 A (Witness Owyong) No, not the time the element
16 had been installed, the time that they took over the base.
17 The Philippine government took over the base.

18 Q And he'd been there for four years?

19 A (Witness Owyong) That's my understanding,
20 yes. I don't know that for a fact.

21 A (Witness Johnston) If I may add something
22 relative to Clark. While the air dryers were inoperative
23 in the system, the control panels are still -- excuse me --
24 the control panels are still fitted with the filter
25 regulator of the same type that we have here in the Vogtle

1 panel and that knocks out moisture from the air supplied to
2 the panel in the same manner as we've discussed, you have a
3 bowl on it, I don't know -- they're the exact same filters,
4 aren't they?

5 A (Witness Owyong) For the nuclear units,
6 they're the exact same filters. For the commercial units
7 that are there, we supply a filter regulator as a combined
8 unit, but it's the same type of element.

9 A (Witness Johnston) So there's no dryer, but
10 there are still really two points at which moisture is
11 knocked out before the air gets to the logic. The first is
12 the collection of moisture in the bottom of the air
13 receiver, which would be drained by operations personnel at
14 some periodic interval. The second would be the filter
15 regulator within the control panel.

16 BOARD EXAMINATION

17 BY CHAIRMAN BLOCH:

18 Q Well, would you know whether or not with that
19 set up and without a dryer, moisture has gotten to the
20 logic system at any point in the operation of that diesel?

21 A (Witness Owyong) I would say during my
22 testing and also looking at the logic board, the one logic
23 board that was dismantled, I would say no, moisture did not
24 get to the system.

25 Q And the parts you looked at, were they

1 corrosion resistant?

2 A (Witness Owyong) No, they're the same
3 elements that are used at Vogtle.

4 Q So if they had been exposed to moisture with
5 the filter regulator being the only source of keeping
6 moisture out, you think you would have seen that, seen
7 evidence of that.

8 A (Witness Owyong) Yes. And that's based on
9 experience of seeing corroded springs on marine
10 applications.

11 Q And did the marine applications have the same
12 filter regulator?

13 A (Witness Owyong) No.

14 Q One more question. At Clark, do they check the
15 filter with some regularity?

16 A (Witness Owyong) I would say that staff that
17 is there no, I would say no.

18 Q They don't check it?

19 A (Witness Owyong) No.

20 Q Have they ever found moisture in it?

21 A (Witness Owyong) That I don't know.

22 CROSS EXAMINATION (Continued)

23 BY MR. MICHAEL KOHN:

24 Q The spring element or the spring in the logic
25 elements on the marine diesels, they -- if I understand it,

1 they don't experience corrosive effects of the springs for
2 12 to 13 years?

3 A (Witness Owyong) No, I said that they have
4 been in operation during that period of time. I don't know
5 if they have changed them out, I don't know their records.

6 Q Well in your testimony, you say "I have seen
7 some degradation of the springs in the logic elements after
8 12 or 13 years of service."

9 ADMINISTRATIVE JUDGE CARPENTER: Could you give
10 me a page reference please?

11 MR. MICHAEL KOHN: Yes, page 3, lines 15 and
12 16.

13 A (Witness Owyong) Page what again?

14 Q Page 3, lines 15 and 16.

15 A (Witness Johnston) Inspection of those
16 elements after 12 to 13 years showed that springs were
17 rusted. When that rusting began is some time prior to the
18 date of the inspection.

19 Q Well, Mr. Owyong, your testimony is "I have
20 seen some degradation of the spring after 12 or 13 year of
21 service, is that correct?

22 A (Witness Owyong) That's correct.

23 Q So your testimony, as I read it and how it is
24 stated, indicates that the degradation is occurring after
25 the 13 --

1 CHAIRMAN BLOCH: No, Mr. Kohn, he clarified
2 that and the clarification is perfectly understandable. He
3 saw it after 12 years, he has no idea how long before that
4 it started.

5 BY MR. MICHAEL KOHN:

6 Q So then you have no basis to suspect that the
7 spring is -- would corrode after --

8 CHAIRMAN BLOCH: It's asked and answered, the
9 record is very clear on the fact that he doesn't know when
10 it started.

11 BY MR. MICHAEL KOHN:

12 Q And therefore, the absence of corrosion within
13 the logic element would not indicate whether or not water
14 or extremely humid air had passed through that particular
15 logic element, is that correct?

16 A (Witness Owyong) Say that again please.

17 Q The absence of corrosion within --

18 CHAIRMAN BLOCH: I think I can ask the question
19 for you. Since you don't know how long it takes after the
20 spring is exposed to moist air before it would start
21 corroding, I take it then that you can't infer anything
22 about whether there's moist air present when you observe a
23 spring that's not corroded.

24 WITNESS OWYOUNG: That's correct.

25 BY MR. MICHAEL KOHN:

1 Q And in fact, the inspection of a logic element
2 would in no way indicate whether or not it was subjected to
3 water or extremely humid air --

4 CHAIRMAN BLOCH: That's what he just said.

5 MR. MICHAEL KOHN: He said it with respect to
6 the spring, I wanted to make sure it was with respect to
7 the entire element.

8 A (Witness Owyong) That's correct.

9 BOARD EXAMINATION

10 BY ADMINISTRATIVE JUDGE CARPENTER:

11 Q Do the witnesses consider themselves to be
12 expert in corrosion?

13 A (Witness Owyong) No.

14 A (Witness Johnston) No, sir.

15 Q Thank you.

16 A (Witness Johnston) Though after driving a
17 Chrysler in Kansas City in the winters, I got quite
18 familiar with it.

19 Q Well more to the point, are you aware of any
20 case where a pneumatic protection system has failed because
21 of failure of springs because of corrosion?

22 A (Witness Owyong) I'm not aware.

23 A (Witness Johnston) Neither am I.

24 BY CHAIRMAN BLOCH:

25 Q Well, how good is the reporting system, why

1 would you become aware?

2 A (Witness Owyong) We wouldn't, unless a
3 customer asked us for help, they couldn't figure out what
4 caused their shutdown or --

5 Q So if they had a failure, they just figured
6 these things shut down every once in awhile and they fixed
7 it themselves, you just wouldn't know.

8 A (Witness Owyong) Exactly.

9 CROSS EXAMINATION (Continued)

10 BY MR. MICHAEL KOHN:

11 Q Were you involved with the taking or evaluation
12 of dew point measurements obtained at Plant Vogtle after
13 the site area emergency?

14 A (Witness Owyong) No.

15 A (Witness Johnston) No.

16 Q Have you ever been involved with the taking of
17 dew point measurements or analyzing dew point measurements
18 at Plant Vogtle?

19 A (Witness Owyong) No.

20 A (Witness Johnston) No.

21 Q Were you aware of whether or not high dew point
22 readings were obtained at Plant Vogtle following the site
23 area emergency?

24 CHAIRMAN BLOCH: They never analyzed the dew
25 points, you just established that.

1 WITNESS JOHNSTON: I will say that we have been
2 prevented from performing functions by the system engineer
3 until he was satisfied with dew point on several occasions
4 during outage work.

5 BOARD EXAMINATION

6 BY CHAIRMAN BLOCH:

7 Q Could you tell us about the times when he was
8 not satisfied with dew point, how often did that happen?

9 A (Witness Johnston) The most recent I recall I
10 believe was in March of this year, where generally after --
11 generally during the outage work, the switch gear may be
12 taken out of service or the compressors are powered down
13 due to scheduled maintenance of these components, and when
14 these systems are brought back up, it typically requires a
15 minimum of 48 -- excuse me -- 24 hours of dryer operation
16 before we expect to see the dew points within
17 specification. Sometimes it takes longer than that period
18 of time and I think in March of this year it did before the
19 system engineer said okay, you can proceed with
20 pressurizing up the system and getting ready to start.

21 CROSS EXAMINATION (Continued)

22 BY MR. MICHAEL KOHN:

23 Q Were you aware of any concerns of that nature
24 raised in the 1990 outage?

25 A (Witness Johnston) I don't recall.

1 A (Witness Owyong) I don't remember.

2 Q And asked another way, if it had occurred in
3 the 1990 outage, do you believe you would have recollection
4 of it?

5 A (Witness Owyong) No.

6 A (Witness Johnston) No.

7 Q Did you have any discussion with the IIT team
8 about air quality?

9 A (Witness Owyong) I could have, I don't
10 remember.

11 A (Witness Johnston) I don't recall.

12 Q Were you ever -- were you asked to evaluate
13 scenarios whereby water could have tripped the diesel on
14 March 20?

15 A (Witness Johnston) Prior to these hearings,
16 no.

17 A (Witness Owyong) I would say no.

18 Q And therefore, depending on the amount of water
19 in the diesel pneumatic system, an analysis following the
20 site area emergency could have resulted in a conclusion --

21 CHAIRMAN BLOCH: Asked and answered.

22 Q Mr. Johnston, at Plant Vogtle, is there a -- do
23 either of you gentlemen know what the minimum design
24 temperature of the diesel room is?

25 A (Witness Owyong) I don't.

1 Q At Plant Vogtle.

2 A (Witness Owyong) Yes, I don't. Do you
3 remember, Bob?

4 A (Witness Johnston) I vaguely seem to remember
5 seeing that in one of the documents that I reviewed prior
6 to coming here, but I don't recall what the number is.
7 It's either 50 or 60 degrees, but I don't recall exactly.

8 Q But you didn't know that in 1990?

9 A (Witness Johnston) No, I did not.

10 Q Do either of you consider yourselves expert in
11 two-phase flow?

12 A (Witness Johnston) No.

13 A (Witness Owyong) No.

14 Q The thrust of your prefiled testimony at page
15 7, lines 3 through 7, is that by and large, you would not
16 expect to see corrosion on a Calcon sensor where that
17 sensor was exposed to water or moisture, is that correct?

18 A (Witness Johnston) Could you repeat that
19 question, please?

20 CHAIRMAN BLOCH: For us too, you said page 20
21 of the testimony?

22 MR. MICHAEL KOHN: Page 7, lines 3 through 7.

23 CHAIRMAN BLOCH: Thank you.

24 BY MR. MICHAEL KOHN:

25 Q That portion of your testimony by and large

1 indicates that you would not expect to see corrosion on a
2 Calcon sensor where that sensor was exposed to water or
3 moisture.

4 A (Witness Owyong) No, I was saying that I
5 haven't seen any corrosion.

6 Q Can unsatisfactory air quality have, in your
7 opinion -- let me rephrase it -- what is the effect of
8 unsatisfactory air quality on these Calcon sensors, if they
9 were continuously exposed to unsatisfactory air quality?

10 CHAIRMAN BLOCH: I think you'd better define
11 what you mean by unsatisfactory, counselor.

12 BY MR. MICHAEL KOHN:

13 Q Are you aware of Vogtle's requirements --

14 BOARD EXAMINATION

15 BY CHAIRMAN BLOCH:

16 Q Okay, if this air -- if there were air with dew
17 points above 50 degrees regularly being used in the control
18 air system, do you know what effect that would have on the
19 Calcon sensors?

20 A (Witness Johnston) I believe the only way that
21 we can answer that -- or I should say the only way that I
22 could answer that is knowing of installations where control
23 systems have functioned properly without means for drying
24 the air after it has been compressed to the receivers and
25 knowing that they are environments which experience high

1 humidity levels, we have not seen failures of the
2 components, such as Clark Air Base, numerous installations
3 at municipalities throughout this country.

4 Q Okay, and do you know how long such a sensor
5 could be exposed to air with above 50 degree dew points
6 without seeing any signs of corrosion?

7 A (Witness Johnston) I cannot provide you with a
8 specific answer to that.

9 A (Witness Owyong) I don't know.

10 A (Witness Johnston) Do not have direct
11 knowledge.

12 CROSS EXAMINATION (Continued)

13 BY MR. MICHAEL KOHN:

14 Q So other than taking dew point measurements, is
15 there any other method you know of to ensure that the
16 moisture content within the air system does not exceed 50
17 degrees Fahrenheit?

18 A (Witness Johnston) No.

19 A (Witness Owyong) No.

20 Q And you could not assure yourself of the dew
21 point of the air by looking at the Calcon sensors?

22 A (Witness Johnston) No, that's not a -- that is
23 not a means of measuring dew point.

24 Q Now -- or of inferring that air quality was
25 satisfactory?

1 A (Witness Johnston) If the Calcon sensor does
2 not show degradation then the air quality was satisfactory
3 for that sensor.

4 Q Satisfactory? I'm sorry, I didn't -- define
5 the term.

6 CHAIRMAN BLOCH: Mr. Kohn, I think that whether
7 it's satisfactory depends on the undertakings the Licensee
8 has made and whether or not they're binding, which is a
9 question that the staff has been suggesting they may raise.
10 Mr. Kohn, could you tell me roughly where you are in the
11 cross plan?

12 MR. MICHAEL KOHN: Yes, we're on Number 6. And
13 as soon as...

14 MR. BLAKE: I'm hopeful I'll watch you flip a
15 lot of pages, Judge Bloch.

16 CHAIRMAN BLOCH: I did; unfortunately there's a
17 lot of other pages left.

18 MR. BLAKE: Oh.

19 BY MR. MICHAEL KOHN:

20 Q In your prefiled testimony there's reference to
21 Pages 15 and 16 of Mr. Mosbaugh's testimony.

22 A (Witness Johnston) Where is that?

23 Q That's what I'm looking for. I forgot to write
24 down the page cite.

25 A (Witness Johnston) Page 8, Line 4.

1 Q Thank you, sir.

2 And...

3 CHAIRMAN BLOCH: It may also be following that
4 on Page 9.

5 MR. MICHAEL KOHN: I'm going to ask...

6 BY MR. MICHAEL KOHN:

7 Q Mr. Owyong, you provided the response to this
8 portion of the testimony, correct?

9 A (Witness Owyong) That's correct.

10 Q Okay. Mr. Johnston, did you review Pages 15
11 and 16 of the testimony?

12 A (Witness Johnston) Yes, I have. I don't
13 recall the contents of them right now.

14 Q Okay. Now, Mr. Owyong, does Mr. Mosbaugh's
15 testimony actually state that the .006 orifices or... Let
16 me point you to Lines 10 and -- 10 through 13 of your
17 prefiled testimony, on Page 8, where you state that
18 Mr. Mosbaugh mentions that there are .006 inch orifices in
19 a pneumatic circuit, implying that such small orifices, if
20 blocked, could have caused the March 20, 1990, 1-A diesel
21 failure. Do you see that?

22 A (Witness Owyong) Yes, I do.

23 Q Is -- did Mr. Mosbaugh's testimony on Pages 15
24 and 16 actually imply that?

25 MR. BLAKE: Can we provide the witnesses with a

1 copy of Mr. Mosbaugh's testimony, please.

2 WITNESS OWYOUNG: I think I remember that
3 section.

4 BY WITNESS OWYOUNG:

5 A Basically stated small orifices, but then in
6 the next line he's -- the orifices as small as six -- six-
7 thousandths.

8 Q But it doesn't say anything about implying that
9 that orifice, if blocked,...

10 A (Witness Johnston) Well, it doesn't state
11 "implying," but it certainly -- it's the way I read it, as
12 well.

13 Q Isn't that portion of the testimony a
14 description of the physical layout, in lay person's terms?

15 A (Witness Johnston) It's a generalization of
16 components that can be found within the control panel.

17 Q And does a lay person description of the layout
18 imply anything about what would happen if an orifice is
19 blocked...

20 MR. BLAKE: Objection.

21 Q ...during the site area emergency?

22 MR. BLAKE: I don't know what a lay person's
23 description does, "X" or "Y," but is it really helpful or
24 probative at this juncture?

25 CHAIRMAN BLOCH: I don't consider these people

1 experts...

2 MR. BLAKE: It's argumentative.

3 CHAIRMAN BLOCH: ...in interpreting what
4 Mr. Mosbaugh meant. Now, if you want to clarify what they
5 mean, that would be fine.

6 WITNESS JOHNSTON: Is there a question
7 remaining?

8 MR. MICHAEL KOHN: No.

9 CHAIRMAN BLOCH: No.

10 BY MR. MICHAEL KOHN:

11 Q And at this portion of your testimony you go
12 over Group 2 lockout timers and analyze .006 orifices, is
13 that correct?

14 A (Witness Owyong) That's correct.

15 Q But you did not explain what the effects of the
16 other orifices would have been in this portion of your
17 testimony, did you?

18 A (Witness Owyong) That's correct.

19 CHAIRMAN BLOCH: Mr. Kohn, you have testimony
20 on the record about the extent to which they've analyzed
21 the effect of moisture on this system. I'm not sure why
22 you're going into this at this point. I can understand why
23 it was in the plan, but I think it's been answered by prior
24 questions.

25 BY MR. MICHAEL KOHN:

1 Q Are you familiar with the ANSI standards? Let
2 me...

3 CHAIRMAN BLOCH: This isn't the same area we
4 went into before, is it, Mr. Kohn?

5 MR. MICHAEL KOHN: Well, hopefully I've -- I've
6 repeated it in my cross plan and that would be great, we
7 could cut through this quick.

8 ADMINISTRATIVE JUDGE CARPENTER: You got it.

9 MR. MICHAEL KOHN: Okay.

10 BY MR. MICHAEL KOHN:

11 Q Mr. Owyong, on Page 9, Lines 1 through 9 of
12 your prefiled testimony, you state that ANSI Standard S-7.3
13 does not state the type of component or system it should
14 cover, and that it is up to the end user to decide.

15 A (Witness Owyong) That's correct.

16 Q Does -- I'm going to ask you to look at
17 Intervenor's Exhibit Number 11.

18 (The witness reviews certain material.)

19 Q Does S-7.3 state anywhere that it is left up to
20 the end user to decide whether to adopt this standard?

21 A (Witness Owyong) What section?

22 CHAIRMAN BLOCH: Could you point the witness to
23 some -- is there someplace that it says that it's not up to
24 the end user?

25 MR. MICHAEL KOHN: No, I'm asking -- it does

1 not address that. My...

2 BY MR. MICHAEL KOHN:

3 Q Would you turn to Page 3, Item Number 4 of
4 Exhibit 11, and you see reference to...

5 WITNESS JOHNSTON: I'm sorry, this copy doesn't
6 have that page.

7 CHAIRMAN BLOCH: Neither does mine.

8 WITNESS JOHNSTON: Oh, okay. Okay.

9 WITNESS OWYOUNG: Page 3 of 4, is that what
10 we're referring to?

11 WITNESS JOHNSTON: I was referring to the page
12 number down here.

13 CHAIRMAN BLOCH: Page 3 of 4 which has 5 at the
14 bottom, is that it?

15 WITNESS JOHNSTON: Yes.

16 CHAIRMAN BLOCH: Okay.

17 MR. MICHAEL KOHN: I don't have an exhibit...

18 BY MR. MICHAEL KOHN:

19 Q And if you would look at Item Number 4, does
20 that state that use in pneumatic instruments -- if you look
21 at the -- says, "This standard establishes four elements
22 for the quality of instrument air for use in pneumatic
23 instruments," is that correct?

24 A (Witness Owyong) That's correct.

25 Q And does that indicate to you that this

1 standard applies to...

2 CHAIRMAN BLOCH: To control air?

3 Q ...to control air?

4 A (Witness Owyong) Yes.

5 A (Witness Johnston) Used for -- used as

6 instrument air for pneumatic instruments.

7 Q And the Vogtle diesel uses pneumatic controls,

8 correct?

9 A (Witness Owyong) That's correct.

10 Q So the devices in the pneumatic control systems

11 are pneumatic instruments, correct?

12 A (Witness Owyong) That's correct.

13 Q Now, the logic elements within the diesel

14 system, would they be classified as pneumatic instruments

15 or fluidics devices?

16 A (Witness Owyong) Be classified as pneumatic

17 devices.

18 Q How about fluidics devices?

19 A (Witness Johnston) Air is a fluid; yes, they

20 can be fluidics devices.

21 A (Witness Owyong) Yes. Yeah.

22 Q Do you know what a fluidics device is as a term

23 of art?

24 A (Witness Johnston) Air is a fluid, these are

25 pneumatic devices; pneumatic is air, they are fluid

1 devices. And they're always -- it's saying the same thing.

2 A (Witness Owyong) Yeah.

3 Q So you don't recognize "fluidics devices" as a
4 special term?

5 A (Witness Owyong) I don't.

6 Q Okay. And if you'd look at the bottom of
7 Page 3 of Standard S-7.3, there is a note which -- with
8 reference to fluidics. Do you see that?

9 CHAIRMAN BLOCH: I don't. Could you say the
10 page again.

11 MR. MICHAEL KOHN: Yes, the bottom of -- the
12 same page, the last note on the very bottom. Says, "All
13 pneumatic devices may not require this quality of air,
14 while others," paren, "(fluidics)," close paren, "may
15 require a higher quality of air. Revision..."

16 BY MR. MICHAEL KOHN:

17 Q Do you see that?

18 A (Witness Owyong) Yes. Yes.

19 Q Therefore, with respect to fluidics devices,
20 even more stringent requirements than S-7.3 may apply?

21 A (Witness Owyong) That's correct.

22 A (Witness Johnston) May apply.

23 Q And so the minimum that you would apply to a
24 fluidics device would be S-7.3?

25 A (Witness Johnston) No.

1 A (Witness Owyoung) Not necessarily.

2 CHAIRMAN BLOCH: Okay, could you explain?

3 WITNESS OWYOUNG: Again, it's up to the...

4 MR. BLAKE: You want the question explained or
5 the answer?

6 CHAIRMAN BLOCH: The answer. That may explain
7 the question, too, but...

8 WITNESS OWYOUNG: Again, this is a standard for
9 air quality, and again, it's up to the end user, whoever it
10 may be, either -- either Cooper, being the company required
11 to supply the component, or -- or the actual person that is
12 -- that is receiving the component, to adopt this standard.

13 CHAIRMAN BLOCH: Thank you.

14 BY MR. MICHAEL KOHN:

15 Q And in the nuclear setting do you think that
16 the standards adopt...

17 CHAIRMAN BLOCH: Now we're back to what we did
18 this morning.

19 MR. MICHAEL KOHN: Okay.

20 BY MR. MICHAEL KOHN:

21 Q On Page 9, starting at Line 23,...

22 ADMINISTRATIVE JUDGE MURPHY: Page 9 of what?

23 MR. MICHAEL KOHN: The prefilled testimony.

24 BY MR. MICHAEL KOHN:

25 Q You discuss how air dryers are not essential

1 for the reliable diesel operation in nuclear application,
2 is that correct?

3 A (Witness Owyong) That's correct.

4 Q Do you know what the NRC's branch technical
5 position is on the diesel reliability in the NRC Standard
6 Review Plan?

7 A (Witness Owyong) No, I don't.

8 Q Do you think that in order for your opinion
9 about whether the air dryers are essential for reliable
10 diesel operation, you would have to consider the NRC's
11 branch technical position from the standard review plan?

12 A (Witness Owyong) I based my opinion on our
13 dedication program that we had -- that we have at Cooper,
14 and that we had dedicated air dryers, and we have deemed
15 them non-safety related.

16 Q Have deemed them what?

17 A (Witness Owyong) Non-safety related.

18 CHAIRMAN BLOCH: I'm sorry, Cooper sets
19 standards for nuclear plants?

20 WITNESS OWYONG: No, we have a program -- no.
21 I'm not saying that we're setting standards for the plant.
22 What we do is that we evaluate the component and determine
23 if the component does affect the engine and its operation
24 of that engine.

25 CHAIRMAN BLOCH: Thank you.

1 MR. BLAKE: Judge Bloch, I don't know what the
2 reference was here to, whether it was to the Cooper Nuclear
3 Plant or to -- or to the company Cooper.

4 CHAIRMAN BLOCH: Well -- oh, I see, we meant
5 the company Cooper, didn't we?

6 MR. BLAKE: I don't know.

7 WITNESS OWYOUNG: Yes. Yes, the company
8 Cooper.

9 MR. BLAKE: Thank you.

10 BY MR. MICHAEL KOHN:

11 Q We have previously determined that blockage
12 of...

13 CHAIRMAN BLOCH: The question was discontinued.

14 WITNESS JOHNSTON: Yeah.

15 WITNESS OWYOUNG: Yes.

16 BY MR. MICHAEL KOHN:

17 Q If I understand it, it's your -- Cooper
18 recommends that the moisture content be maintained such
19 that no water is accumulated in the control panel filter
20 bowl?

21 A (Witness Owyong) That's correct.

22 Q And is there a exact (sic) dew point
23 measurement that you know when water would begin
24 accumulating in the control panel filter bowl?

25 A (Witness Owyong) No.

1 Q Is a centered bronze filter that is used in the
2 Plant Vogtle diesels designed to remove liquids from the
3 system?

4 A (Witness Owyong) No.

5 Q So what does remove the liquid from the system?

6 A (Witness Owyong) The design of the filter,
7 itself.

8 A (Witness Johnston) The filter being the
9 assembly of which the porous bronze element is a portion of
10 it.

11 Q Okay. So then -- so then stating what the
12 condition of the filter is would provide no meaningful
13 basis; you would have to state what the condition of the
14 bowl was, correct?

15 A (Witness Owyong) That's correct.

16 Q And if the bowl is periodically drained --
17 excuse me, if the bowl is not periodically drained, would
18 that remove the water from the system?

19 A (Witness Owyong) Say that again.

20 Q If the bowl is not periodically drained, would
21 the water remain in the system?

22 A (Witness Owyong) I would say yes, but it
23 could evaporate.

24 A (Witness Johnston) When you say "would the
25 water remain in the system," can you be more specific about

1 what you're asking, please?

2 Q Could it accumulate in -- at the point of the
3 filter and go further downstream?

4 A (Witness Johnston) I'm sorry, I still don't
5 understand.

6 MR. BLAKE: Can we have a -- we have already in
7 the record a diagram of this filter. Can you just focus on
8 it and -- and try to formulate your questions based on --
9 on that? Do you understand the configuration, Mr. Kohn?
10 'Cause it's difficult for me also to follow. I've been
11 trying to keep quiet, but this is not a filter that just
12 sits in the middle of a line, you know. We have a
13 structure, we know what this conical filter is, we know
14 where the bowl is.

15 BOARD EXAMINATION

16 BY CHAIRMAN BLOCH:

17 Q Well, let me ask, is there -- is there a
18 pathway by which water left in the bowl could wind up in
19 the system downstream of the filter element?

20 A (Witness Johnston) When water fills that bowl,
21 when it no longer has the capacity to hold water, then it
22 would no longer be able to knock water out of the air
23 passing through it.

24 Q And at that point would the moisture from the
25 filter bowl begin going downstream?

1 A (Witness Owyong) Yes.

2 CROSS EXAMINATION (Continued)

3 BY MR. MICHAEL KOHN:

4 Q And could moist air pass through that system
5 without being trapped in the bowl?

6 A (Witness Owyong) Based on the design of the
7 unit, the design is to take out the moisture from the air.

8 ADMINISTRATIVE JUDGE CARPENTER: I'd ask both
9 the questioner and the respondents to define what they mean
10 by "moist air," so the record will be intelligible.

11 BY MR. MICHAEL KOHN:

12 Q What did you mean in your response by "moist
13 air"?

14 A (Witness Owyong) I'm responding to your
15 statement of "moist air," the water with some moisture in
16 it.

17 Q Air with...?

18 A (Witness Owyong) I mean, excuse me, air with
19 some moisture in it.

20 A (Witness Johnston) That filter is not going to
21 be 100% effective in knocking out every trace of moisture.

22 Q When you say "moisture," are you meaning
23 physical water passing through it? Let's back up.

24 There's two ways moisture can pass through the
25 filter. One is in a condensed water form, and the other

1 would be as humid air.

2 A (Witness Johnston) Yes.

3 A (Witness Johnston) Uh-huh (affirmative).

4 Q All right. Is the filter designed to in any
5 way deal with the humid air?

6 A (Witness Owyong) Yes.

7 Q And can you explain how that is?

8 A (Witness Owyong) Well, when the air enters
9 the filter it creates a cyclonic effect to that air and it
10 spins out the water of that air and -- and has it drip down
11 the side of the bowl to a quiet area.

12 BOARD EXAMINATION

13 BY CHAIRMAN BLOCH:

14 Q Do you know the efficiency of that process,
15 what portion of...?

16 A (Witness Owyong) No, I don't.

17 BY MR. MICHAEL KOHN:

18 Q Are you referring to air that is not saturated,
19 that is going through the cyclonic process?

20 A (Witness Johnston) Yes.

21 A (Witness Owyong) Yes.

22 Q So it's your testimony that air at less than
23 100 percent -- excuse me, let me rephrase it -- that water
24 can be removed from air less than 100 percent saturated, by
25 the cyclonic process.

1 A (Witness Owyong) Not 100 percent of the
2 water, but a good portion of it, yes.

3 CHAIRMAN BLOCH: The testimony is clear, it did
4 not depend on there being 100 percent saturation -- the
5 testimony is clear.

6 BOARD EXAMINATION

7 BY ADMINISTRATIVE JUDGE CARPENTER:

8 Q Have you ever thought of patenting that idea
9 that these filters would be an adequate substitute for a
10 dryer?

11 A (Witness Johnston) No.

12 Q Do you pause and think about what you're
13 testifying? You're going to take water molecules out of a
14 stream of air with this cyclone?

15 A (Witness Johnston) Again, we're not saying
16 that this thing is 100 percent efficient in removing all
17 the water vapor. From our experience, used in control
18 system applications, this filter is effective in reducing
19 water vapor from air.

20 BY CHAIRMAN BLOCH:

21 Q Okay, but I asked you about what efficiency and
22 you wouldn't give me an efficiency.

23 A (Witness Johnston) Don't know the efficiency.

24 A (Witness Owyong) We don't know. That's
25 basically the design of the filter itself.

1 Q Could it be as low as ten percent efficient?

2 A (Witness Owyong) I can't put a value on it,
3 because I just don't know.

4 Q Could it be as low as two percent?

5 A (Witness Johnston) Don't know. But we know
6 that moisture in compressed air sent through this filter
7 leaves water in the filter bowl. What percentage of that
8 moisture is removed as water in the filter bowl, we don't
9 know, but it leaves water in the filter bowl. And we know
10 that it has been sufficient in removing water for our non-
11 nuclear municipalities, ships, whatever. I believe that
12 Sheldon said earlier it was not on board the ship he looked
13 at, but we know in most of the municipalities where these
14 are installed, it has been satisfactory for long term
15 operation of the control systems.

16 CROSS EXAMINATION (Continued)

17 BY MR. MICHAEL KOHN:

18 Q Now in the process of compressing air, you can
19 create physical water correct?

20 A (Witness Johnston) That's correct.

21 Q So have you really analyzed whether the water
22 that's going into that bowl is from the process of physical
23 water being formed in the compression process that the bowl
24 is trapping or what percentage of it is actually coming
25 from humidity?

1 A (Witness Johnston) Again, the receivers are
2 designed for low point drains. I hope that we don't have
3 any applications out there where the feed going to the
4 control panel is taken at a point that is going to be
5 immersed in water standing in the bottom of the receiver.

6 Q If I understand your testimony on page 3, line
7 12, within the continental United States, only at Plant
8 Vogtle have you seen degradation of the control system as a
9 result of water or moisture.

10 A (Witness Owyong) That's correct.

11 Q Are you also aware of whether a logic board was
12 determined to be failing at Plant Vogtle following the site
13 area emergency?

14 A (Witness Owyong) Yes.

15 A (Witness Johnston) No.

16 A (Witness Owyong) Or not operating properly.

17 A (Witness Johnston) We never determined that
18 that logic board failed. Again, referring to the
19 inspection report which I wrote for Ken Burr and we
20 discussed yesterday, I think yesterday, we were talking
21 about a lube oil pressure sensor -- that same report
22 addressed that logic board. That logic board on the test
23 stand failed to produce any defects. We believe that the
24 integration of the entire system and the speed at which
25 things could vent, could cause that logic board to lock up

1 and fail to provide a shutdown cylinder.

2 Q At the time the logic board was removed from
3 the diesel at Plant Vogtle, it was presumed to not be
4 functioning, correct?

5 A (Witness Johnston) It was presumed to be not
6 functioning.

7 Q And then when you took that logic board and
8 tried to find what was wrong with it, you couldn't find
9 anything wrong with it?

10 A (Witness Johnston) It functioned exactly as it
11 was designed to.

12 BOARD EXAMINATION

13 BY CHAIRMAN BLOCH:

14 Q Gentlemen, if there were problems in marine
15 applications that resulted in problems of the amount of
16 time to start the diesel, would you know about that?

17 A (Witness Johnston) Most likely, yes.

18 Q Why is that?

19 A (Witness Johnston) There are very specific
20 requirements by ABS in specifically crash maneuvering,
21 where the vessel is going forward at maximum speed and they
22 receive a stop signal, an emergency stop signal, and they
23 have to bring that vessel to a stop, which requires that
24 the engines -- I'm trying to keep this from getting too
25 lengthy, but most of our marine applications have direct

1 reversing engines -- for them to reverse and cause reverse
2 propulsion of the ship, the engine has to come to a stop,
3 shift camshafts and restart in the astern direction, to
4 perform this crash astern maneuver. If it fails to perform
5 that, we are notified.

6 Q And what's the spec on how much time they have
7 to take in restart?

8 A (Witness Johnston) I don't recall what ABS
9 has, I think it's actually expressed in a distance as
10 opposed to a time, but if the ship is moving forward at 18
11 knots, then they have a certain distance in which that ship
12 has to come dead in the water.

13 Q Is there a relationship between that
14 requirement and the assurance that a diesel might start
15 within 11 seconds?

16 A (Witness Johnston) No.

17 A (Witness Owyong) No, I wouldn't now.

18 BY ADMINISTRATIVE JUDGE MURPHY:

19 Q What does the acronym ABS stand for?

20 A (Witness Johnston) American Bureau of Shipmen.

21 CROSS EXAMINATION (Continued)

22 BY MR. MICHAEL KOHN:

23 Q In that case -- in those cases, the engine is
24 running and it was running, and is not -- and hasn't been
25 shut down for three or four weeks, correct?

1 A (Witness Owyong) No, not necessarily.

2 A (Witness Johnston) It's running at the time of
3 the crash astern.

4 Q Yes. And in the nuclear setting, the diesel
5 would not be running, it has to come up to speed, correct?

6 A (Witness Johnston) Yes.

7 Q So there's no correlation between how the
8 engine performs when it's running versus how it performs
9 when it's coming up to speed, is there?

10 A (Witness Johnston) No, I believe the question
11 I was responding to had to do with requirements of engine
12 performance aboard ships.

13 Q Right. And I'm saying that the engine
14 performance aboard ships is just the opposite of the engine
15 performance you would expect in the nuclear setting because
16 the ship is going from a running position --

17 BOARD EXAMINATION

18 BY CHAIRMAN BLOCH:

19 Q I don't know about this opposites business, but
20 what I'm hearing is that we don't necessarily know that
21 because you can perform the ship requirement, that you
22 could start from a cold condition under the requirements of
23 the Nuclear Regulatory Commission, is that correct?

24 A (Witness Johnston) Requirements of ship
25 propulsion operation are different than those of the

1 nuclear standby application. The only point that I was
2 trying to make is shipboard propulsion operation has very
3 critical requirements as well.

4 Q Is there any way that we can make a logical
5 deduction from the ship requirements to the NRC
6 requirements so that we can be assured that moist air will
7 not affect the ability of the diesels to start properly
8 under NRC requirements?

9 A (Witness Owyong) I would say no.

10 A (Witness Johnston) I don't know that we can
11 make a direct comparison of that.

12 CROSS EXAMINATION (Continued)

13 BY MR. MICHAEL KOHN:

14 Q Now did you observe trash or garbage or debris
15 in any of the logic elements at Plant Vogtle during March
16 of 1990?

17 A (Witness Johnston) On the B train diesel, if I
18 remember, we were troubleshooting a logic function that
19 caused us to disassemble an element and we found a small
20 piece of what we classified as debris.

21 A (Witness Owyong) That was an OR element.

22 A (Witness Johnston) On B train, wasn't it?

23 A (Witness Owyong) Yes.

24 Q And I guess it -- do you remember the diameter
25 of this piece of trash?

1 A (Witness Johnston) No, but it was certainly
2 larger than five micron.

3 Q And are you aware of any evaluation of how it
4 entered the system?

5 A (Witness Johnston) I don't recall.

6 A (Witness Owyong) I don't recall, no.

7 BOARD EXAMINATION

8 BY CHAIRMAN BLOCH:

9 Q Do you know whether or not any paper was
10 created at the time that you found that, so that there
11 would be an engineering analysis of how it got there?

12 A (Witness Owyong) My recollection is that we
13 noted it on the continuation sheet, but as far as --

14 Q It would be on an MWO?

15 A (Witness Owyong) Yes, it would be on -- I
16 think it would be in the functional test.

17 A (Witness Johnston) I believe so. I simply
18 don't recall, but I'm pretty certain that was documented.

19 CROSS EXAMINATION (Continued)

20 BY MR. MICHAEL KOHN:

21 Q And with respect to the comparison of -- it may
22 be unnecessary but --

23 CHAIRMAN BLOCH: That's a red flag, isn't it?
24 If you think it may be unnecessary, please don't ask it.

25 (Laughter.)

1 BY MR. MICHAEL KOHN:

2 Q Are you familiar with the air start
3 distributor?

4 A (Witness Johnston) Yes.

5 Q Would you describe what it is and how it works?

6 A (Witness Johnston) The air start distributor
7 is an assembly whose function is to pulse pressure to the
8 starting air valves in each of the cylinder heads in a
9 timed sequence during the start of the engine.

10 Q And where does the air start distributor get
11 its supply from?

12 A (Witness Johnston) From the starting air
13 receivers.

14 Q And is there a pressure reducer in the supply
15 line?

16 A (Witness Johnston) No.

17 Q What are the sizes of the lines?

18 A (Witness Johnston) To the best of my
19 recollection, the line feeding air to the distributor is
20 5/8 or 3/4. The lines feeding the individual starting air
21 valves from the distributor are quarter inch.

22 Q And how long are the quarter inch lines?

23 A (Witness Johnston) They vary in length.

24 Q What's the range?

25 A (Witness Johnston) The shortest lines would be

1 approximately six foot, the longest line on a 16 cylinder
2 engine would be approximately 24 feet.

3 Q And that is quarter inch O.D. tubing?

4 A (Witness Johnston) That's correct.

5 Q And what would be the internal diameter
6 measurement?

7 A (Witness Johnston) I don't recall
8 specifically, I believe that is 049 wall tubing.

9 A (Witness Owyong) I think so, I don't really
10 remember.

11 Q What would be the effect of restriction in the
12 air supply, either to the air start distributor or the
13 individual air start pilots?

14 CHAIRMAN BLOCH: Wait a second. You were just
15 giving the wall measurement.

16 WITNESS JOHNSTON: That's correct.

17 CHAIRMAN BLOCH: So we should subtract to get
18 the --

19 WITNESS JOHNSTON: You would take quarter inch
20 and subtract that, that would be a radial wall thickness,
21 you would have to subtract double that and figure out your
22 area.

23 BY MR. MICHAEL KOHN:

24 Q You have to subtract two times the wall.

25 A (Witness Johnston) That's correct, I said

1 that's a radial wall thickness.

2 Q And what would be the effect of a restriction
3 in the air supply either to the air start distributor or to
4 the individual air start pilots?

5 A (Witness Johnston) What type of restriction?

6 Q Restriction in pressurizing the pilot?

7 A (Witness Johnston) A blockage? And that's a
8 question.

9 Q Excuse me?

10 A (Witness Johnston) A blockage? And that's a
11 question.

12 Q Yes, blockage.

13 A (Witness Johnston) Blockage of the pilot line
14 going to the air start valve would cause the air start
15 valve to not receive a signal from the distributor.

16 Q And not admit air to the cylinder?

17 A (Witness Johnston) That's correct.

18 Q What is the length of the pulse that the air
19 distributor is seeing?

20 A (Witness Johnston) Again, I assume you're
21 asking for a period of time?

22 Q Yes.

23 A (Witness Johnston) That varies with engine
24 speed.

25 Q A range -- is there a range?

1 A (Witness Johnston) If the engine is not
2 rotating, that pulse will last for five seconds, based on
3 five seconds under a normal start, which is a function of
4 control logic. Under an emergency start, it would last
5 until receiver pressure decreases to 150 psi.

6 Q The pulses are occurring in a timed sequence,
7 correct?

8 A (Witness Johnston) That's correct.

9 Q What is the shortest interval in that timed
10 sequence for an individual pulse?

11 A (Witness Johnston) Okay. Understand that when
12 I say they are in a timed sequence, they are a function of
13 degrees of crankshaft rotation. That requires knowing the
14 speed of the engine to determine the length of the pulse.

15 MR. MICHAEL KOHN: Your Honor, I note the time
16 and it may be a logical place for our lunch break.

17 ADMINISTRATIVE JUDGE MURPHY: Can you get the
18 next one done in two minutes?

19 CHAIRMAN BLOCH: I think we could take the
20 lunch break now. I'd like to point out that by my
21 calculation, we're about 75 percent through with the cross
22 plan. Can we get the next one done?

23 MR. MICHAEL KOHN: Your Honor, I need to
24 consult with Mr. Mosbaugh on the last line of questioning.

25 CHAIRMAN BLOCH: We'll be back at 1:30. Thank

1 you for this morning and enjoy your lunch.

2 (Whereupon, a luncheon recess was taken

3 at 12:00 noon, the hearing to resume at

4 1:30 p.m., the same day.)

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AFTERNOON SESSION1
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CHAIRMAN BLOCH: The hearing will come to order.

MR. BLAKE: Judge Bloch, over the lunch hour counsel talked about the schedule which we started early in the lunch hour with the judge there. Mr. Kohn would like to quit today after these witnesses are complete, and even if there's still hearing time left. He is -- he is tired, physically tired. I've agreed to that, and so is Ms. Young, if... So that's our recommendation to the Board on the schedule for -- remaining schedule for today.

We're all agreed to start at 8:30 tomorrow morning, and the first people tomorrow would be the I&C -- three I&C techs. They would be followed by Mr. Kitchens, if Mr. Kitchens is physically available, which we will check on this afternoon. If he's not, then I'll have to give you an update later on today. But that would be the order of business tomorrow.

Mr. Kohn also expressed a desire not to extend past 1:00 tomorrow. He understands if we were close to accomplishing something, that -- that that would be a different matter, but 1:00 is important to him tomorrow.

ADMINISTRATIVE JUDGE MURPHY: The Board has a preference not to go past 1:00, also.

MR. BLAKE: On the three I&C techs, at one

1 point there was an interest in bringing the instruments
2 with them. Is that still -- or do you want to see that
3 demonstration done at the plant when you make the plant
4 tour? Just let us know at this point, if you would, later
5 on this afternoon.

6 CHAIRMAN BLOCH: I know that I discussed at one
7 point the possibility of seeing the EG&G instrument used
8 with and without the flow meter at the plant, and I think
9 that probably will satisfy that need.

10 I want to clarify some things for the record
11 before we continue. One is that as I left Mr. Barth asked
12 me a question which I think, if I'd been less tired, I
13 would not have responded to, but I want to reveal the
14 conversation to the parties. Mr. Barth asked me what it
15 was that I meant when I was talking about "trending" on the
16 record, and he said the staff is sometimes confused about
17 what that might mean. And what I told him was that -- as
18 best I can recall, what I said was that I was thinking of
19 "trending" as being the ability of the plant to look at not
20 only an individual event that's happening, but a pattern of
21 events, so that they could be able to know how to resolve
22 problems at the plant by seeing a pattern. And it has to
23 do with root cause under Appendix B, in my opinion. And I
24 just thought the parties were entitled to hear that, since
25 I shared it with Mr. Barth off the record.

1 Second thing I want to share is that counsel
2 for Licensee asked me, in our scheduling discussion,
3 whether I'd had any ex parte communication with Mr. Kohn
4 about his tiredness, and over lunch I realized that in fact
5 I had. Two days ago when I saw him he looked very tired to
6 me; his eyes were watering. This morning when he walked in
7 he looked very tired to me. And I walked over to him and I
8 said, "You look very tired," and he said to me,

9 "I had only one and a half hours sleep last
10 night." And when Mr. Blake asked me I failed to recall the
11 "one and a half hour" comment. I want to reveal that on
12 the record.

13 Third thing to handle is that I've asked the
14 staff to provide me with the generic letter to which
15 Licensee responded, and what I believe is now Intervenor
16 Exhibit 13, and we have obtained that generic letter and
17 would like at this point to mark it as a Board exhibit.

18 MS. YOUNG: Well, the staff wanted it as an
19 exhibit.

20 CHAIRMAN BLOCH: Well, staff -- staff can do
21 that. Staff would like to mark it now?

22 MS. YOUNG: That's all right, unless you want
23 to make it...

24 CHAIRMAN BLOCH: No, please. No, the staff has
25 the copies.

1 MS. YOUNG: I think we're up to Staff II-68.
2 Bill, if you could check me. Let's try II-68. If it's
3 wrong I'll change it later. Yeah, we've marked a lot of
4 exhibits previously.

5 CHAIRMAN BLOCH: They don't do them in order,
6 so it'd be very difficult for you to keep track. So it's
7 -- it's staff -- so I'll -- I'll help them out because
8 they're so kind to provide this. Staff Exhibit II-68 shall
9 be marked. It is Generic Letter 88-14. It has a cover
10 letter consisting of a memorandum for all project managers
11 from Frank Maraglia, and the document consists of a total
12 of four pages, the last page of which has in the upper
13 right-hand corner the word "enclosure."

14 (The document referred to was marked
15 for identification as Staff Exhibit
16 II-68.)

17 MR. BLAKE: Judge Bloch, while we're
18 distributing documents, we were able to distribute this
19 afternoon rebuttal testimony of Mr. Hairston. It covers
20 just two topics which we had looked earlier to -- to
21 Mr. McCoy to cover. One is the survey of employees, and
22 the other one is the "cowboy cavalier attitude." And I've
23 indicated earlier that we wouldn't be able to make that
24 within the ten day commitment which I'd earlier made to
25 everybody, but that I hoped we'd get it out this week, and

1 in fact we do have it completed now and will distribute it.
2 Mr. Hairston's scheduled for September 8th.

3 CHAIRMAN BLOCH: I'd like to reveal that the
4 Board discussed schedule over lunch, and while we made no
5 final conclusions, 'cause we want to hear from other
6 people, we have inquired preliminarily as to the
7 availability of this room for the 13th, 14th, and 15th, and
8 the 18th through the 22nd. We don't know if that will
9 work.

10 It occurred to us that if there were a break in
11 the hearings the parties could commence their work on
12 findings, which could shorten the findings time. The
13 important thing is not whether we finish the witnesses, but
14 whether we finish the proceeding. So we don't want to --
15 we don't want to bias the outcome of this, but we've made a
16 preliminary inquiry about the possibility of being down
17 here for seven more days. Oh, and we also made a
18 preliminary inquiry about the possibility of leaving
19 materials down here during that time.

20 MR. BLAKE: I take it encompassed in that -- in
21 that schedule was no -- no schedule the week of September
22 5th?

23 CHAIRMAN BLOCH: That -- that's our notion
24 but...

25 MR. BLAKE: All right, I understand that.

1 ADMINISTRATIVE JUDGE CARPENTER: That's the
2 point, if you can work on beginning to get some
3 organization to the findings it wouldn't be lost time.

4 MR. BLAKE: I appreciate...

5 ADMINISTRATIVE JUDGE CARPENTER: And certainly
6 we're sensitive to the logistics of all the material that's
7 in back of you and in back of staff.

8 MR. BLAKE: Yes.

9 ADMINISTRATIVE JUDGE CARPENTER: Whether you
10 want to de-camp and re-camp or not is the question.

11 MR. BLAKE: I appreciate it. Thank you.

12 ADMINISTRATIVE JUDGE CARPENTER: It's not a
13 severe problem to the Board, but we are sympathetic to your
14 -- to the parties' problems.

15 CHAIRMAN BLOCH: So we want to welcome the
16 witnesses back, and charge.

17 CROSS EXAMINATION (Continued)

18 BY Mr. MICHAEL KOHN:

19 Q Gentlemen, if -- and as I understand it, an air
20 roll cranks the diesel?

21 A (Witness Johnston) That is correct.

22 Q And how much time is needed to get the engine
23 up to the minimum speed to sustain ignition?

24 A (Witness Johnston) I don't have an exact
25 number on that.

1 Q What speed is required to -- to have a
2 sustained combustion?

3 A (Witness Johnston) I don't have an exact
4 number for that.

5 Q Approximately?

6 A (Witness Johnston) We believe combustion
7 initiates at probably something around 50 rpm. That's --
8 that's approximate.

9 Q And there is 16 valves -- excuse me, 16
10 cylinders?

11 A (Witness Johnston) That is correct.

12 Q And they would all pulse once per revolution?

13 A (Witness Johnston) That's incorrect.

14 Q How many times would they pulse?

15 A (Witness Johnston) One-half time per
16 revolution. It's a four-stroke-cycle engine.

17 Q Does that mean -- can you explain what that
18 means?

19 A (Witness Johnston) Pardon?

20 Q Does that mean -- one-half time per revolution,
21 what...?

22 A (Witness Johnston) It's a four-stroke-cycle
23 engine. That means as the piston goes up the first time it
24 is on the compression stroke; as it comes back down it is
25 on the power stroke; as it goes up the next time it's on

1 the exhaust stroke; as it comes down the next time it's on
2 its intake stroke. Four stroke cycle.

3 Q So how many cylinders fire per revolution?

4 A (Witness Johnston) One-half of the number of
5 cylinders of the engine.

6 CHAIRMAN BLOCH: You know, these gentlemen
7 could give the answer you want if you ask the final
8 question, and then you could come back to this if they
9 didn't give you the answer you want.

10 BY MR. MICHAEL KOHN:

11 Q The answer's eight, correct?

12 A (Witness Johnston) For a 16 cylinder engine,
13 yes.

14 Q All right, if water and air -- if a water and
15 air mixture is in the quarter inch line, do you know what
16 the effect would be on the short pulses occurring during --
17 up to the 50 rpm speed?

18 A (Witness Johnston) Is this water in the liquid
19 state or water in the vapor state?

20 Q Liquid.

21 A (Witness Johnston) Is this water sufficient to
22 -- to block flow of air through that line?

23 Q Yes.

24 ADMINISTRATIVE JUDGE MURPHY: Which line are
25 you talking about, Mr. Kohn?

1 MR. MICHAEL KOHN: The quarter inch lines.

2 ADMINISTRATIVE JUDGE MURPHY: Which quarter
3 inch line?

4 CHAIRMAN BLOCH: It's the one we were talking
5 about before lunch.

6 MR. MICHAEL KOHN: To the -- to the pilots.

7 ADMINISTRATIVE JUDGE MURPHY: I'd just like the
8 record to be clear.

9 BY WITNESS JOHNSON:

10 A This becomes somewhat hypothetical. I mean, a
11 certain volume of water in a quarter inch line, given a 250
12 pound push, is essentially going to act as a piston within
13 that line. It's going to be an incompressible portion of
14 the fluid in that line shuttling back and forth with the
15 pressurization and venting of that -- of that tube.

16 Q But if it's not solid and it's a mixture of
17 water and air, then it wouldn't act as a piston, correct?

18 A (Witness Johnston) That's correct.

19 Q And then the effect could be a weak air roll?

20 A (Witness Johnston) No, I don't believe so.

21 Q Could the effect be not supplying pressure to
22 the pilot within the appropriate time?

23 A (Witness Johnston) Again we're in the
24 hypothetical. Given a sufficient length of tubing and a
25 sufficient quantity of water and a short enough duration of

1 the pulse signal, it is...

2 A (Witness Owyong) Are you asking the question
3 that on the quarter inch lines that there is water in all
4 16 lines?

5 Q Just in any line. Any or all.

6 A (Witness Owyong) Well, I would say if it was
7 all 16 lines then you wouldn't have a start.

8 A (Witness Johnston) I believe the answer to
9 your question is: No, I do not believe it will prevent
10 actuation of the starting air valve.

11 Q Could it affect the timing of the actuation in
12 the starting air valve?

13 A (Witness Johnston) It could -- it could affect
14 the duration. What I -- what I believe would occur is that
15 by slowing the transmission of the pressure to the pilot
16 actuation of the valve due to the presence of -- of a large
17 quantity of water in that tube, that you're causing the
18 acceleration of that engine...

19 I believe that you're causing a delay in the
20 transmission of the signal to that starting air valve which
21 will probably cause the acceleration of the engine to slow,
22 and you may end up with a slower start, yes. Given, again,
23 a large quantity of water in that tube.

24 CHAIRMAN BLOCH: And are you -- how many tubes
25 were you assuming would be affected?

1 WITNESS JOHNSTON: Well, I'm assuming -- I
2 think what he's... Can you repeat the question, please.

3 CHAIRMAN BLOCH: Okay, let -- let me complete
4 -- let me complete the suggestion I gave before. If you
5 don't understand the question well enough to answer it,
6 make sure that they clarify the question.

7 WITNESS JOHNSTON: Yes.

8 CHAIRMAN BLOCH: And Mr. Owyong, we'll want
9 your comment later, too, 'cause you made one comment in the
10 middle of Mr. Johnston's comment that suggested the
11 possibility that you may not have exactly the same opinion
12 as he has.

13 WITNESS OWYOUNG: Okay.

14 BY MR. MICHAEL KOHN:

15 Q If I -- your prior testimony was what would
16 happen if water was in one or -- one of the quarter inch
17 lines, correct?

18 A (Witness Johnston) No, I was thinking about
19 the accumulative effect of putting water in all of the
20 lines, and how that would affect the start.

21 Q And Mr. Owyong?

22 A (Witness Owyong) Well, my comment was
23 basically thinking that if water was in all the lines and
24 it would prevent the signal reaching the start valves, then
25 definitely you would not have a engine (sic) start.

1 CHAIRMAN BLOCH: So have you done any analysis
2 of whether or not water in these lines, either one piston,
3 two pistons, three pistons, would affect the engine enough
4 so that it could increase the chance of a weak air roll?

5 WITNESS JOHNSTON: No.

6 WITNESS OWYOUNG: I don't know of any testing.

7 CHAIRMAN BLOCH: Mr. Owyong, you said you
8 don't know of any testing, is that what you said?

9 WITNESS OWYOUNG: I don't know of -- yes, I
10 don't know of any tests -- testing done to our engine of...

11 CHAIRMAN BLOCH: Okay, and how about analysis?

12 WITNESS OWYOUNG: Oh, no analysis, either.

13 BY MR. MICHAEL KOHN:

14 Q Are you aware that in the wintertime the
15 ambient air is a lot drier than in the summer?

16 CHAIRMAN BLOCH: I'll take notice of that.

17 MR. BLAKE: I object to it.

18 CHAIRMAN BLOCH: Oh, okay.

19 MR. BLAKE: I don't know where he's talking
20 about, I don't know...

21 MR. MICHAEL KOHN: I just -- I was trying to
22 get there. In Augusta.

23 MR. BLAKE: It's not in the -- not in their
24 testimony. I have a variety of objections to the question.

25 MR. MICHAEL KOHN: At the plant -- in the

1 vicinity of Plant Vogtle.

2 CHAIRMAN BLOCH: Do you know whether the air is
3 drier in the vicinity of Plant Vogtle in the wintertime
4 than in the summertime?

5 WITNESS JOHNSTON: I have not studied the --
6 the weather reports of Plant Vogtle.

7 WITNESS OWYOUNG: And neither have I.

8 BY MR. MICHAEL KOHN:

9 Q Are you aware that it was a practice at Vogtle
10 to sometimes not run the air dryers in the winter because
11 the air was thought to be drier?

12 A (Witness Johnston) I'm not aware of that.

13 A (Witness Owyong) Nor -- nor am I.

14 CHAIRMAN BLOCH: Nor am I.

15 MR. MICHAEL KOHN: There is testimony from
16 Mr. Hunt to that effect.

17 BY MR. MICHAEL KOHN:

18 Q I'm going to call your attention to Page 14,
19 Line 15 of your testimony. And you -- Mr. Johnston, in
20 response, you mention the term "creep."

21 A (Witness Johnston) That's correct.

22 Q And

23 CHAIRMAN BLOCH: And for the reporter that's c-
24 r-e-e-p.

25 Q And you were looking at the creep phenomena to

1 explain the weak air rolls?

2 A (Witness Johnston) That is not a sole
3 explanation for the weak air rolls.

4 Q But that's why you're mentioning it here?

5 A (Witness Johnston) No.

6 Q What do you think is the importance of creep as
7 it -- as it related to the weak air rolls?

8 A (Witness Johnston) I believe that creep was a
9 factor in explaining the length of time it took for the
10 interference between the piston and the cap to manifest
11 themselves at -- at Vogtle.

12 Q And were you aware of conclusions drawn in the
13 November 25, 1995 Cooper report with respect to creep?

14 A (Witness Johnston) May I see a copy of that,
15 please.

16 (The witnesses were handed certain material.)

17 (The witness reviews certain material.)

18 MR. MICHAEL KOHN: I guess if we're showing the
19 witness the document it should be identified.

20 BY MR. MICHAEL KOHN:

21 Q This document is -- I think there's -- if I
22 understand correctly, there is your computer version which
23 is, as far as the wording goes, identical to the final
24 signed version, is that correct?

25 A (Witness Johnston) That's correct.

1 MR. MICHAEL KOHN: Okay. And that is -- and
2 last -- at the close of the hearing I was provided the
3 final signed version. And I haven't had opportunity to
4 photocopy that, but we can mark that or we can just use the
5 one that's in 225. Actually, I think, Georgia Power has
6 some additional copies, so I think maybe we should just
7 mark that one as...

8 CHAIRMAN BLOCH: We're grateful to Georgia
9 Power for supplying this, for the record. Counsel, you're
10 about to move to -- to mark those?

11 MR. MICHAEL KOHN: Yes. I believe it should be
12 Intervenor II-229. And I'm looking for some confirmation
13 for that.

14 (The document referred to was marked
15 for identification as Intervenor
16 Exhibit II-229.)

17 CHAIRMAN BLOCH: Let me ask, before going into
18 detail, do you know whether or not your testimony
19 concerning creep is consistent with this report?

20 WITNESS JOHNSTON: It is not.

21 BY MR. MICHAEL KOHN:

22 Q And that report was the final decision of
23 Cooper, correct? Final engineering position of Cooper?

24 A (Witness Johnston) This report was not
25 amended.

1 Q And isn't it true that before the report was
2 issued there was a earlier (sic) letter of November 15,
3 1991, stating what -- that creep would not explain the weak
4 air rolls?

5 A (Witness Johnston) I'm not familiar with what
6 you're referring to.

7 Q I'm going to show you a November 15, 1991
8 letter in -- contained in Intervenor II-225. It is the
9 fifth page into that exhibit. And on Page 2, under
10 "Conclusion 2," can you read that conclusion into the
11 record?

12 A (Witness Johnston) Yes. This statement says,
13 "Material creep or yielding does not appear to have
14 occurred in the bolt hole flanges of the cap. Any
15 permanent material deformation would most likely be
16 apparent as an improper flatness. All the caps were found
17 to be flat within two mil, as was the new cap."

18 Q Okay. And after that internal memorandum was
19 prepared, then the final report was prepared?

20 A (Witness Johnston) That is correct.

21 Q And the final report contains the same
22 conclusion?

23 A (Witness Johnston) Essentially, yes. It's not
24 worded the same, but it's the -- essentially the same
25 conclusion.

1 CHAIRMAN BLOCH: I'll note that that's on
2 Page 6 of Exhibit II-229 of Intervenor's.

3 MR. MICHAEL KOHN: I guess we -- I'll call for
4 the admission of II-229.

5 CHAIRMAN BLOCH: Granted.

6 (Intervenor Exhibit II-229 was
7 admitted into evidence.)

8 BOARD EXAMINATION

9 BY CHAIRMAN BLOCH:

10 Q I'd like to know from these gentlemen was there
11 anything that you learned after this report that was
12 submitted, that was not known to the people who prepared
13 the report?

14 A (Witness Johnston) No, our investigation into
15 this ended with this report.

16 Q So how did you come to reach a different
17 conclusion about creep than the report reached?

18 A (Witness Johnston) Let me explain a couple of
19 things. The report was authored by John Gildea. John is
20 an engineer who reported to me at the time that this report
21 was issued. You'll see my signature as the reviewer, and
22 it was approved by Greg Dozen who was the manager of the
23 engineering group at that time.

24 I worked closely with John in putting together
25 the test format to prepare this report, observing the way

1 that he conducted the -- the analysis, and I worked with
2 him while he prepared this report. I put forth the -- I
3 put forth the suggestion that creep played a factor in the
4 delay of or the period of time that elapsed between the
5 manufacture of these components and the time at which they
6 -- they failed in service. John Gildea, because he did not
7 know the original manufacturing condition of the -- the
8 components, could not either support or refute that
9 statement; though, because all he could evaluate was what
10 was in front of him, he could not include that creep was
11 present. And the components that he looked at were similar
12 to those which were in stock at the time of the report, a
13 period of time between manufacture and time of this report
14 of approximately ten years.

15 John Gildea...and I have discussed this with
16 him in preparation of my testimony last week...he agrees it
17 is conceivable that creep was -- was present; he has no way
18 to demonstrate it. You will note that John does not make a
19 statement in this report that explains why these valves
20 functioned for as long as they did, and then failed in the
21 July '90 time frame.

22 Q Are you expert in methods of analysis of
23 plastic deformation?

24 A (Witness Johnston) I am not -- I do not
25 present myself as expert. I am aware of plastic

1 deformation versus elastic deformation; I am aware of
2 analysis of stress and strain levels in components and have
3 a general working knowledge. But I will not present myself
4 as an expert.

5 Q Did you do or have performed any form of
6 appropriate engineering analysis that shows that creep
7 could have occurred in the way you've stated in your -- in
8 your testimony?

9 A (Witness Johnston) If I may, let me respond to
10 that by -- by saying in a very crude manner the world is
11 made of rubber. And as designers that's one of the first
12 things that we recognize. Any material subjected to any
13 stress deforms elastically; and given sufficient period of
14 time... and that depends on the state of temperature and
15 stress in the component...it will deform plastically.

16 These components are subjected to approximately
17 13,500 pounds of preload from each of the cap screws, each
18 of the two cap screws which attach it to the cylinder head.
19 And given a period of -- the engines were manufactured
20 around 1981. These caps would have been installed for the
21 majority of that time, subjected to that cap screw load.
22 It is very reasonable to suspect that some portion or some
23 amount of creep deformation would occur over that time.

24 Q And are there methods of determining whether
25 enough creep could have occurred to explain the problem?

1 A (Witness Johnston) That's beyond my expertise.

2 CROSS EXAMINATION (Continued)

3 BY MR. MICHAEL KOHN:

4 Q Okay, you used the word earlier "conceivable."
5 Have you determined -- I've used that term in front of this
6 Board before with...

7 CHAIRMAN BLOCH: He just said that he cannot
8 determine the amount quantitatively. It's just a seat-of-
9 the-pants judgment, let's say.

10 BY MR. MICHAEL KOHN:

11 Q Did you determine what stress is applied to the
12 cylindrical portion of the cap?

13 A (Witness Johnston) In the preparation of this
14 report, John Gildea attempted to construct a finite element
15 model of this and subject it to the loads. It produced
16 deformation of the bore that we knew was excessive, would
17 indicate -- his model would have indicated that this would
18 have failed at the initial installation, and we did not
19 carry it further. We were not able to make the model work.

20 BOARD EXAMINATION

21 BY CHAIRMAN BLOCH:

22 Q So you attempted methods of finite element
23 analysis and have not done any finite element analysis that
24 would convincingly demonstrate that the deformity would
25 occur, through creep?

1 A (Witness Johnston) Oh, the finite element
2 model showed a tremendous amount of deformation, more than
3 we knew existed in the component. Therefore, we scrapped
4 that model. We could not refine it and make it --

5 Q So you haven't refined it in a way that
6 prevents -- that provides a valid model that would
7 demonstrate the amount of creep.

8 A (Witness Johnston) That's correct.

9 CROSS EXAMINATION (Continued)

10 BY MR. MICHAEL KOHN:

11 Q And what you did confirm was that the
12 deformation of creep would have been -- excuse me -- the
13 deformation would have been immediate.

14 A (Witness Johnston) There is an immediate
15 deformation which is induced by the loading of the cap
16 screws in themselves. I believe that's stated in my
17 testimony. There is also a deformation which occurs -- a
18 further deformation which occurs very slowly over long
19 periods of time, attributed to creep.

20 Q Were you aware that Georgia Power calibrated
21 Calcon sensors on March 30, 1990 for installation into the
22 diesels?

23 A (Witness Johnston) Yes.

24 Q And were you aware that the calibration
25 procedures used to install those Calcons -- excuse me -- to

1 calibrate the Calcons was the same procedure that had been
2 used prior to the site area emergency?

3 A (Witness Johnston) I don't know.

4 A (Witness Owyong) I don't know either.

5 Q You have no reason to believe that the
6 procedure was altered?

7 A (Witness Owyong) That's correct, I have no
8 reason to believe it was altered.

9 Q Would you look at your testimony on page 12,
10 line 17? There, you're discussing whether under corrosion
11 the engine should continue to fail -- basically your theory
12 is that under the water scenario, it couldn't be valid
13 because the engine would continue to fail.

14 A (Witness Johnston) That's not exactly what I
15 said here.

16 Q Is that what you mean, or could you explain
17 what you mean?

18 A (Witness Johnston) I was responding to a
19 question that asked "If water in the starting air system
20 caused corrosion and would restrict air flow, corrosion
21 could cause parts of the air start valve to stick and bind
22 and not pulse the starting air to the diesel properly,
23 causing weak air rolls and the failure of the diesel to
24 start." My response was, "Hypothetically, if I believe all
25 the above to be true and water causes this corrosion, then

1 the engine could fail to start."

2 Q Then you say, "Under this scenario, however,
3 the engine should continue to fail, unlike what occurred
4 with the Vogtle diesels in the January to July 1990 time
5 frame." Under your scenario of it being a clearance
6 problem, should the same thing have occurred?

7 A (Witness Johnston) With the clearance problem,
8 I think the prime factor which affected the performance of
9 those valves was the temperature of the components. As the
10 temperature changed, the interference either went away or
11 it could become more severe.

12 BOARD EXAMINATION

13 BY CHAIRMAN BLOCH:

14 Q Why would that be any different if the problem
15 with the clearance was caused by corrosion? You had
16 deformation plus corrosion -- or rather you had out of
17 roundness plus corrosion. Why wouldn't that also be
18 intermittent?

19 A (Witness Johnston) When I considered the
20 question, I envisioned corrosion products to be typical of
21 rust deposits, having reasonable dimensions to them on the
22 order of maybe a mill or more. I considered those deposits
23 in there to cause an essentially permanent binding of the
24 components because they can't tolerate that kind of
25 contamination.

1 Q And do you know whether or not there could be
2 rust or corrosion of less than a mill?

3 A (Witness Johnston) Again, that's what I
4 assumed when I responded to the question. Certainly
5 corrosion products could come in a wide variety of size.

6 Q So do you know whether or not there could be
7 corrosion of less than a mill?

8 A (Witness Johnston) No, I don't.

9 CROSS EXAMINATION (Continued)

10 BY MR. MICHAEL KOHN:

11 Q Couldn't rust just cause increased friction and
12 that would continue to be intermittent?

13 A (Witness Johnston) Very, very minor amounts of
14 it, yes, that's possible.

15 Q Is there a wear limit for the piston to cap
16 clearance?

17 A (Witness Johnston) Yes, there is a published
18 limit.

19 Q And with continued operation of the diesel, you
20 would expect the clearances to increase?

21 A (Witness Johnston) Quite honestly, no, because
22 these components function so infrequently with no
23 significant loads applied to them, I do not expect these to
24 wear.

25 Q They would increase at least in some order of

1 magnitude?

2 A (Witness Johnston) Yes.

3 Q They wouldn't decrease with wear.

4 A (Witness Johnston) Correct..

5 Q And if there was an initial manufacturing
6 defect, why would weak air rolls first occur years later
7 rather than at the beginning?

8 A (Witness Johnston) That is precisely the point
9 that I was trying to make earlier with regard to the
10 difference of my conclusion with that published in this
11 report.

12 Q I'm sorry, I didn't follow your response.

13 A (Witness Johnston) Again, I do not feel that
14 this report, which you presented to me, which I think you
15 took back from me again --

16 CHAIRMAN BLOCH: Let the record show that the
17 witness is referring to Intervenor II-229.

18 A (Witness Johnston) This report does not
19 provide a basis for why these valves functioned between the
20 time of manufacture and the July 1990 time frame.

21 Q If initial manufacturing -- if it wasn't --

22 BOARD EXAMINATION

23 BY CHAIRMAN BLOCH:

24 Q Mr. Johnston, is it fair to say that at the
25 present time, you haven't done any analyses that would

1 convincingly persuade -- that would be convincing
2 concerning why there was this initial period of running
3 successfully followed by the problem?

4 A (Witness Johnston) If I need to provide
5 calculations to show the degree of creep deformation, I'm
6 not able to do so. And if that's required to convincingly
7 convey my theory on why these valves functioned for a
8 period of time before July 1990, then no, I cannot provide
9 that.

10 Q But your general feeling about these materials
11 are that that's a plausible explanation, but there's no
12 analysis to support it, is that right?

13 A (Witness Johnston) That's correct.

14 CROSS EXAMINATION (Continued)

15 BY MR. MICHAEL KOHN:

16 Q How many other plants have experienced the
17 exact same problem that occurred at Plant -- how many other
18 nuclear facilities have experienced the same problem that
19 occurred at Plant Vogtle with respect to the weak air
20 rolls?

21 A (Witness Johnston) Prior to the July 1990 time
22 frame, I'm only aware of one other nuclear facility that
23 experienced problems with starting that was attributed to
24 the starting air system, specifically the distributor
25 starting air valve relationship. That was River Bend, that

1 resulted in a Part 21 notification and attributed the
2 problem to an inability to -- excuse me, let me back up --
3 it attributed the problem to an excessive accumulation of
4 oil in the pilot valves of the starting air distributor.

5 Since the July 1990 time frame, we have
6 incorporated the starting air valve pop test at all the
7 facilities that Cooper does turnkey outage maintenance, and
8 that includes River Bend, Grand Gulf, Vogtle, Commanche
9 Peak. Commanche Peak, we have discovered problems with
10 some of the valves that caused us to change the caps and
11 pistons out on a wholesale basis throughout the engine.
12 I'm not personally familiar with the experience at River
13 Bend, though the nature of this problems suggests that our
14 earlier conclusion about the cause of failure at River Bend
15 may have been inaccurate and it may have actually been this
16 same interference between the cap and piston.

17 Q Rather than your Part 21 analysis about oil
18 blockage?

19 A (Witness Johnston) That is possible.

20 Q Or is it also possible that your Part 21 with
21 respect to Plant Vogtle is in error and that blockage due
22 to water could be the cause?

23 A (Witness Johnston) I do not believe so,
24 because part of the investigation into the failure of the -
25 - the fail to start in July 1990 initially checked for the

1 presence of oil and found those lines to be clear of oil or
2 water.

3 BOARD EXAMINATION

4 BY CHAIRMAN BLOCH:

5 Q Let me clarify. Has there been any other plant
6 in which a weak air roll has been confirmed as a result of
7 the characteristics of the caps?

8 A (Witness Johnston) No.

9 CROSS EXAMINATION (Continued)

10 BY MR. MICHAEL KOHN:

11 Q And all the nuclear units have the same caps and
12 pistons?

13 A (Witness Johnston) No.

14 Q What are the differences?

15 A (Witness Johnston) In line engines, such as
16 that at River Bend, had a slight modification to the cap to
17 accept two pilot signals from redundant distributors, as
18 opposed to only one pilot signal on the V engines.

19 BOARD EXAMINATION

20 BY CHAIRMAN BLOCH:

21 Q So how many of these plants have the same
22 specifications for their caps?

23 A (Witness Johnston) Dimensionally they're all
24 the same. Again, it's only the arrangement of the
25 redundant distributors on the V -- excuse me -- on the in

1 line engine that make the caps slightly different.

2 Q So how do you account for the fact that the
3 deformation problem caused weak air rolls only at Vogtle?

4 A (Witness Johnston) As I stated, -- as I
5 believe that I stated, since we have begun the testing by
6 the pop start method or by the air pop test, we have found
7 failure of other valves to perform to this pop test. Now
8 one valve seizing on a start can go undetected, the engine
9 will roll right past it -- it can. So I believe that this
10 problem did affect other installations, though not to the
11 point to cause a noticeable weak air roll or a fail to
12 start.

13 Q Did some of the installations run their diesels
14 for a longer period of time than Vogtle?

15 A (Witness Johnston) To the best of my
16 recollection, the first standby diesels, the first
17 Enterprise standby diesels to go in service were at San
18 Onofre and that was approximately 1978. Correct?

19 A (Witness Owyong) That sounds about right,
20 yeah.

21 A (Witness Johnston) That would have probably
22 been followed by --

23 Q Let's stop with San Onofre. Wouldn't you expect
24 if the problem was creep and the creep was actually
25 proceeding faster than wear, than San Onofre would have

1 experienced this problem?

2 A (Witness Johnston) It's conceivable. Again,
3 you would have to very accurately identify the initial
4 conditions, the initial out of round state of the bore, the
5 minimum diameter of that bore, the O.D. of the piston, the
6 preload on the cap screws, all of these -- and the standby
7 temperature of the engine. One thing that's a little bit
8 unique about Plant Vogtle is that the standby temperature
9 is kept a bit higher here than it is at most other of our
10 sites, further aggravating this phenomenon of the
11 differential of thermal expansion.

12 CROSS EXAMINATION (Continued)

13 BY MR. MICHAEL KOHN:

14 Q Would you look at Exhibit F to your testimony,
15 GPC 166?

16 A (Witness Johnston) Yes.

17 Q Is the list of utilities and sites the ones
18 that you are aware that have your diesels?

19 A (Witness Johnston) This listing is restricted
20 to domestic nuclear applications.

21 Q So the list would actually be longer?

22 A (Witness Johnston) That's correct.

23 Q And none of these places have ever had a weak
24 air roll attributed to creep -- the pinching phenomenon
25 that you have described?

1 A (Witness Johnston) Not to my knowledge.

2 BOARD EXAMINATION

3 BY CHAIRMAN BLOCH:

4 Q Were there any abroad?

5 A (Witness Johnston) Not to my knowledge.

6 CROSS EXAMINATION (Continued)

7 BY MR. MICHAEL KOHN:

8 Q Just to clarify, what is the temperature
9 difference at Plant Vogtle that you were talking about, as
10 compared to the others?

11 A (Witness Johnston) I can only approximate
12 that. Do you want the approximation?

13 Q Yes, sir.

14 A (Witness Johnston) I believe that Plant Vogtle
15 keeps their jacket water in the keep warm state around 162
16 to 163, other sites are generally in the 140 to 150 range.

17 Q None of the others have a 160 range?

18 A (Witness Johnston) Not that I'm aware of.

19 Q Look at page 15, line 8 of your testimony, your
20 creep deformation analysis assumes a .001 inch diametrical
21 clearance, is that correct?

22 A (Witness Johnston) We started with
23 approximately a one-thousandths minimum clearance.

24 Q And that is -- your testimony only reflects
25 that clearance, correct?

1 A (Witness Johnston) That's correct.

2 CHAIRMAN BLOCH: Let me clarify for the record,
3 because I think counsel may have garbled it. It's
4 diametrical clearance.

5 BY MR. MICHAEL KOHN:

6 Q And the specification is actually between .001
7 and .003, correct?

8 A (Witness Johnston) At the time of the
9 manufacture of these components that was correct.

10 Q And if you use the average or upper limit, you
11 would draw a different conclusion, wouldn't you?

12 A (Witness Johnston) That is correct.

13 Q And are you aware of the actual clearances?

14 A (Witness Johnston) During the inspection of
15 the components removed during July of 1990, we found the
16 minimum clearances to be approximately one-thousandths --
17 can I correct a statement I made earlier?

18 CHAIRMAN BLOCH: Please.

19 WITNESS JOHNSTON: This regards --

20 CHAIRMAN BLOCH: You may always correct a
21 statement if you find something that makes you think it can
22 be more accurate, even after you've left here.

23 WITNESS JOHNSTON: This regards a comparison of
24 Vogtle experience with that of other installations.

25 In Exhibit II-229, which is starting air valve

1 investigation, on page 2 of that report, Mr. Gildea gives a
2 brief design history of the dimensional tolerances applied
3 to these components. He indicates that in 1977,
4 dimensional changes to the drawings resulted in a
5 diametrical clearance of one to four mills -- pardon me --
6 what he says is "A change in 1977 resulted in a diametrical
7 change from an original specification of one to four mills,
8 to a revised specification of 1.5 to 4.5 mills. A further
9 change in June of 1978 again revised those dimensions
10 resulting in a diametrical clearance of one to three
11 mills." So between components manufactured between the
12 time frame of February '77 to June of '78 had a greater
13 clearance than those manufactured after 1978.

14 To determine which sites had the greater
15 clearance, we would have to look at the manufacturing dates
16 of the engine. But I can say domestically, Plant Vogtle --
17 correct me if I'm wrong, Sheldon -- of the domestic
18 installation, Plant Vogtle were the last produced by
19 Enterprise -- no, let me correct that. The last ones
20 produced by Enterprise were installed at the Rancho Seco
21 installation, which is now decommissioned. Prior to that,
22 the last engine manufactured for domestic service were
23 Plant Vogtle, in 1981.

24 CHAIRMAN BLOCH: And the Vogtle clearance was
25 one to three mills?

1 WITNESS JOHNSTON: That's correct. The
2 specification for parts supplied with the Vogtle engine
3 were one to three mills.

4 CHAIRMAN BLOCH: Am I correct in inferring that
5 the San Onofre must have been one to four mills?

6 WITNESS JOHNSTON: Yes, San Onofre would have
7 been built -- it's a 1975 sales order, I believe it was
8 built around 1976 or 1977. That was the time when we built
9 most of the nuclear units.

10 MR. MICHAEL KOHN: Your Honor, this is a good
11 time for our hourly break.

12 CHAIRMAN BLOCH: We'll take a ten minute break.

13 (A short recess was taken.)

14 CHAIRMAN BLOCH: The hearing will come to
15 order.

16 Mr. Kohn, a time estimate please. Not what
17 time that it is, but the time you plan to take.

18 MR. MICHAEL KOHN: Oh, I think we're within
19 half hour of completing.

20 CHAIRMAN BLOCH: Okay, thank you.

21 Is Mr. Johnston in the area?

22 If you ask any questions of Mr. Owyong right
23 now, Mr. Johnston is not present, so we can't be sure that
24 he would say the same thing.

25 MR. MICHAEL KOHN: All right.

1 MR. BLAKE: Mr. -- hold on just for a moment,
2 on the schedule. Mr. Kitchens is not available tomorrow
3 because of plant operations needs, so he cannot be here.
4 I'll continue to work with counsel this afternoon and if
5 there can be anybody else in addition to the three I&C
6 techs, I'll let the Board know.

7 But Georgia Power's input is to maintain the
8 schedule in Washington, go the week of -- just as you had
9 the schedule -- just as everybody had set their schedule
10 before. We appreciated the Boards' willingness to consider
11 flexibility, and at least that's our input.

12 CHAIRMAN BLOCH: And let me just ask about
13 that. Does that mean that you would want to continue in
14 Washington with the expectation we can handle the rest of
15 the hearing in Washington, or will there still be a trip
16 back to Augusta?

17 MR. BLAKE: I don't really know for sure. I
18 think that we can clearly fill those two weeks of hearing
19 with just our rebuttal witnesses, and what I'm anticipating
20 from the pace of the cross that it is taking on those
21 rebuttal, there won't be days lost during those two weeks.
22 I also think that -- I don't know exactly what Mr. Kohn has
23 in mind for finishing his case, I thought that was solely
24 the loss of Mr. McCoy who he has to now ask some questions
25 of other witnesses and the expectation is that those would

1 be witnesses somewhere around Mr. McCoy, maybe Bockhold,
2 maybe Hairston. They're going to be appearing as rebuttal
3 witnesses, it seems to me we'll probably be able to
4 accomplish it at the same time in Washington. So I don't
5 know if we'll ever have to wind up coming back, Judge. I'm
6 not as good a predictor in this case, frankly, as I have
7 been in past cases.

8 MR. MICHAEL KOHN: I had thought we were going
9 to handle this as a matter tomorrow, and I'd just like to
10 get done with this witness as quick as possible.

11 CHAIRMAN BLOCH: I think let's do that. Good
12 point.

13 BY MR. MICHAEL KOHN:

14 Q Gentlemen, it's my understanding that the caps
15 have some sort of resistant coating to corrosion?

16 A (Witness Johnston) That's correct.

17 Q And what is that coating?

18 A (Witness Johnston) It's called Parko Lubrite.
19 It's an iron manganese phosphate coating.

20 Q And when the caps were machined, would this
21 removed that coating?

22 A (Witness Johnston) No, the coating is applied
23 after final machining.

24 Q I'd like to call your attention to Intervenor's
25 II-226, which -- and the first document appearing after the

1 pink page, which is a -- which begins "Georgia Power 2-A,
2 76023" on the top line. Do you have that document in front
3 of you?

4 A (Witness Johnston) It' not identified by
5 number, but yes, the top of it is "Georgia Power 2-A,
6 76023."

7 Q And in this document, you report slow, quote,
8 sluggish, unquote, roll for full five seconds. Do you see
9 that?

10 A (Witness Johnston) That's correct.

11 ADMINISTRATIVE JUDGE MURPHY: Could we identify
12 this document as to what it is?

13 CHAIRMAN BLOCH: It's identified on the cover
14 as Robert A Johnston's Personal Notes Relating to July 1990
15 Starting Air Valve Problem.

16 BY MR. MICHAEL KOHN:

17 Q Is that your understanding of what this
18 document is, sir?

19 A (Witness Johnston) That's correct.

20 Q And do you know when you began making this log?

21 A (Witness Johnston) This log was maintained --
22 entries were made during my troubleshooting effort and at
23 the conclusion of each day.

24 Q And is this -- is the first page attached to
25 the pink cover sheet -- would this then be the first page

1 of your log book with the entry related to the air rolls?

2 A (Witness Johnston) I believe that to be the
3 case. You didn't provide me with the whole thing, but I
4 believe that that's where I started my log.

5 (A document was proffered to the witness.)

6 WITNESS JOHNSTON: Thank you.

7 CHAIRMAN BLOCH: Do we know, therefore, what
8 the date of this first event is?

9 WITNESS JOHNSTON: I didn't date that entry.
10 Four pages later, I have a date of 7/13/90. My
11 recollection is that this would have been July 12, but I
12 don't know that for certain. I was only on site for a few
13 days to perform this troubleshooting.

14 BY MR. MICHAEL KOHN:

15 Q And does this accurately reflect what
16 occurred -- I'm referring to the second and third lines of
17 this document, which states "Report slow, sluggish roll for
18 full five seconds."

19 A (Witness Johnston) That's correct.

20 Q And later on towards the bottom, you say "Three
21 of four historical engine failure to starts have been on
22 the left bank distribution, one was with both banks...."

23 CHAIRMAN BLOCH: I think it's "distributor."

24 WITNESS JOHNSTON: That's correct.

25 MR. MICHAEL KOHN: Thank you.

1 BY MR. MICHAEL KOHN:

2 Q "...one with both banks...."

3 A (Witness Johnston) "...operable."

4 Q And is that also a true statement?

5 A (Witness Johnston) That was my understanding
6 at the time.

7 BOARD EXAMINATION

8 BY CHAIRMAN BLOCH:

9 Q What was the understanding based on?

10 A (Witness Johnston) That would have been
11 reports by customers personnel, the customer being Georgia
12 Power.

13 CROSS EXAMINATION (Continued)

14 BY MR. MICHAEL KOHN:

15 Q And with both banks operable is a safety mode
16 of operations?

17 A (Witness Johnston) Both banks are operable in
18 a safety injection signal.

19 MR. MICHAEL KOHN: We call for the admission of
20 page -- it'd be the first page after the cover pink sheet
21 of Intervenor's 226 with the heading "Georgia Power 2-A,
22 76023" at the top.

23 CHAIRMAN BLOCH: We'll admit the document for
24 the purposes for which the questioning was just made, we'll
25 admit the whole document, but for that purpose.

1 (The document, heretofore marked as
2 Intervenor II-226, was received in
3 evidence.)

4 BY MR. MICHAEL KOHN:

5 Q And there was more work completed on the other
6 diesels after you left concerning the weak air start rolls,
7 correct?

8 A (Witness Johnston) Lessons learned from the
9 troubleshooting of the 2-A diesel were carried over to
10 inspections that were performed on the remaining three
11 engines after I left.

12 Q And you were not present for those inspections?

13 A (Witness Johnston) That's correct.

14 Q Would a leak big enough so that snoop blew back
15 in the technician's face be of a size greater than .006
16 inch orifice?

17 A (Witness Owyong) I don't know.

18 A (Witness Johnston) I would say not
19 necessarily, because again, 006 at 60 psi is still moving a
20 significant amount of air and snoop is a very sensitive
21 inspection, so it could be a -- it would be a dramatic
22 finding to find a six-thousandths leak at 60 psi using
23 snoop.

24 Q Is snoop sensitive to making bubbles?

25 A (Witness Owyong) Yes.

1 A (Witness Johnston) Yes.

2 Q Is it sensitive to blowing back in someone's
3 face?

4 A (Witness Johnston) When it's propelled by
5 compressed air, yes, if your face is in the direction that
6 it's being propelled.

7 Q So then you would need a big leak to blow the
8 snoop into a technician's face?

9 A (Witness Johnston) You need a leak of
10 sufficient size to push the snoop whatever distance it is
11 to the technician's face.

12 CHAIRMAN BLOCH: The testimony is that this big
13 loop could be smaller than .006.

14 BY MR. MICHAEL KOHN:

15 Q And it could also be larger, couldn't it?

16 A (Witness Johnston) Yes.

17 A (Witness Owyong) Yes.

18 Q If you would turn to Intervenor's 223 -- II-
19 223, which is a copy of Mr. Johnson's personal outage
20 notes, and the entry for 3/18/90, and about the fifth page
21 after that entry, on the top should be "Right bank pressure
22 switch reset at 231."

23 A (Witness Johnston) Okay, can you please
24 redirect me to where I need to be looking?

25 CHAIRMAN BLOCH: Okay, you've got to first look

1 for the entry for 3/18/90, which at the top says,
2 "Saturday, 3/18/90." At the bottom of that page is a "1"
3 and then right next to the "1" a "2" with a line through
4 it. And then you've got to go five pages after that,
5 starts "Right bank pressure" on the top of the page.

6 WITNESS JOHNSTON: Okay, I've just now found
7 3/18/90. Where do I need to be looking on this page?

8 MR. MICHAEL KOHN: Five pages further, with
9 "Right bank pressure" at the top.

10 BY MR. MICHAEL KOHN:

11 Q The last sentence on that page says, "I have
12 great trouble dealing with one logic board schematic, four
13 is ridiculous." Can you tell me what you mean?

14 A (Witness Johnston) Taken in the context that
15 these were my personal notes, intended for me personally,
16 it was a sarcastic statement, I am not the expert on the
17 control panel logic here and I am somewhat slow in my
18 ability to work through the logic. Again, working with one
19 logic board, to me is difficult enough, and four, as is the
20 case here at Vogtle, was quite a challenge for me.

21 CHAIRMAN BLOCH: So you weren't talking about a
22 board number four, it's saying all four.

23 WITNESS JOHNSTON: No, I'm referring to the
24 schematics.

25 BY MR. MICHAEL KOHN:

1 Q Are you saying something about the drawings
2 that were existing?

3 A (Witness Johnston) That's correct.

4 Q And what were you saying about the problem with
5 the drawings?

6 A (Witness Johnston) It was simply -- again,
7 it's a statement which was just some personal notation that
8 I was frustrated in trying to read schematics that dealt
9 with four logic boards.

10 Q Are you saying that Vogtle's were harder to
11 read than other plants?

12 A (Witness Johnston) That's correct.

13 BOARD EXAMINATION

14 BY CHAIRMAN BLOCH:

15 Q Could you explain that?

16 A (Witness Johnston) Not all plants have what we
17 refer to as a motherboard and all the little baby boards,
18 and there are four of the little individual logic boards
19 attached to a motherboard. Most of our facilities only
20 have one shutdown board.

21 CROSS EXAMINATION (Continued)

22 BY MR. MICHAEL KOHN:

23 Q Is the logic the same at the other plants?

24 A (Witness Johnston) No, they vary from site to
25 site.

1 Q And so water entering the Plant Vogtle system
2 could have -- has a greater chance of fouling the logic
3 perhaps than the others?

4 A (Witness Johnston) I don't feel that to be
5 true.

6 CHAIRMAN BLOCH: Have you analyzed it?

7 WITNESS JOHNSTON: No.

8 BY MR. MICHAEL KOHN:

9 Q So not only is the logic different, the
10 physical layout of the panel would also be different?

11 A (Witness Johnston) Yes, those vary from site
12 to site. Perhaps to get a perspective on this, the
13 customer can be very explicit in the control function that
14 they want, and then the control engineering department
15 designs the system to meet the requirements of the
16 contract. And as has been stated many times, while not
17 everyone is a diesel expert, everyone considers themselves
18 a controls expert, so we tend to find very detailed control
19 specifications and the engine specifications can be quite
20 vague at times.

21 Q Previously you mentioned that if the pressure
22 in a trip line dropped below a certain point, you could get
23 a trip of the diesel. Can you tell me what that pressure
24 would have to drop to?

25 A (Witness Owyong) Going by memory, I would

1 think it's 40 psi.

2 Q I'm going to read you a statement that would
3 apply -- let's assume that it's applying to the diesel
4 after the 60 seconds. "As far as the function of the
5 control logic, is there any difference between the venting
6 of a Calcon sensor so as to exceed the makeup supply of air
7 and the restriction of the makeup air supply so as to be
8 less than the leakage rate from the trip line?"

9 A (Witness Johnston) You're not going to like
10 this. Could you repeat that please?

11 ADMINISTRATIVE JUDGE MURPHY: Can you show it
12 to him?

13 (A document was proffered to the witness.)

14 WITNESS JOHNSTON: Thank you.

15 CHAIRMAN BLOCH: I think he's asking whether
16 there's any difference between losing air from a leak and
17 failing to make it up through the makeup system.

18 WITNESS JOHNSTON: I think the only difference
19 would be the amount of time that it takes for that line to
20 drop to the trip point.

21 MS. YOUNG: Mr. Kohn, are they reviewing a
22 document that's been marked or is that one of your
23 questions --

24 MR. MICHAEL KOHN: No, that was just a
25 typewritten statement as to what I read.

1 BY MR. MICHAEL KOHN:

2 Q And could the events that you were just -- that
3 I read into the record previously happen on an emergency
4 trip -- excuse me, on an emergency start?

5 A (Witness Johnston) You have to be specific in
6 which line that you want to vent.

7 Q One of the ones associated with the emergency
8 trip signals.

9 A (Witness Johnston) Yes. Am I speaking out of
10 turn?

11 A (Witness Owyong) If you're referring to the
12 venting of either jacket water sensor or lube oil sensor,
13 yes, that is correct.

14 A (Witness Johnston) And may I amend that? Now
15 we're talking about operating in a safety injection mode or
16 the shutdown bypass, even if we vent a line to a jacket
17 water device, jacket water temperature device or a lube oil
18 pressure device, venting of the one line will not cause a
19 trip. It will cause a sensor malfunction alarm that then
20 requires a second device in that same circuit to vent to
21 effect a shutdown.

22 Q You're referring to the two out of three logic?

23 A (Witness Johnston) That's correct.

24 A (Witness Owyong) Yes.

25 Q Would you say -- if you would look at page 16,

1 lines 1 through 8 of your testimony, you provide an opinion
2 as to the professional manner of Georgia Power's
3 investigation following the March 20 site area emergency.

4 Are you aware that certain root cause evidence was lost?

5 A (Witness Johnston) No.

6 A (Witness Owyong) No, I wasn't.

7 Q Are you aware that the as-found condition had
8 not been preserved and documented in all respects?

9 A (Witness Owyong) No.

10 A (Witness Johnston) No.

11 Q I think in the course of cross examination, we
12 did point out that the leaks were not documented, is that
13 correct?

14 A (Witness Johnston) No, I don't believe we did.

15 BOARD EXAMINATION

16 BY CHAIRMAN BLOCH:

17 Q Well, to clarify, didn't you state that because
18 the snoop test was done first, that by the time you got to
19 the lines, you were unable to document the full dimensions
20 of the leaks that existed after the event?

21 A (Witness Johnston) I understood his question
22 to be that leaks were found that were not documented, and I
23 recall seeing transcripts in the preparation for this trial
24 -- seeing transcripts of conversations I believe with the
25 IIT that described the findings of those leaks using snoop.

1 Q Okay, so the leaks were documented but the
2 question remains, were the magnitude of the leaks properly
3 documented?

4 A (Witness Johnston) Not with reference to their
5 leak rate with the bubble tester.

6 CROSS EXAMINATION (Continued)

7 BY MR. MICHAEL KOHN:

8 Q Nor with respect to which lines they were
9 leaking from.

10 A (Witness Johnston) I don't know.

11 Q Or with respect to the exact number of leaks.

12 A (Witness Johnston) I seem to remember seeing
13 in this same transcript, seeing the numbers of leaks that
14 were found.

15 Q What transcript are you referring to?

16 A (Witness Johnston) Again, this is a transcript
17 of a meeting that was held at Vogtle, I believe it included
18 Mr. Chaffee and Mr. Kendall, I believe -- recalling from
19 memory and I don't know the accuracy -- I believe it had
20 Mr. Briney, Mr. Owyong, Mr. Stokes. It preceded the April
21 2 meeting and it discussed calibration of sensors and it
22 discussed the snoop of the various sensor lines.

23 Q Were you aware that leaks were corrected on the
24 night of March 20?

25 A (Witness Johnston) I don't recall dates.

1 Q That was before you got to the site.

2 A (Witness Johnston) No, I was on the site since
3 March 3rd, I believe.

4 Q You're correct, I'm sorry. Are you aware that
5 sensors were recalibrated without recording -- in fact, the
6 high jacket water temperature sensors were recalibrated
7 without recording the as-found condition?

8 A (Witness Johnston) No, I'm not.

9 Q Let me rephrase it, I think I misspoke. Are
10 you aware that a high jacket water temperature sensor was
11 recalibrated before it was sent to Wyle Labs?

12 A (Witness Johnston) Yes, I am, I believe that's
13 documented in NUREG 14 -- I keep stumbling on this -- 14.10
14 or 14.60?

15 CHAIRMAN BLOCH: 14.10.

16 BY MR. MICHAEL KOHN:

17 Q And at the time of April 3, 1990 when you left,
18 there were still unresolved issues, weren't there?

19 A (Witness Owyong) I think it was unresolved as
20 far as determining what was the cause of the first
21 shutdown.

22 A (Witness Johnston) Correct. Unresolved issues
23 also included the Wyle inspection of the sensors, the
24 inspection performed by myself in San Leandro of the Calcon
25 B-4400 pressure trips and the logic board, and I'm sure

1 there were other items I don't recall.

2 Q And were you satisfied with Georgia Power's --
3 with the adequacy of Georgia Power's recalibration
4 procedures for the Calcon sensors?

5 A (Witness Johnston) The recalibration procedure
6 that was used prior to our leaving the site on April 3, I
7 believe to be the same as the calibration procedure used
8 prior to the March 20th event, and no, we're not entirely
9 satisfied with it.

10 A (Witness Owyong) My recollection is that Gary
11 Hazelitt was on site and was overseeing the calibration or
12 looking at those particular components. And I don't
13 remember if he was still on site when we left or he left
14 before that, but my recollection is that i think he wrote a
15 procedure or revised the procedure for Georgia Power. I'm
16 not clear on which one.

17 BOARD EXAMINATION

18 BY CHAIRMAN BLOCH:

19 Q By the time you left, had there been a
20 compilation of the history of the Calcon sensors on site to
21 see if there were any commonalities in failures that were
22 occurring?

23 A (Witness Johnston) Yes, there was.

24 A (Witness Owyong) Yes.

25 CROSS EXAMINATION (Continued)

1 BY MR. MICHAEL KOHN:

2 Q And you really have no basis of the adequacy of
3 the -- of Georgia Power's actions after you left the site.
4 You weren't there to observe them, were you?

5 A (Witness Owyong) That's correct.

6 A (Witness Johnston) That's correct.

7 Q And you did not attend the April 9, 1990
8 presentation to NRC, did you?

9 A (Witness Johnston) That's correct.

10 A (Witness Owyong) That's correct.

11 Q And did you -- do you think --

12 CHAIRMAN BLOCH: Mr. Kohn, we assume that they
13 left on the 3rd, they weren't there for something after the
14 3rd.

15 MR. MICHAEL KOHN: The presentation was in
16 Atlanta.

17 BY MR. MICHAEL KOHN:

18 Q Do you assume that Georgia Power maintained
19 some form of log of its own to document what was occurring
20 during the site area emergency -- I mean after the site
21 area emergency?

22 A (Witness Johnston) I would make that
23 assumption.

24 Q And that would be part of your assumption in
25 determining whether Georgia Power was conducting its

1 investigation in a professional manner?

2 A (Witness Johnston) My statement on that was
3 limited to the time frame that I was on site.

4 Q I understand that, but part of the underlying
5 assumption to your conclusion is the fact that you would
6 assume that a log book of highly relevant information would
7 be maintained by Georgia Power.

8 A (Witness Johnston) I don't think that I would
9 feel that a log book of it was required, if it's documented
10 through other means, and that may be several different
11 methods.

12 BOARD EXAMINATION

13 BY CHAIRMAN BLOCH:

14 Q Mr. Johnson, while you were on site, did you
15 keep a log of all the troubleshooting starts?

16 A (Witness Johnston) Which would identify the
17 actual starts of the equipment? That's a question.

18 Q Yes.

19 A (Witness Johnston) No.

20 Q And did you know of any systematic way that was
21 being implemented to keep track of the entire
22 troubleshooting program?

23 A (Witness Johnston) I'm not directly aware of
24 it, no.

25 Q Do you know if any of the personnel involved in

1 the troubleshooting program was keeping a log so that there
2 would be a consistent source of data?

3 A (Witness Owyong) There were several people on
4 site that were making notes. One was Ken Stokes.

5 Q He was keeping regular track of all the
6 troubleshooting starts?

7 A (Witness Owyong) I've seen him, you know, in
8 a notebook making notes of the action. Again, I'm not sure
9 if he was the official log keeper of the actions.

10 Q Was Mr. Burr also keeping a log?

11 A (Witness Johnston) Keeping notes. Again, the
12 difference between log and notes, I'm not certain.

13 Q The only difference in my mind is that it might
14 have the times of the different events and some
15 identification of what happened during the different
16 troubleshooting events.

17 A (Witness Owyong) I don't know if Ken Burr was
18 keeping notes or not.

19 A (Witness Johnston) I just don't know the
20 answer to that.

21 Q You think Mr. Stokes was keeping such a log or
22 such a book?

23 A (Witness Owyong) I remember seeing him write
24 notes down there in a book or notepad.

25

CROSS EXAMINATION

1 BY MR. MICHAEL KOHN:

2 Q And was he routinely doing that function
3 following the site area emergency?

4 A (Witness Owyong) I don't know, I didn't pay
5 attention, you know, to exactly what he was doing. I just
6 happen to remember seeing him taking some notes at times.

7 Q And I mean, do you recall him carrying the
8 notepad around -- in other words, do you have a
9 recollection today of seeing him on more than one occasion
10 with that notebook in his possession making entries?

11 A (Witness Johnston) I don't remember Mr.
12 Stokes' note taking to be any different than the notes that
13 I took in this exhibit. I don't know if what he was
14 recording --

15 Q Excuse me, by "this exhibit," could you
16 identify the exhibit?

17 A (Witness Johnston) I'm sorry. These were my
18 personal outage notes which you had presented to me as II-
19 223. And these are personal notes to myself. I don't know
20 if Mr. Stokes was designated as the official recordkeeper
21 of the troubleshooting event, I simply don't have direct
22 knowledge of that.

23 BOARD EXAMINATION

24 BY CHAIRMAN BLOCH:

25 Q Mr. Owyong, I notice that on April 2, at the

1 IIT meeting, you seemed pretty knowledgeable of how many
2 starts had occurred during the troubleshooting phase, is
3 that correct?

4 A (Witness Owyong) I think I made a comment
5 saying that there were four to five starts.

6 Q Were you pretty confident that you were on top
7 of how many starts were being made during this phase of the
8 work?

9 A (Witness Owyong) What do you mean by
10 confident?

11 Q Well, would you think there'd be much error in
12 the statement you made about four or five starts?

13 A (Witness Johnston) Quite honestly, first off -
14 -

15 Q Wait, let me get Mr. Owyong on this one first.

16 A (Witness Owyong) No, I would not say that
17 there were four or five starts, no.

18 Q So there could have been more?

19 A (Witness Owyong) There could have been more,
20 there could have --

21 Q Could have been less?

22 A (Witness Owyong) I kind of doubt if there was
23 less because once we found certain problems or during the
24 troubleshooting we actually started the engine, and as far
25 as how many times, I wasn't keeping track, I was more

1 concerned of what data we were getting.

2 Q Now Mr. Stokes also gave a number. Do you have
3 any awareness of whether or not he was keeping pretty
4 accurate count of what was happening?

5 A (Witness Owyong) No, I'm not aware.

6 Q Mr. Johnston, you wanted to comment. Please
7 do.

8 A (Witness Johnston) Yes, I was just going to
9 say in general during the days that followed the March 20
10 event, Sheldon and I worked together as a team, we attended
11 so many meetings, there was so much activity going on in
12 various areas of the plant, that you know, we only spent a
13 fraction of our time physically in the engine room, so we
14 wouldn't have experience of everything that took place in
15 that engine. Plus, because we worked together as a team,
16 we worked -- while it wasn't exactly a shift, but you know,
17 we usually arrived in the morning, would stay until hours
18 in the evening, but once we left, neither of us knew what
19 took place during the night.

20 Q And so there was no provision when you came in
21 the next day to be filled in on what had happened?

22 A (Witness Johnston) Only in the continued
23 attendance at meetings and the briefings that were
24 presented and discussions that we may have had with Burr
25 and Stokes and everyone else that we interfaced with.

1 Q Well, did that mean that you were completely
2 informed, or what did the "only" mean?

3 A (Witness Johnston) It doesn't mean that there
4 was an official turnover to us to describe all events that
5 took place. If people felt that something that was done or
6 discovered during the night was of important to us and
7 wanted to comment on it, wanted our comments to it, they
8 would tell us. But there was no need for us to know
9 everything.

10 Q Were you provided, in your opinion, just
11 selective information?

12 A (Witness Owyong) No, as far as I was
13 concerned, whatever questions that we asked we received
14 information. So it wasn't selective on based of you would
15 say a "need to know" basis.

16 Q Well, when you got back on the site after you
17 had left -- well, let me rephrase it.

18 At a point in time where you -- you were not
19 aware of what activity occurred on the diesel in your
20 absence, did you ask what occurred, to keep yourself up to
21 speed as to where you really were on a time line events of
22 everything that taken place on the diesel (sic)?

23 A (Witness Johnston) For the most part I'd say
24 that statement's true.

25 A (Witness Owyong) Yes.

1 A (Witness Johnston) There may be exceptions to
2 it, and that goes back to there not being a formal
3 turnover. It's -- you know, when -- when the direction of
4 troubleshooting was focused at some other event within the
5 diesel room...and this is an extreme example...but if some
6 event in the diesel room had to do with a fuel transfer
7 pump, we may not have been advised of it.

8 Q Do you think professionalism would require some
9 form of formal turnover procedures to adequately make sure
10 that one person at least was on top of everything, every
11 detail?

12 A (Witness Johnston) The only reason I hesitate
13 on that is I -- in remembering the magnitude of the event
14 and the number of people involved, I just wonder if it's
15 capable that one person could be on top of every event that
16 -- of every detail that took place over that period of
17 time.

18 Q Then maybe the question was poorly phrased. I
19 meant to say not necessarily one person, but one system
20 management responsible for tracking every detail learned
21 from all the participants.

22 CHAIRMAN BLOCH: With respect to the
23 troubleshooting program, right?

24 MR. MICHAEL KOHN: Yes.

25 BY WITNESS OWYOUNG:

1 A (Witness Owyong) No.

2 CROSS EXAMINATION (Continued)

3 BY MR. MICHAEL KOHN:

4 Q Did other people inform him of the starts that
5 you participated in?

6 A (Witness Johnston) To the best of my
7 knowledge, yes.

8 Q I'm going to, Mr. Johnston, ask you to look at
9 your... Mr. Johnston, I'm going to ask you to look at your
10 logbook I believe that you have in front of you.

11 A (Witness Johnston) Personal notes? That's
12 really a question, because we have one exhibit that was the
13 -- the outage logbook; right now I have my personal notes
14 for the outage.

15 Q 223, which is your personal outage notes, if
16 you could find the March 29 entry. And in the middle of
17 the page it's a Thursday, 3/29/90, "Sheldon meets with
18 NRC."

19 A (Witness Johnston) That's correct.

20 Q Okay. And then there's a discussion, and then
21 at the bottom it says, on the right-hand side, "Ten hours,"
22 underlined.

23 A (Witness Johnston) That's correct.

24 Q That's how many hours you worked on 3/29/90?

25 A (Witness Johnston) That's correct.

1 Q And do you remember, you normally started in
2 the morning?

3 A (Witness Johnston) At this period in the
4 investigation we may have started at any time. It would be
5 probable, seeing that the -- the prior day was only a six
6 hour day, it was probable that we were in there in the
7 morning.

8 Q Okay. And then the next page there's an entry
9 on Friday, 3/30/90, and you indicate on the top that you
10 didn't do anything until Mr. -- Sheldon got out of NRC
11 meeting?

12 A (Witness Johnston) Thank you for cleaning up
13 the entry. Yes, that's correct.

14 Q Okay. And so...

15 MR. MICHAEL KOHN: I have no further questions.

16 CHAIRMAN BLOCH: All right, we'll take that ten
17 minute break now. Staff will commence after the break.

18 (A short recess was taken.)

19 CHAIRMAN BLOCH: Ms. Young?

20 CROSS EXAMINATION

21 BY MS. YOUNG:

22 Q Good afternoon, gentlemen.

23 A (Witness Johnston) Good afternoon.

24 A (Witness Owyong) Good afternoon.

25 Q You testified earlier this morning about the

1 design of the filter that would trap, through I think
2 cyclonic process, moisture out of the air in air start
3 lines, I believe?

4 A (Witness Owyong) Yes.

5 Q Do you recall that?

6 A (Witness Owyong) Yes.

7 Q Could you tell us how large that bowl is? And
8 I'm thinking of what quantity of moisture or water would it
9 hold?

10 A (Witness Owyong) About four...

11 A (Witness Johnston) Do you have a diagram of
12 the bowl?

13 Q I think there's one in GPC II-87.

14 MR. MICHAEL KOHN: Mitzi, do you mean control
15 air?

16 MS. YOUNG: Yes.

17 MR. MICHAEL KOHN: Okay, I think you said air
18 start.

19 MS. YOUNG: I'm sorry.

20 WITNESS JOHNSTON: About two and a half in
21 diameter by -- the whole assembly is maybe ten inches.

22 WITNESS OWYONG: But the bowl itself,
23 though...

24 CHAIRMAN BLOCH: Let the record show the
25 diagram has been furnished to the witnesses. Is there an

1 exhibit number on the diagram?

2 MR. MICHAEL KOHN: Not on that copy.

3 MR. BLAKE: Ms. Young was correct, it is GPC

4 Exhibit II-87.

5 WITNESS JOHNSTON: Are you looking at this same
6 document?

7 MS. YOUNG: Yes.

8 BY WITNESS JOHNSON:

9 A Okay, the diameter of the bowl is approximately
10 three inches. They show the housing to be 3.14 inch, but
11 the bowl is slightly less than that. Then the -- we use
12 the manual drain. It shows, including the drain valve, it
13 to be 6.69 inches. I would estimate the bowl to be
14 approximately five and a half inches of that.

15 Q So about how much liquid could that bowl hold?
16 I'm asking because questions came up this morning about
17 whether -- if the bowl filled and water could be pushed
18 downstream.

19 A (Witness Johnston) Guesstimating the capacity
20 on it...and this is purely a guesstimate...to fill that
21 bowl we're looking at probably six to eight ounces.

22 Q Now, Mr. Owyong, I believe you stated that
23 there was a potential that moisture collected in the bowl
24 could evaporate.

25 A (Witness Owyong) Over a period of time.

1 Q When it evaporated where would it go?

2 A (Witness Owyong) It could possibly go through
3 the system, through the filter.

4 Q Is there any way for it to get out of the
5 system if it's not physically drained?

6 A (Witness Owyong) The water?

7 Q Yes.

8 A (Witness Owyong) No.

9 Q And how often are the filter bowls drained?

10 A (Witness Johnston) We're required to replace
11 that filter element on an end-of-cycle basis, so it would
12 be 18 months.

13 CHAIRMAN BLOCH: You say you're required;
14 there's a procedure at the plant that requires that?

15 WITNESS JOHNSTON: That's correct.

16 WITNESS OWYOUNG: Yes.

17 BY MS. YOUNG:

18 Q Do you know whether there are any periods
19 between outages that that filter might be drained by GPC
20 employees?

21 A (Witness Johnston) Don't know.

22 A (Witness Owyong) I don't know.

23 Q You indicated in your testimony earlier today
24 that the air dryers or air compressors were not safety
25 related. Do you recall those statements?

1 A (Witness Owyong) Yes.

2 Q Would you explain why they're not safety
3 related.

4 A (Witness Owyong) That's based on our
5 evaluation of the system, and it's based on the engine
6 running for seven days. If the air dryer fails, could it
7 cause the engine to shut down during a seven-day run
8 period. And if it doesn't, then we declare that non-safety
9 related.

10 A (Witness Johnston) The system -- if you look
11 at a system schematic, looking at all the major components,
12 which would include the compressors, the air dryers,
13 receivers, piping and the engine, the ASME Section 3
14 boundary for the components stopped at a check valve at the
15 receiver, so the air compressors and the air dryers were
16 not provided under -- as Section 3 components. In
17 evaluating safety related, for the purposes of a dedication
18 program, we also applied the safety related boundary at
19 that check valve.

20 Q Now, when you say "safety related," are you
21 referring to the same thing as Q-class components?

22 A (Witness Johnston) No, this is purely for the
23 parts dedication program for supply and replacement parts.

24 Q Could you identify for us what portions, if
25 any, of the 250 pound portion of the diesel air system is

1 safety related?

2 A (Witness Johnston) Everything from the check
3 valve on the inlet side of the receiver onto the engine was
4 safety related. That includes the block and vent valves.

5 BOARD EXAMINATION

6 BY CHAIRMAN BLOCH:

7 Q Could you explain what this replacement parts
8 program is.

9 A (Witness Johnston) That's under the guidelines
10 of EPRI. I don't -- I don't know the numbers to cite, but
11 under the guidelines of EPRI dedication of commercial grade
12 items for nuclear service, when we get a purchase order to
13 -- to furnish a replacement part to a customer we do an
14 evaluation of that component for its impact on operation of
15 the equipment. And then that could be designated as safety
16 related or commercial grade.

17 Q And does that affect, what, the price that's
18 paid for the replacement or what?

19 A (Witness Johnston) It has a dramatic affect on
20 price.

21 Q It's free?

22 A (Witness Johnston) It also has a -- pardon?

23 Q It's free if it's a safety grade...?

24 A (Witness Johnston) No, no, no, sir.

25 Q Oh.

1 A (Witness Johnston) But there's... You haven't
2 purchased from Cooper.

3 A (Witness Owyong) No, if -- if a component is
4 designated as a -- as a safety related component then there
5 are critical characteristics that are given to that
6 particular component, and so it goes to a more extensive
7 inspection before it's delivered. So, in other words, it
8 is more expensive.

9 CHAIRMAN BLOCH: I'm happy I asked, even though
10 it provoked a lot of laughter at me.

11 MR. BLAKE: It was with you, Judge.

12 CHAIRMAN BLOCH: No, it wasn't.

13 CROSS EXAMINATION (Continued)

14 BY MS. YOUNG:

15 Q Can you also identify what portions of the 60
16 pound segment of the diesel air system is safety related?

17 A (Witness Owyong) Of course, the -- the filter
18 is safety related. I -- and again, just is going by
19 memory, I -- I think the shutdown sensors are safety
20 related, and I think the logic board is safety related,
21 also.

22 Q Do you know whether or not the NRC agrees with
23 your definitions?

24 A (Witness Owyong) That I don't know.

25 A (Witness Johnston) Our -- we've been audited

1 on several occasions for our safety related program, and I
2 don't recall any audit findings that disagreed with our --
3 with our classifications.

4 A (Witness Owyong) And that was audit by -- by
5 the NRC.

6 A (Witness Johnston) That's correct. I'm sorry.

7 Q I think you indicated, in response to a
8 question by Mr. Kohn, that if a line was blocked to a
9 cylinder on a diesel, that the diesel generator would fail
10 to start. Do you recall that statement?

11 A (Witness Johnston) I think that was when I was
12 in a -- in something of a state of confusion as to whether
13 the question pertained to -- let me clarify this. Are we
14 talking about to the starting air valves?

15 Q Yes.

16 A (Witness Johnston) That's what I thought. I
17 think I was confused at the time that I was responding to
18 that as to whether he was referring to one or all of them.

19 Q Yes.

20 A (Witness Johnston) If he was referring to one
21 of them, it is very likely that that failure would go
22 undetected; if it's all of them, it's very possible that we
23 could see a fail to start.

24 Q So when you say...

25 CHAIRMAN BLOCH: And I think you also said you

1 weren't sure, by analysis, of whether it would be one, two,
2 or three that would cause a problem.

3 WITNESS JOHNSTON: That's correct.

4 WITNESS OWYOUNG: That's correct.

5 BY MS. YOUNG:

6 Q So when you say "fail to be detected," you mean
7 fail to affect the performance of the engine?

8 A (Witness Johnston) That's correct. As stated
9 in our Part 21, a failure of a single valve to open would
10 probably go undetected. That's because more than one valve
11 will actuate at a given position of the crank shaft, with a
12 given stationary position of the crank shaft. So if one of
13 the valves fail to open, the second one would get the crank
14 shaft moving, and by the time it came around for that first
15 one to open again, the crank shaft would have sufficient
16 momentum to get past that valve.

17 Q Like you to turn to Intervenor's Exhibit II-
18 222. That's the Cooper outage logbook.

19 A (Witness Johnston) Okay.

20 Q Turn to the last page of that document.

21 A (Witness Johnston) Yes.

22 Q There's an entry by Mr. Block.

23 A (Witness Johnston) Yes.

24 Q No relation, I suppose, to our illustrious
25 chairman.

1 I'm looking at Item 3 which says, "Service
2 moisture traps."

3 A (Witness Johnston) Yes.

4 Q Is that correct? Could you tell us what
5 moisture traps are and where they're located.

6 A (Witness Johnston) Yes, these are moisture
7 traps which are located within the air dryers. I believe
8 these to be automatic drain type moisture traps. Again,
9 this is a requirement of the DRQR matrix which we talked
10 about earlier. It says that on an end-of-cycle basis you
11 will service these by replacing all the elastomers, and I
12 believe the valve is changed in it. There is a repair kit
13 and this valve is disassembled, inspected, and the repair
14 kit elements put into it, then it's reinstalled.

15 Q Do Cooper employees do these activities?

16 A (Witness Johnston) It's generally within our
17 scope if we're doing a turnkey outage. On occasion Georgia
18 Power personnel may have assisted us by doing this, but
19 this entry by Lance Block indicates that we were performing
20 it at that time.

21 Q Are there any records at the plant of this
22 being done?

23 A (Witness Johnston) Yes, that would be
24 contained in the MWO.

25 Q Like you to turn to Exhibit II-223.

1 WITNESS JOHNSTON: Mr. Kohn, can you help us
2 with that, please.

3 MS. YOUNG: It's -- Mr. Johnston, it's your
4 personal outage notes.

5 WITNESS JOHNSTON: Yes.

6 BY MS. YOUNG:

7 Q Turn to about 13 pages from the end of the
8 document. There's an entry on 3/19/90.

9 A (Witness Johnston) What was the date, please?

10 Q March 19th.

11 A (Witness Johnston) Yes.

12 Q Okay, this was taken during some
13 troubleshooting activities on the logic board.

14 A (Witness Johnston) Yes.

15 Q One of the last sentences on the page talks
16 about, "Revolved -- resolved logic problem with Owyong.
17 Find garbage in an..." Can you help us?

18 A (Witness Johnston) OR element.

19 Q OR?

20 A (Witness Johnston) Yes.

21 Q What does that stand for?

22 A (Witness Johnston) Just OR. It's -- it's a
23 logic term. You have AND elements, OR elements, NOT.

24 Q Could you identify what this garbage was or
25 where it might have come from?

1 grit, again being on the order of a 16th to a 32nd of an
2 inch in diameter.

3 Q Well, I notice one of you described it as
4 metallic and the other one as grit, and it could have been
5 something off of a threading, couldn't it?

6 A (Witness Johnston) It didn't appear...

7 A (Witness Owyong) It -- excuse me.

8 A (Witness Johnston) It didn't appear to be, and
9 a technical term was applied to it in the analysis of Wyle
10 Labs, I believe. But it didn't appear to be a spawled or a
11 stripped thread. It was more rounded than I would expect
12 to see from -- from thread damage.

13 Q Do you know whether anyone tried to find out
14 what the root cause of that was?

15 A (Witness Johnston) I don't know.

16 A (Witness Owyong) My recollection is that we
17 put it -- we put that piece of grit, whatever you want to
18 call it, in a paper -- in a plastic bag and I think we gave
19 it to Ken Stokes.

20 A (Witness Johnston) Either that or it may have
21 been attached to the MWO, I just don't recall.

22 A (Witness Owyong) Yeah, one or the other.

23 A (Witness Johnston) You do understand this --
24 this log entry pertains to the B train diesel generator.

25 CROSS EXAMINATION (Continued)

1 BY MS. YOUNG:

2 Q Which was out for overhaul during this time
3 period?

4 A (Witness Johnston) Yes, we were still working
5 on B train on the March -- on March 19th.

6 Q In that same exhibit, about five pages past
7 that one there's an entry for March 27th, '90.

8 A (Witness Johnston) Yes.

9 Q And it indicates I&C was having problems
10 calibrating a sensor during the night.

11 A (Witness Johnston) Yes.

12 Q Okay, if you turn to the next page, about the
13 second to last sentence on the page is, "Direct emersion is
14 acceptable."

15 A (Witness Johnston) Yes.

16 Q Could you explain the purpose of that
17 instruction or observation. And I assume this is about
18 Calcon sensors, is that correct?

19 A (Witness Johnston) Yes, that's correct. If
20 you can give me just a moment.

21 (The witness reviews certain material.)

22 A (Witness Johnston) Quite honestly, I can't
23 identify the purpose of this entry. Obviously it's not a
24 procedure that was applied -- was provided to the customer.
25 I think discussions were held with I&C personnel and that

1 these points were discussed and then I just summarized them
2 in my entry here. The statement with reference to direct
3 immersion -- was Gary on site at that time? March 27.

4 A (Witness Owyong) Could have been.

5 CHAIRMAN BLOCH: Mr. Owyong remarked "could
6 have been."

7 A (Witness Owyong) Yes, he could have been --
8 excuse me.

9 A (Witness Johnston) The statement with respect
10 to "direct immersion is acceptable" indicates that at that
11 time we believed that there was no problem putting the
12 thermal elements of the temperature detector directly into
13 the immersion bath as opposed to putting it into the
14 thermal well. Now after the work that was done at Wyle, I
15 certainly would retract that statement.

16 BOARD EXAMINATION

17 BY CHAIRMAN BLOCH:

18 Q Can you tell from the note whether you told
19 people at Vogtle that it was acceptable to immerse it
20 without putting it in the well?

21 A (Witness Johnston) I can't tell from this
22 note.

23 FURTHER CROSS EXAMINATION (Continued)

24 BY MS. YOUNG:

25 Q I may not have heard your direct answer. Does

1 direct immersion of a Calcon device in a water bath affect
2 the calibration?

3 A (Witness Johnston) Again, now having the
4 knowledge of the Wyle report, my answer is no, it is not
5 acceptable.

6 BOARD EXAMINATION

7 BY CHAIRMAN BLOCH:

8 Q You mentioned that Gary might have been on
9 site. That's the gentleman from Calcon?

10 A (Witness Johnston) That's correct.

11 A (Witness Owyong) That's correct.

12 Q His name is?

13 A (Witness Owyong) Gary Hazelitt.

14 Q Gary Hazelitt. And could this have been your
15 recording of a remark that he made?

16 A (Witness Johnston) I simply don't remember. I
17 don't know if he came out that early. I simply don't
18 remember.

19 Q We have testimony on our record that the
20 calibration procedures were developed after being observed
21 by representatives from Calcon. Do you know whether or not
22 that's true?

23 A (Witness Owyong) That I don't know.

24 A (Witness Johnston) I believe -- it's my

25 understanding that the existing calibration procedures are

1 a product of the failure analysis and findings of Wyle,
2 input from Cooper personnel and input from Gary Hazelitt.

3 Q Okay, but the question is what the procedures
4 in existence in April and May of 1990 were the result of.
5 Do you know whether or not Mr. Hazelitt had input into that
6 at that time?

7 A (Witness Johnston) I don't know. I don't know
8 if those procedures in April and May of '90 were revised
9 from the procedures used prior to March 20th. I don't know
10 when revisions occurred to those procedures.

11 Q Well, are you aware that there was a second
12 Wyle report in May of 1990?

13 A (Witness Johnston) No, I'm not aware of that.

14 FURTHER CROSS EXAMINATION (Continued)

15 BY MS. YOUNG:

16 Q On the topic of procedures for calibrations, do
17 you both recall participating in an April 2, 1990 meeting
18 with the IIT?

19 A (Witness Johnston) I do.

20 Q Mr. Owyong?

21 A (Witness Johnston) That was the day before we
22 left site.

23 A (Witness Owyong) Yes.

24 Q I'd like to show you -- well, let me ask you
25 this question. In preparing your testimony, did you review

1 any transcripts of meetings with the IIT?

2 A (Witness Johnston) Yes.

3 A (Witness Owyong) Yes.

4 Q Do you know which ones, because I don't believe
5 you identified them previously.

6 A (Witness Johnston) I reviewed the transcript
7 of the April 2 meeting, which was attended by 30 people.
8 There was also a transcript of a meeting between Sheldon
9 and Mr. Kendall, a member of the IIT, that I reviewed that
10 occurred a couple of days prior to the April 2 meeting.

11 Q Do you any chance have a copy of that
12 transcript with you?

13 A (Witness Johnston) Not with me.

14 MS. YOUNG: Does counsel for Georgia Power have
15 that transcript?

16 MR. BLAKE: I'm not certain which transcript
17 he's referring to.

18 MS. YOUNG: He says a couple of days, he
19 believes, before the April 2 meeting.

20 MR. BLAKE: I just don't know which one he's
21 referring to. We may have it, I just don't know.

22 BY MS. YOUNG:

23 Q Well, let me ask the witnesses, were you
24 provided these transcripts by counsel for Georgia Power?

25 A (Witness Owyong) Yes.

1 A (Witness Johnston) Mr. Lamberski --

2 MS. YOUNG: So perhaps we need to ask him.

3 MR. BLAKE: Okay.

4 CHAIRMAN BLOCH: We can note for the record
5 that he's not sitting here at this moment.

6 BY MS. YOUNG:

7 Q I'd like to show you a copy of the April 2
8 transcript, which has been marked on our record as Bockhold
9 M, GPC II-77.

10 (A document was proffered to the witness.)

11 Q If you could turn to page 33. There's a
12 statement at the bottom of the page by Mr. Owyong that the
13 utility is using a generic calibration procedure. It's
14 about line 22.

15 (The witness reviews the document.)

16 A (Witness Owyong) Yes, I see it.

17 Q Is that the same thing that you were talking
18 about this morning, I believe in response to Judge
19 Carpenter about the completeness of the procedure for
20 calibrating Calcon sensors? You mentioned it was a generic
21 procedure.

22 A (Witness Owyong) Yes.

23 Q It could be used for electrical or pneumatic
24 devices.

25 A (Witness Owyong) No, it's a generic procedure

1 stating how to -- if my memory serves me correct, how to
2 calibrate a sensor, a pneumatic sensor, but not necessarily
3 to set a particular set point. So I deemed that as a
4 generic procedure.

5 CHAIRMAN BLOCH: What was the three letters --

6 MS. YOUNG: RER.

7 CHAIRMAN BLOCH: Do you know if it was an RER,
8 a request for an engineering response?

9 BY MS. YOUNG:

10 Q That as being used during sensor calibration.
11 Do you recall technicians using additional documents
12 besides that procedure?

13 A (Witness Owyong) No, I don't.

14 Q But you did observe calibrations of Calcon
15 sensors?

16 A (Witness Owyong) I observed some.

17 Q And Mr. Johnston, I believe you stated earlier
18 that you did too?

19 A (Witness Johnston) Yes.

20 BOARD EXAMINATION

21 BY CHAIRMAN BLOCH:

22 Q Did you ever notice that calibration was being
23 done using a procedure which was designed for an electrical
24 switch?

25 A (Witness Johnston) I don't remember seeing

1 that.

2 A (Witness Owyong) I don't either.

3 Q You probably would have noticed that?

4 A (Witness Johnston) I think so.

5 A (Witness Owyong) Yes, I would think so.

6 BY ADMINISTRATIVE JUDGE CARPENTER:

7 Q But I believe your testimony was that you never
8 looked at the procedure document, you never read it.

9 A (Witness Owyong) That's correct.

10 Q Out of idle curiosity, these -- witnesses we've
11 had all like to refer to these Calcon devices as switches.

12 A (Witness Johnston) Yes.

13 Q And I read the Calcon literature and I examine
14 only the temperature sensor, and I don't see any bistable
15 aspects to it. The literature --

16 A (Witness Johnston) It's not --

17 Q The literature calls it a transducer. Are you
18 more comfortable with the word "transducer" or the word
19 "switch" as being an accurate description of the
20 temperature sensor?

21 A (Witness Owyong) The accurate description for
22 the temperature sensor would be a pneumatic two-way valve.

23 A (Witness Johnston) Switch is not an
24 appropriate term if you're taking it literally for that
25 device because it will begin to vent slowly near the set

1 point and then it does -- as you say, it's not bistable,
2 but the rate at which it vents is not linear either.

3 Q Exactly.

4 A (Witness Johnston) Right.

5 Q It is a very non-linear temperature sensor.

6 A (Witness Owyong) That's correct.

7 A (Witness Johnston) Right.

8 Q In terms of the signal it provides through the
9 pressure decrease.

10 A (Witness Johnston) Right.

11 A (Witness Owyong) That's correct.

12 Q But you see, these people, by casually calling
13 this thing a temperature switch, then pull this so-called
14 generic temperature switch calibration procedure out of the
15 file and it tells the technician, first of all, remove the
16 electrical leads. Can you imagine that's the document that
17 was being used in the calibration lab when you were there?

18 A (Witness Owyong) I doubt it.

19 Q You do?

20 A (Witness Owyong) Yes.

21 Q Well, Mr. Briney says that's what they were
22 using.

23 A (Witness Johnston) Something else had to be
24 used, because the technicians did know that an orifice was
25 required and pressure gauges were required, and those would

1 not be used with an electrical temperature switch.

2 Q Right.

3 A (Witness Owyong) And --

4 A (Witness Johnston) So, while I can't dispute
5 that their work order had documents relative to electric
6 switches, they must have also had something else to work
7 with.

8 A (Witness Owyong) And like I said, that I
9 observed one technician using the wrong size orifice and
10 when I proceeded to tell him that it was the wrong size
11 orifice, he told me that it was stated in his procedure to
12 use that size orifice.

13 Q But he was aware that an orifice was needed.

14 A (Witness Owyong) That is correct.

15 ADMINISTRATIVE JUDGE CARPENTER: Thank you.

16 FURTHER CROSS EXAMINATION (Continued)

17 BY MS. YOUNG:

18 Q Mr. Owyong, were you referring to a statement
19 that's recorded on Mr. Johnston's May 11, 1990 memo, which
20 has been marked as Intervenor 216, on page 3?

21 A (Witness Johnston) Again, which document are
22 we looking at?

23 Q Intervenor II-216.

24 A (Witness Johnston) And which page are we
25 looking at now?

1 Q Three.

2 A (Witness Johnston) And what date?

3 Q 3/26/90 entry.

4 A (Witness Owyong) What's the question?

5 Q When you indicated to Judge Carpenter that you
6 told someone -- a technician they were using the wrong size
7 orifice and they told you that their procedure called for
8 that orifice -- is this the same event that's recorded in
9 this entry?

10 A (Witness Owyong) I don't know exactly what
11 date it was.

12 Q But you do acknowledge that there is an
13 observation here --

14 A (Witness Owyong) Yes.

15 Q -- that technicians were having problems using
16 the correct orifice size?

17 A (Witness Owyong) Yes.

18 CHAIRMAN BLOCH: Did it happen twice?

19 WITNESS OWYOUNG: I wasn't aware that it
20 happened twice.

21 BY MS. YOUNG:

22 Q Well, Mr. Johnston, was this based on your
23 observation or Mr. Owyong's observation, the entry at
24 3/26?

25 A (Witness Johnston) This whole memo is based on

1 my observations.

2 Q So it was you who indicated to a technician
3 that they were using the wrong size orifice?

4 A (Witness Johnston) And allow me to correct my
5 statement. This whole memo was based on, if not my direct
6 observations, then my understanding of discussions from
7 other people. So I may not have observed this directly but
8 on this particular event, I do believe that this refers to
9 the observation by Sheldon and myself that they were not
10 using the orifice size that we recommended.

11 Q And did you observe them doing calibrations at
12 two different times, or were you always together in those
13 observations?

14 A (Witness Owyong) We could have.

15 Q I'm just following up on the Judge's question
16 whether there was more than one instance where the wrong
17 size orifice was used.

18 A (Witness Owyong) My recollection is that,
19 again, when I saw this particular situation, that I went up
20 to Ken Stokes and mentioned it to him and he immediately
21 went down and corrected the problem. So as far as I was
22 concerned, it was a dead issue.

23 Q Do you know whether Mr. Bockhold was informed
24 about any problem with technicians?

25 A (Witness Owyong) That I'm not aware of.

1 Q So you don't know whether Mr. Stokes followed
2 up with Mr. Bockhold on this matter?

3 A (Witness Owyong) No, I don't.

4 Q Did you find Mr. Stokes' actions responsive to
5 your concern about the technician?

6 A (Witness Owyong) Yes.

7 Q And when you say that the comments -- or Mr.
8 Johnston wrote that the comments were met with mild
9 indifference, is a further explanation of that that the
10 technician said they were doing things according to
11 procedures?

12 A (Witness Johnston) Yes.

13 A (Witness Owyong) Yes.

14 BOARD EXAMINATION

15 BY CHAIRMAN BLOCH:

16 Q In your opinion, does the .028 orifice
17 represent an error in the procedure?

18 A (Witness Owyong) What it does is changes the
19 characteristic of the trip point, so yes, it could create
20 an error.

21 Q And is that the kind of mistake in a procedure
22 that you think should be corrected under Appendix B of the
23 NRC's regulations?

24 A (Witness Owyong) I don't know what Appendix B
25 is.

1 Q Okay, so since they were meeting this with mild
2 indifference, I take it you didn't think they created any
3 paper to inquire into the cause of this error in the
4 procedure.

5 A (Witness Johnston) No, sir, my statement "mild
6 indifference" refers solely to the attitude I felt
7 expressed by the technician performing the work. I think
8 that when we directed this to Mr. Stokes, my understanding
9 is that he took the appropriate action to resolve the
10 problem.

11 Q My understanding of appropriate action is
12 inquiring into how the mistake was made in the first place
13 also. Do you have any reason to believe that there was an
14 inquiry made into how the procedure was erroneous in the
15 first place?

16 A (Witness Johnston) I don't know.

17 A (Witness Owyong) No, I don't.

18 Q Do you understand the problem of allowing an
19 error to persist without finding out who made it and
20 whether they were making similar errors elsewhere in the
21 plant?

22 A (Witness Johnston) Yes, I do.

23 A (Witness Owyong) Yes.

24 FURTHER CROSS EXAMINATION (Continued)

25 BY MS. YOUNG:

1 Q Now you indicated that you informed Mr. Stokes
2 of this problem with the technician calibration
3 implementation. Do you know whether Mr. Burr was informed?
4 Did you ever discuss this type of topic with him?

5 A (Witness Owyong) I don't remember if I
6 mentioned it to him or not.

7 A (Witness Johnston) I believe we did, but I'm
8 not certain.

9 Q Going back to the April 2, 1990 ITT transcript
10 which is GPC II-77 I believe. If you'd look at page 34,
11 around line 20, Mr. Owyong again mentions that GPC is
12 using a generic calibration procedure. Do you see that?

13 A (Witness Owyong) Yes.

14 Q Do you know whether the procedure they were
15 using was really what you sent them, as you indicated on
16 page 33?

17 A (Witness Owyong) No, I don't.

18 Q And what was your basis for assuming in 1990
19 that they were using the same procedure on both units?

20 A (Witness Owyong) During this interview, I
21 think I just made that particular statement based on the
22 conversations that were in the room itself.

23 Q Can you recollect today whether different
24 procedures were being used on the two units?

25 A (Witness Johnston) I remember reading

1 statements by I believe Mr. Ken Burr, I believe in this
2 same transcript, though I don't recall where, that devices
3 installed as of this meeting on Unit 2 were devices which
4 had been calibrated as a part of the startup versus devices
5 on Unit 1 that were within operations. And I recall that
6 there was a difference between considering the device
7 tripped at 20 pounds falling versus 40 pounds falling. I
8 think the two procedures may have differed to that extent.

9 CHAIRMAN BLOCH: I want to bring the witnesses
10 a document that's GPC Exhibit 154, to see whether you
11 recognize this as the generic procedure.

12 (A document was proffered to the witness.)

13 WITNESS JOHNSTON: This is the procedure for
14 the electrical switch. I believe they were working to a
15 different document. And may I correct, I believe they had
16 an additional document. They may well have had that one as
17 well but I don't recall.

18 BOARD EXAMINATION

19 BY ADMINISTRATIVE JUDGE CARPENTER:

20 Q If we could return to your observations about
21 the different set points or trip points being used in Unit
22 1 and Unit 2, could you offer me a view as to which
23 pressure choice would reduce the occurrence of extraneous
24 or false trips?

25 A (Witness Johnston) Using the higher of the two

1 set points will result in the device actuating at a higher
2 temperature.

3 Q No, I'm talking about spurious actuation.

4 A (Witness Johnston) I don't believe either of
5 those set points is relative to spurious actuation. I
6 think the difference between the two only affects the
7 actual set point of the device.

8 Q If there's debris in the system and the poppet
9 valves are not closing completely, would there be a greater
10 opportunity for spurious trips with a 40 psi set point or a
11 20 psi set point?

12 A (Witness Johnston) I don't believe the
13 presence of debris can induce spurious trips. I believe
14 the presence of debris is sufficient to result in more
15 leading than six-thousandths will ensure a trip.

16 BY CHAIRMAN BLOCK:

17 Q Mr. Owyong, do you agree?

18 A (Witness Owyong) Yes.

19 BY ADMINISTRATIVE JUDGE CARPENTER:

20 Q So in your mind, this is a no-never-mind, which
21 pressure value is chosen? It doesn't have any effect on
22 the functioning of the system.

23 A (Witness Johnston) I believe it has a minor
24 impact on the actual actuation temperature of the device.
25 It will have the effect of shifting that device. By using

1 the 40 pound set point as your criteria for saying when the
2 device is tripped, the device will actually be tripping at
3 a slightly higher temperature than a similar device set at
4 20 pounds falling.

5 ADMINISTRATIVE JUDGE CARPENTER: Thank you.

6 FURTHER CROSS EXAMINATION (Continued)

7 BY MS. YOUNG:

8 Q When you referred to 20 versus 40 pound
9 pressure, is that concern recorded on page 30 of the
10 transcript for the April 2 IIT?

11 (The witness reviews the document.)

12 A (Witness Johnston) Did you say Page 7?

13 Q No, Page 30.

14 CHAIRMAN BLOCH: Which document are we looking
15 at?

16 MS. YOUNG: We're looking at GPC II-77, the
17 April 2nd, 1990 IIT transcript.

18 WITNESS JOHNSTON: Line 12 is -- is the line
19 that I remembered, 12 and 13.

20 BY MS. YOUNG:

21 Q Based on your personal outage notes, either
22 you, Mr. Owyong, alone, or you collectively engaged in
23 discussions with the IIT March 29th, March 30th, and April
24 2nd, based on this IIT transcript. And I'm referring to
25 your notes that have been marked as Exhibit -- Intervenor

1 Exhibit II-223.

2 A (Witness Johnston) Yes.

3 Q Can you tell us how GPC prepared for
4 presentations for the IIT in terms of your involvement with
5 them? Did they give you any instructions on how to
6 disseminate information to the NRC?

7 A (Witness Johnston) No, not that I recall.

8 A (Witness Owyong) No, we weren't given any
9 instructions other than asked to attend the meeting.

10 Q So there were no pre-briefings, for example,
11 before meetings were...

12 A (Witness Johnston) Prior to the...

13 Q ...held with the IIT?

14 A (Witness Johnston) I'm sorry. Prior to the
15 May 2nd...

16 Q April 2nd?

17 A (Witness Johnston) April 2nd, I'm sorry.
18 Prior to the April 2nd meeting, we had a meeting with
19 Mr. George Bockhold on April 1st in which a summary --
20 there was a discussion to summarize the investigation to
21 date, and that was really the only preparation that I
22 remember, and that was simply a statement of all actions
23 that had taken place.

24 Q Did you get any guidance, like, "Don't give the
25 NRC too many details or they'll just ask you more

1 questions"?

2 A (Witness Johnston) Not at all that I remember.

3 A (Witness Owyong) No.

4 Q Did you get any indication that you weren't
5 supposed to be anything but full and complete in your
6 answers and your discussions with the NRC?

7 A (Witness Johnston) No; in fact, I would say it
8 was to the opposite.

9 Q For example?

10 A (Witness Johnston) I would say that we were
11 strongly encouraged to cooperate in any way required.

12 Q Did -- Mr. Owyong, did you often take the lead
13 in discussing some of the technical issues that came up...

14 A (Witness Owyong) No.

15 Q ...with the IIT?

16 A (Witness Owyong) No, not necessarily.

17 Q Who would you say took the lead?

18 A (Witness Owyong) Neither of us, really. It's
19 just depend on (sic) -- on what expertise or who wanted to
20 say -- you know, take the lead at that time.

21 Q And for Georgia Power Company who would you say
22 was the lead individual?

23 A (Witness Owyong) For which...?

24 Q In discussions held with the IIT that you were
25 present for.

1 A (Witness Johnston) I would say George
2 Bockhold. Can I -- can I ask for clarification?

3 Q Certainly.

4 A (Witness Johnston) Before you said for Georgia
5 Power. Were you referring to -- on the meeting of April
6 2nd, did Sheldon take the lead in our discussions?

7 Q Yes.

8 A (Witness Johnston) Yes, he did, because the
9 bulk of the -- the discussions there dealt with the
10 pneumatic logic, and Sheldon was certainly the best versed
11 to -- to respond to those discussions.

12 Q And I assume, Mr. Owyong, you would agree with
13 that?

14 A (Witness Owyong) Yes.

15 BOARD EXAMINATION

16 BY ADMINISTRATIVE JUDGE MURPHY:

17 Q Gentlemen, did you have any discussions with
18 Mr. Mosbaugh during any of your work...

19 A (Witness Johnston) I don't...

20 Q ...on the diesels?

21 A (Witness Johnston) I don't recall.

22 Q During that time?

23 A (Witness Johnston) I know his name appears on
24 the attendance roster of the April 2nd meeting. I just --
25 I don't recall meeting or discussing...

1 Q You don't recall any...

2 A (Witness Johnston) No.

3 Q ...face to face...

4 A (Witness Owyong) No, I don't recall any.

5 Q ...discussions with him?

6 CROSS EXAMINATION (Continued)

7 BY MS. YOUNG:

8 Q Did you gentlemen ever provide Georgia Power
9 with any guidance as to what activities were necessary for
10 troubleshooting on the diesels after the March 20 site area
11 emergency?

12 A (Witness Johnston) Yes.

13 Q Could you just briefly explain in general terms
14 what you -- how you worked with them?

15 A (Witness Johnston) We worked very closely with
16 Mr. Stokes and Mr. Burr, primarily. We also dealt with
17 members of their I&C group and Maintenance Department, and
18 I would say that the inspection plan was a cooperative
19 effort that we had input to. Such items as performing the
20 bubble test were recommended by us.

21 Q Did you have any concept of what point in the
22 troubleshooting program that -- or point after the
23 troubleshooting program that starts of the diesel generator
24 would be confirmatory in nature that the diesels were
25 reliable, and that any problem that had occurred on 3/20

1 had been identified and corrected?

2 A (Witness Johnston) I'm not sure I understand
3 your question.

4 Q Well, in the April 2nd transcript there are
5 numerous discussions about testing that was being done on
6 the machines. The IIT asked questions about how many
7 successful starts did you have after sensor calibration,
8 after UV testing. All those issues are discussed. I'm
9 trying to understand from you if you gave GPC any guidance
10 as to at what point in the testing program GPC could
11 conclude that its diesels were reliable?

12 A (Witness Johnston) We did not provide input
13 into how many successful starts were required to
14 demonstrate that we had definitely resolved the problem.
15 We provided input as to our belief that the problem was
16 resolved, and that whatever test program was necessary to
17 provide assurance of availability was up to them.

18 Q Did you have a view that by the time you left
19 the site on April 3rd that that work had been done?

20 A (Witness Johnston) I don't know. I -- I felt,
21 on April 3rd, that we had identified the problem. As far
22 as declaring the engine operable, I don't know.

23 Q Mr. Owyong, would you agree with that?

24 A (Witness Owyong) Yes, I agree with that.

25 Q Okay. Do you believe that -- well, do you have

1 an opinion today whether any tests done after the
2 operability test per the plant's tech specs would be of the
3 type that would be relied on to determine whether the
4 diesel would perform its function in an emergency?

5 A (Witness Johnston) I'm sorry, I don't
6 understand the question.

7 Q Well, I understand there was troubleshooting,
8 there was logic testing, there was surveillance done, and
9 there was a test done per procedure to determine that the
10 diesels were operable. Do you have any opinion today on
11 whether the testing done after the operability test per the
12 test specs, is that portion of testing what's necessary for
13 a diesel to be determined reliable?

14 A (Witness Johnston) I had the impression, and I
15 guess I still do, that the requirements to demonstrate
16 operability were rather well defined; if not in the tech
17 spec, then in some regulation. But those aren't -- those
18 aren't regulations or requirements that we're familiar
19 with.

20 Q Do you recall, at the time when you were on
21 site, ever hearing the term "comprehensive test program"?

22 A (Witness Owyong) I don't recall.

23 A (Witness Johnston) I don't -- I don't have now
24 -- I don't recall.

25 Q Did you ever use that term during that period?

1 A (Witness Johnston) I don't recall.

2 A (Witness Owyong) I don't recall.

3 Q If I were to say to you a comprehensive test of
4 the controls on the diesels, would you know what that
5 meant?

6 A (Witness Owyong) No.

7 Q Mr. Johnston, you're shaking?

8 A (Witness Johnston) I -- I would have my
9 interpretation of it. I don't know what you would define
10 by it.

11 CHAIRMAN BLOCH: My observation is that
12 Mr. Johnston's head was shaking.

13 BY MS. YOUNG:

14 Q Could you give us your interpretation?

15 A (Witness Johnston) My interpretation of it
16 would be...

17 MR. BLAKE: I have an objection. I don't know
18 how probative this will be in the grand scheme of things,
19 their having played no role in it, their not having any
20 familiarity with it. Their interpretation at this
21 juncture, I don't know that it will be helpful. My
22 objection is whether or not -- not probative.

23 MS. YOUNG: Well, Judge Bloch, I think these
24 are diesel system control experts. They were -- their
25 expertise was relied on during the troubleshooting phase

1 for the diesels. They were involved in discussions with
2 the NRC concerning what efforts would -- should be taken to
3 establish the return of the diesels to service.

4 CHAIRMAN BLOCH: I guess I think the questions
5 that were asked about whether they heard the terms and
6 whether they knew that others understood the terms, those
7 are all probative, of some value. But given that the NRC
8 experts themselves are available to testify, I'm not sure
9 how it helps to ask these people, also.

10 MS. YOUNG: Well, the NRC experts obviously did
11 things in 1990 which may or may not indicate their ability
12 to -- to give the Board a fresh perspective. I think these
13 -- these individuals have shown that they've -- they've
14 been objective in questioning to date.

15 CHAIRMAN BLOCH: I -- I assume there are only
16 one or two more questions.

17 MS. YOUNG: Yes.

18 BY MS. YOUNG:

19 Q Mr. Johnston, do you remember the question?

20 A (Witness Johnston) Could you repeat it,
21 please.

22 Q What would you view as a comprehensive test of
23 the control system on a diesel?

24 A (Witness Johnston) I'd answer that by saying
25 that we helped author the control panel functional test

1 procedure with the intent of it being a comprehensive test
2 of the control system.

3 BOARD EXAMINATION

4 BY CHAIRMAN BLOCH:

5 Q And what was the last test in the program that
6 you helped author?

7 A (Witness Johnston) The last portion of the
8 engine control panel section of that procedure is a leak
9 test of the Group 2 sensors during engine operation. The
10 engine is actually operating with a simulated safety
11 injection signal so that it will not trip, and then we vent
12 off each of the lines, verify enunciator function, and then
13 attach the bubble tester to the a sensor to verify that the
14 lines from the control panel to the sensor, and the sensor,
15 itself, are not leaking. Now, this is the current format
16 of that procedure; that was not the way it was written back
17 in March of '90.

18 Q Was the test that was designed to map the path
19 of temperature in the -- in the jacket water before or
20 after the test you just described, do you know?

21 A (Witness Johnston) I need to be specific here.
22 The -- the procedure prior to March 20th did not include
23 the operational leak detection of lines from the control
24 panel to the sensors. It did not include the safety
25 injection signal simulation and verification of those

1 functions while the engine was operating.

2 Q Okay, so you're talking about things that were
3 added to the work plan for the outage, is that what you're
4 -- you're referring to?

5 A (Witness Johnston) These are things which, as
6 I recall, were added as part of the troubleshooting effort,
7 and then became incorporated in as a revision to the
8 control panel functional test at that time to be performed
9 at every subsequent outage.

10 Q All right, now, it's possible that other tests
11 that were already in the outage plan would be necessary in
12 order to test the adequacy of the control air system, isn't
13 that correct?

14 A (Witness Johnston) Well, if you're referring
15 to tests such as dew point measurements, yes, those are in
16 -- in other documents.

17 CHAIRMAN BLOCH: Ms. Young, if you can clarify
18 this.

19 MR. BLAKE: Would you allow me to ask just one
20 question to attempt to clarify?

21 MS. YOUNG: Certainly.

22 CHAIRMAN BLOCH: Please do. That's fine.

23 MR. BLAKE: Would the -- the test that you were
24 talking of the control system, would it involve starting
25 the diesel at all?

1 WITNESS JOHNSTON: The revisions to that
2 procedure following the March 20th event, including the
3 troubleshooting effort that took place, now involves
4 starting of the engine, yes. It did not prior to March
5 20th.

6 CROSS EXAMINATION (Continued)

7 BY MS. YOUNG:

8 Q Do you recall on April 2nd the NRC being
9 concerned with how many starts there were on the diesels
10 after the UV test? And I'm looking at Page 43 of the
11 transcript of the April 2nd meeting.

12 CHAIRMAN BLOCH: Ms. Young, we're going to look
13 for some -- some response by them, not just to the -- to
14 what the NRC meant in the transcript, right? 'Cause if
15 it's what the NRC meant, I can read it, too.

16 WITNESS JOHNSTON: Could you repeat the
17 question, please.

18 BY MS. YOUNG:

19 Q I'm looking at Page 43, about Line 15.

20 A (Witness Johnston) Yes.

21 Q Mr. Chaffee's question about after finish UV
22 testing were there any other problems encountered in
23 testing. And you see there, there are estimates given on
24 how many starts there were after that point.

25 A (Witness Johnston) Yes.

1 Q At that time in April of 1990 was -- was there
2 any significance in your mind attached to the NRC being
3 concerned with starts after the UV test?

4 A (Witness Johnston) It was not significant to
5 me.

6 A (Witness Owyong) No, not -- nor to me.

7 Q Did you understand how the term "successful
8 start" was being used in those discussions?

9 A (Witness Owyong) I don't remember.

10 A (Witness Johnston) I can imply something from
11 it, but I don't know... I mean, it implies you push the
12 start button, the engine starts.

13 A (Witness Owyong) And it didn't shut down.

14 Q Do you recall having any discussions with GPC
15 employees about what was meant by the term "successful
16 start"?

17 A (Witness Owyong) I don't remember.

18 A (Witness Johnston) I remember discussions
19 about, you know, if a trip was -- was a valid trip or not.
20 That's kind of taking the opposite of what you're asking,
21 but I do recall discussions to that effect.

22 Q Do you remember whether anyone assumed that the
23 diesel had to come up to speed and run for a minute or so
24 to be a successful start?

25 A (Witness Johnston) No, I don't recall.

1 Q Mr. Owyong?

2 A (Witness Owyong) No. No, I don't recall.

3 Q At the time you left the site are you aware of
4 any testing or activities that should have been done on the
5 diesels to confirm that they were operable or reliable?

6 A (Witness Johnston) Again, excluding our lack
7 of knowledge on tech spec requirements and regulatory
8 requirements, I felt satisfied when I left that we had
9 identified the problem and resolved it, and that that
10 engine was -- was operable.

11 A (Witness Owyong) I agree.

12 Q You've had a lot of questions today about
13 diesel generator air quality. Is there some general
14 purpose for an air quality criteria for diesel generators,
15 or is it just a needless term?

16 A (Witness Owyong) Would you ask the question
17 again, please.

18 CHAIRMAN BLOCH: The question is: Is the air
19 quality -- is an air quality standard for the air control
20 system on the diesels just needless?

21 BY MS. YOUNG:

22 Q Or does it serve some purpose?

23 A (Witness Johnston) That could be carried to
24 the extreme. I mean, we can't have rocks and birds in the
25 air receiver. But I don't know, at the other end of the

1 spectrum, if -- if the relatively stringent requirements of
2 the ANSI standard are required for the function of the
3 test, either, so there's a medium in-between at which, you
4 know, the control system functions just fine.

5 Q Well, does air quality -- do air quality
6 standards serve to increase the longevity of the equipment?

7 A (Witness Owyong) Definitely.

8 A (Witness Johnston) Yes.

9 Q And does it also serve to decrease the amount
10 of maintenance that has to be performed on the diesel
11 generator?

12 A (Witness Owyong) To a certain extent, yes.

13 Q Why do you express a reservation?

14 A (Witness Owyong) Because even with the higher
15 quality of air you still have aging of your elastomers, so
16 you still have to recondition particular components,
17 regardless of the quality of air.

18 Q Now, when you were on site in March and April
19 of 1990 were you aware of any rust or corrosion being found
20 in diesel generator components?

21 A (Witness Owyong) No, I was not.

22 A (Witness Johnston) No, I wasn't -- while we
23 were there in March of '90, no, I was not aware of any.

24 Q Did you observe any rust or corrosion in the
25 air emission valves?

1 A (Witness Johnston) No, I did not.

2 Q And what about in July of '90?

3 A (Witness Johnston) No. I assumed that to be
4 the time frame. I did not.

5 BOARD EXAMINATION

6 BY ADMINISTRATIVE JUDGE CARPENTER:

7 Q Were the caps removed in your presence?

8 A (Witness Johnston) The caps which we had
9 identified as failing the pop test that we developed on the
10 day that I arrived were removed in my presence, and I
11 examined them directly as they came out of the engine. In
12 fact, I believe that I may have removed some of them
13 myself. I did not observe all of the caps from that 2-A
14 engine. After we had identified what I believed to be the
15 problem and came up with a remedy for it, I went back to
16 the hotel and left it up to the Maintenance Department to
17 complete the balance of the -- the starting air valves.

18 Q Well, when you observed them did you observe
19 any oxidation, rust, what have you, corrosion?

20 A (Witness Johnston) No. When I looked at those
21 components, again the piston is stainless steel and it
22 appeared to be in good condition. In fact, they appeared
23 to be in "as new" condition. The caps are a iron casting
24 with both internal and external surfaces Parko Lubrited.
25 That gives a -- a dark gray, flat matte appearance to the

1 surface of the -- of the casting, and that surface was
2 intact and undisturbed over all the surfaces, as I recall.

3 Q Even though there was binding, there was no
4 disturbance of the surface?

5 A (Witness Johnston) That's my recollection.
6 The forces applied to the piston are relatively small.

7 Q Is this coating a relatively firm (sic)?

8 A (Witness Johnston) It's a tough coating. I
9 would describe it as being a very tough coating.

10 Q So you think it's not easily abraded?

11 A (Witness Johnston) That's correct.

12 Q Thank you.

13 CROSS EXAMINATION (Continued)

14 BY MS. YOUNG:

15 Q Like you to turn to Page -- the bottom of 13
16 and the top -- excuse me, bottom of 12 and the top of 13 of
17 your testimony. In those pages of your testimony you refer
18 to the unlikelihood that Mr. Mosbaugh is correct that
19 moisture could affect the operation of the diesels, is that
20 correct?

21 A (Witness Johnston) I intended to say that it's
22 unlikely that moisture caused corrosion of these
23 components, because the components are designed to tolerate
24 moisture and be resistant to corrosion.

25 Q Did you have any -- in mind how much moisture

1 would affect the components?

2 A (Witness Johnston) No, I considered -- I don't
3 quantify it. I consider actually gross amounts of
4 moisture.

5 Q And when you say "gross amounts," we have an
6 allegation that discussed in Mr. Mosbaugh's presence was
7 the finding of eight ounces of water drained from diesel
8 air start trip lines. Would you consider that a gross
9 amount of water?

10 A (Witness Johnston) It would be a gross amount
11 of water if it were, you know, injected into any portion of
12 this. But I think in the case of corrosion...and again, as
13 we stated earlier, I'm not a corrosion expert...but I think
14 in the case of corrosion more damage can be done by having
15 saturated air exposed to these components than to simply
16 having water standing on them, and that is what I was
17 really considering. Will saturated air induce corrosion on
18 these components? And the response is: No, they've been
19 designed to tolerate that.

20 Q Can you explain why saturated air would cause
21 more corrosion than liquid?

22 A (Witness Johnston) Because of the presence of
23 free oxygen to help that corrosion.

24 Q And during your time on site do you recall any
25 discussions about water, in whatever quantity, being found

1 in diesel generator internals?

2 A (Witness Johnston) No, I do not recall any
3 discussions of finding water.

4 Q Were you on the site March 30th, 1990?

5 A (Witness Johnston) Yes, I was.

6 Q Mr. Owyong, were you?

7 A (Witness Owyong) No, I wasn't. No, I wasn't.

8 A (Witness Johnston) Excuse me, you said March
9 30th of '90, correct?

10 Q Yes.

11 A (Witness Johnston) You were there.

12 A (Witness Owyong) Oh, March -- oh, excuse me.
13 Yes, I was there. Yes.

14 Q And do you recall any -- any such discussions?

15 A (Witness Owyong) No. No.

16 Q Would you have been concerned if you had been
17 informed that eight ounces of water had been drained from
18 diesel trip start lines?

19 A (Witness Johnston) Yes.

20 A (Witness Owyong) Yes.

21 Q So you think that's something you'd recollect
22 today if it had -- had occurred and you were informed?

23 A (Witness Owyong) Yes.

24 Q Do you have any opinion on what color water
25 found in air start trip lines would be if drained from

1 them?

2 A (Witness Johnston) I think it depends on how
3 long the water was there. I mean, if it was freshly
4 introduced I would expect it to be clear; if it was
5 something that had been standing there for some time, run
6 through the compressors, it would start to take a tinge and
7 become murky. That's...

8 CHAIRMAN BLOCH: What color tinge?

9 Q Are we talking blue, for example?

10 A (Witness Johnston) No, I don't think it would
11 turn blue. Except possibly in the presence of -- of copper
12 there may be some blue tint to it. I don't know. It would
13 probably go a yellowish color.

14 Q Do you have any -- do you have any opinion on
15 whether eight ounces of water could be drained from diesel
16 trip lines using a 16-ounce jar?

17 A (Witness Johnston) I'm not sure I understand
18 the question. A 16-ounce jar will hold eight ounces of
19 water.

20 Q Well,...

21 A (Witness Johnston) I'm sorry.

22 Q ...I think you're right. But based on your
23 familiarity of the routing that the various lines go
24 through, could you fit a jar under all those lines at
25 Vogtle? You know, dependent on where the fitting locations

1 are where that draining might occur.

2 A (Witness Owyong) A single jar on all the
3 lines?

4 Q Single jar on a single line draining eight
5 ounces of water in a 16-ounce jar.

6 A (Witness Johnston) I think the longer lines
7 would have the capacity to hold eight ounces. Some of
8 those lines, such as those associated with the vibration
9 trips, branch and have quite a length to them. So yes, a
10 single line could hold that volume.

11 Q And would you have to deform the line in any
12 way to drain the water?

13 A (Witness Johnston) Well, it would have to be
14 disconnected at some point.

15 Q Would you expect there would be any
16 documentation at the site if that had been done?

17 A (Witness Johnston) I would think that if
18 somebody found eight ounces of water in any portion of it,
19 that documentation of that would be -- would be made.

20 Q And in your experience would Mr. Stokes or
21 Mr. Burr be concerned about a finding like that?

22 A (Witness Johnston) Could you repeat the
23 question, please.

24 Q Would Mr. Stokes or Mr. Burr be concerned about
25 the presence or the discovery of eight ounces of water from

1 diesel trip lines?

2 A (Witness Johnston) Yes.

3 A (Witness Owyong) Yes.

4 Q And in your experience, were these two
5 gentlemen diligent in following up on problems with the
6 diesel generators?

7 A (Witness Johnston) Yes.

8 A (Witness Owyong) Yes.

9 BOARD EXAMINATION

10 BY ADMINISTRATIVE JUDGE CARPENTER:

11 Q If we could return to our consideration of
12 these caps on the air start system, which you testified are
13 coated, what's the quality control for that coating in
14 terms of dimensions as small as a thousandths or less?

15 A (Witness Johnston) Well, the coating itself
16 has a dimension of less than a thousandths, considerably
17 less than a thousandths. As far...

18 Q That's a pretty thin coating.

19 A (Witness Johnston) Yes, sir, it is.

20 Q I don't think I'd call it a coating.

21 A (Witness Johnston) Well, it's actually a
22 plating process.

23 Q Oh.

24 A (Witness Johnston) I'm sorry if I didn't make
25 that clear.

1 Q Oh, "coating" suggests things like you paint
2 something and you have five mils or six mils specification
3 on the...

4 A (Witness Johnston) I apologize.

5 Q ...coverage of the coating.

6 A (Witness Johnston) I apologize for not making
7 that clear.

8 Q I'm not familiar with that particular product,
9 so the name didn't mean anything to me.

10 A (Witness Johnston) Understood. We use the --
11 again, Parko Lubrite is the commercial trade name for an
12 iron-manganese-phosphate coating. We apply it to the
13 starting air valve cage, the starting air valve cap. It's
14 applied to our cylinder liners, it's applied to -- to many
15 other components.

16 As I recall, because of the very tight
17 tolerances imposed on the manufacturer of the starting air
18 valve caps and the pretty stringent inspection requirements
19 that our Quality Department put on that, we were rejecting
20 quite a number of components submitted by our vendors, and
21 the vendor was contesting that the iron-manganese-phosphate
22 was actually affecting the dimensions, and that he was
23 providing good parts to our plater, who was screwing them
24 up. That was his allegation.

25 We checked into it, and if I remember, the --

1 the manganese-phosphate either produced no measurable
2 change using instruments accurate to a ten-thousandths of
3 an inch; either produced no measurable change, or produced
4 reduction in the ID of approximately 1/ten-thousandths of
5 an inch. So it's -- it's a very light deposit.

6 Q Is this coating just passively applied, or is
7 it electrolytically applied or what?

8 A (Witness Johnston) I believe it is
9 electrolytically applied.

10 Q Thank you. But you're not certain?

11 A (Witness Johnston) I'm not certain.

12 BOARD EXAMINATION

13 BY CHAIRMAN BLOCH:

14 Q And can you visually confirm that an entire
15 surface is coated with that plating?

16 A (Witness Johnston) Yes, if the surface -- if
17 the base material is a -- a bright metallic surface.

18 Q Well, were we dealing with a bright metallic
19 surface under the plating in this case?

20 A (Witness Johnston) Yes.

21 Q And you could visually confirm that it was
22 completely covered? If there were gaps you would have
23 noticed that?

24 A (Witness Johnston) Yes.

25 Q Judge Carpenter asked you a question this

1 morning about operating manuals for auxiliary equipment for
2 the diesels, do you recall that discussion?

3 A (Witness Owyong) Yes.

4 Q Do you expect that your purchaser would have
5 qualified engineers who can operate the auxiliary equipment
6 at the plant?

7 A (Witness Johnston) Yes.

8 Q And the individual most responsible for
9 operation of Vogtle's diesels was Mr. Stokes, is that
10 correct?

11 A (Witness Johnston) Mr. Stokes was the system
12 engineer, he's not responsible for operation.

13 Q Well, what about maintenance and any problems
14 associated with --

15 A (Witness Johnston) The maintenance would be
16 handled through the maintenance department. Mostly we
17 dealt with either Mr. Ray Howard or at that time I believe
18 Paul Hudson.

19 Q Did you ever have any interactions with Mr.
20 Handfinger?

21 A (Witness Johnston) Yes.

22 Q And were you confident that he and his staff
23 had the ability to resolve any problems with respect to
24 maintenance of the diesels?

25 A (Witness Johnston) Yes.

1 Q Did you also -- well, you said you observed
2 technicians doing calibrations activities. Did you observe
3 other craftsmen at Vogtle at work on the diesels during the
4 March 1990 time frame?

5 A (Witness Johnston) Yes. The contract with
6 Cooper was to perform turnkey maintenance in accordance
7 with the DRQR matrix, but there were other activities which
8 took place in the engine room. One that I believe comes to
9 mind for that time frame was inspections of heat exchangers
10 and also moving of oil and there were some inspections
11 performed in the oil system, if I remember. That type of
12 work was performed by Vogtle maintenance department.

13 Q In terms of the activities that you saw,
14 particularly with respect to testing of the diesels and
15 taking dew point measurements, if you witnessed any of
16 those, did you have any concern about the level of training
17 or qualification of the individuals performing those tasks?

18 A (Witness Johnston) No, I don't believe so. I
19 think as a result of the investigation, some shortcomings
20 in familiarization with the control system were identified,
21 but I don't think we had any concern about it at the time,
22 prior to that discovery.

23 Q So the only concerns that you can recall today
24 is with respect to the way technicians were using
25 calibration procedures or -- were implementing calibration

1 activities.

2 A (Witness Johnston) That's my recall.

3 A (Witness Owyong) Yes.

4 BOARD EXAMINATION

5 BY CHAIRMAN BLOCH:

6 Q I thought we had some discussion about concern
7 about over-tightening of swageloks.

8 A (Witness Owyong) There were some discussions,
9 but I was not concerned.

10 Q It doesn't represent a lack of good
11 craftsmanship in your opinion?

12 A (Witness Owyong) It does represent lack of
13 good craftsmanship, but it does not affect the system.

14 BY ADMINISTRATIVE JUDGE CARPENTER:

15 Q If over-tightening a number of fittings causes
16 a leak rate sufficient to overcome the rate at which air is
17 being supplied, how can you say it doesn't affect the
18 system?

19 A (Witness Owyong) Over-tightening a fitting
20 does not necessarily create a leak.

21 Q But the testimony is that they found leaks
22 which they ascribed to over-tightening the fitting. That's
23 the premise.

24 A (Witness Owyong) Okay. Then if that's the
25 case, then they could not correct the problem and they will

1 have to change out that fitting. But not necessarily over-
2 tightening a fitting would create a leak.

3 A (Witness Johnston) I think, Judge Bloch, you
4 asked if the act of over-tightening indicates poor
5 workmanship, and I think my response to that is that it is
6 something which I -- workmen which I have the highest
7 respect for their workmanship -- that is something which
8 occurs. If there is a leak in a line, one goes and puts a
9 little bit more torque on it to see if that nut will stop
10 leaking. And in my opinion, that in itself doesn't
11 constitute poor workmanship.

12 FURTHER CROSS EXAMINATION (Continued)

13 BY MS. YOUNG:

14 Q Would you expect there to be a detailed
15 procedure controlling that activity?

16 A (Witness Johnston) I would not expect it, but
17 I know that there are procedures for the use of swagelok
18 fittings.

19 Q And did you have any concerns about the
20 training of technicians who did calibration activities?
21 Did you get any indication that they weren't familiar with
22 the procedures or other documentation that they were using
23 to do the calibration activities?

24 A (Witness Johnston) I felt that the technicians
25 did not have a thorough understanding of the device. If

1 that's a shortcoming in training or personality, whatever,
2 the result was I didn't think they were familiar with the
3 device and fully understood what needed to be done to
4 calibrate it.

5 Q Mr. Owyong?

6 A (Witness Owyong) Yes.

7 Q And do you feel that those problems, whether
8 it's lack of understanding or whatever, were resolved by
9 the time you left the site April 3rd?

10 A (Witness Owyong) I felt comfortable that yes,
11 the problem was taken care of, yes.

12 A (Witness Johnston) Knowing what I know now,
13 after reviewing the Wyle report, I do not believe that
14 everything was resolved until that Wyle report was issued.

15 Q But when you left the site, were you under the
16 impression that your concerns had been addressed?

17 A (Witness Johnston) Yes.

18 MS. YOUNG: Thank you, gentlemen, the staff has
19 no further questions.

20 CHAIRMAN BLOCH: How much time do you have, Mr.
21 Kohn?

22 MR. MICHAEL KOHN: There's been a lot of note
23 scribbling so it may be -- I think we should take a ten
24 minute break.

25 CHAIRMAN BLOCH: If we take a ten minute break,

1 how much time do you expect to have after that?

2 MR. MICHAEL KOHN: Fifteen minutes.

3 CHAIRMAN BLOCH: We'll take a ten minute break
4 and hope that you'll finish in 15 minutes.

5 (A short recess was taken.)

6 CHAIRMAN BLOCH: The hearing will come to
7 order.

8 FURTHER CROSS EXAMINATION (Continued)

9 BY MR. MICHAEL KOHN:

10 Q Gentlemen, there was testimony that evaporation
11 out of the bowl over a period of time could occur. Do you
12 recall that?

13 A (Witness Owyong) Yes.

14 Q And do you also recall testifying that there
15 was no way for the water to get out of the system that was
16 evaporating?

17 A (Witness Owyong) Yes.

18 Q Now were there -- there were numerous fitting
19 leaks, correct?

20 A (Witness Owyong) During what period?

21 Q March-April 1990.

22 A (Witness Owyong) I still don't know, based on
23 -- numerous leaks on what?

24 Q You were aware that there were leaking swagelok
25 fittings in control tubing, correct?

1 A (Witness Owyong) I was told that they did
2 some snoop testing, yes.

3 Q And there were numerous leaks, correct? If I
4 recall correctly, it said almost every line was leaking.

5 A (Witness Johnston) Yes, that's correct. Can I
6 say something about air not getting out of the system?
7 There is flow through this system. As you actuate the
8 shutdown cylinder, a volume of air goes to the cylinder and
9 then it's vented to atmosphere. When the engine is shut
10 down, the Group 2 sensors vent their lines to atmosphere.
11 There are vents of various logic elements, so there is flow
12 of control air to atmosphere.

13 Q So there is a way for humid air to get out.

14 A (Witness Johnston) Yes.

15 A (Witness Owyong) My answer was based on the
16 regulator itself, the filter itself, saying that the only
17 way that if liquids did evaporate and get mixed with the
18 air or whatever, it would go through the filter. But then
19 it will then go through the rest of the system, and yes, it
20 will -- there are various methods of venting in the system
21 itself. The next component that it goes to is the
22 regulator and the regulator continually vents.

23 Q So there is flow for humid air to get out.

24 A (Witness Owyong) Yes.

25 Q And if there was enough flow of humid air over

1 a few days or weeks to introduce water, would it be logical
2 that there could be enough flow of dry air to evaporate the
3 same water out of the system, over the same period of time?

4 A (Witness Johnston) It's possible that could
5 occur.

6 Q Is there a crankshaft position where the
7 failure of one air start valve could cause a weak air roll
8 or failure to start?

9 A (Witness Johnston) There should not be a
10 position that would cause a failure to start and as far as
11 a weak air roll, you would have to be more specific.

12 Q Is there any crankshaft position that could
13 result -- that would be a starting point that could result
14 in a weak air roll?

15 CHAIRMAN BLOCH: Are you making any other
16 assumptions other than just the position?

17 MR. MICHAEL KOHN: Where a failure of one air
18 start valve would be -- let me rephrase it.

19 BY MR. MICHAEL KOHN:

20 Q Could the failure of one air start valve cause
21 a weak air roll based on any given crankshaft starting
22 position?

23 A (Witness Johnston) Okay, we have to still be
24 more specific yet. Is the valve stuck open or is the valve
25 stuck closed?

1 Q Either.

2 A (Witness Johnston) It make a difference.

3 Q Then you can address both.

4 A (Witness Johnston) Okay, with the valve stuck
5 in the closed position, there should not be any crankshaft
6 position that will result in a failure to start. Now as to
7 a weak air roll, if the crankshaft were positioned such
8 that the piston associated with that cylinder's starting
9 air valve were in its power stroke, the start would be
10 slowed by some small amount, because it would not get the
11 same magnitude of initial kick from the starting air
12 pressure than it would be if the crankshaft were at a
13 static position with another valve that was functioning
14 properly. Is that clear?

15 Q And that would cause a weak air roll?

16 A (Witness Johnston) That would cause a slower
17 start than would be the case if two valves were functioning
18 as they should at a static crankshaft position. Now the
19 weak air roll -- and that's rather vague terminology that
20 was associated with the July sequence of events -- occurred
21 when a valve was stuck in a open position. And what that
22 created is a failure of a cylinder to vent the starting air
23 signal when it needed to. So it kept charging as the
24 piston came up to the compression stroke, which was trying
25 to fight the rotation of the engine. What it did was the

1 engine would begin to rotate, then it hesitated. If it had
2 enough momentum, it would go on through; if it didn't have
3 enough momentum, it actually rolled backwards. And that's
4 what the customer designated as a weak air roll.

5 Q There was testimony about the service of
6 moisture traps. If water is introduced into the trap
7 during a period of high humidity, couldn't it evaporate
8 during a period of low dew points?

9 A (Witness Johnston) The moisture trap is
10 supposed to be a self-draining device.

11 Q So it would normally drain?

12 A (Witness Johnston) Yes.

13 Q So you wouldn't expect to see moisture in
14 there, an accumulation of moisture in there?

15 A (Witness Johnston) Are those moisture traps
16 float operated?

17 A (Witness Owyong) I think so, yes.

18 A (Witness Johnston) Okay, they will take a
19 certain amount of moisture before the drain actuates, so
20 there would be some percentage of moisture in there.

21 Q And that residue moisture in there could
22 evaporate out during a period of low dew point operation of
23 the machine?

24 A (Witness Johnston) I'm not certain if that
25 could occur or not, because I don't believe that the flow

1 from the air compressor is directed through the moisture
2 trap, I think it is a T'd leg from the flow, but I'm not
3 certain enough of the installation to be able to answer
4 that.

5 Q And are some of the traps near the engine?

6 A (Witness Johnston) No, they're located in the
7 air dryer unit.

8 Q You said that after the Wyle report was issued,
9 you would have corrected the immersion of the sensor.

10 A (Witness Johnston) That's correct.

11 Q Why are you so concerned about immersion?

12 A (Witness Johnston) The Wyle report stated that

13 --

14 CHAIRMAN BLOCH: The witness is looking around
15 like he'd like to seeing the Wyle report.

16 WITNESS JOHNSTON: It would help, but I think I
17 can recall this, if I can get the word in mind.

18 A (Witness Johnston) The Wyle report indicated
19 that residue from the evaporation of water, such as mineral
20 deposits, can alter the spacing on the collars in the
21 sensing element and can have, if I recall, up to a ten
22 degree effect on the set point of the device.

23 Q At the time you left the site, wasn't there
24 still an open question that there could have been an actual
25 high jacket water temperature condition at the time of the

1 site area emergency due to stratification?

2 A (Witness Johnston) No.

3 Q Why was that?

4 A (Witness Johnston) I think what you're
5 referring to is a proposal that I put forth trying to
6 explain why the temperature device would trip on March 20th
7 when it had not tripped previously, and what I theorized
8 may have occurred was that the jacket water standpipe
9 heater -- pardon me -- the jacket water heater located in
10 the standpipe, would create a zone of higher temperature
11 water than may be expected to find in the cylinder block,
12 and that it was possible, if a high temperature trip were
13 calibrated at a point that was marginally above the normal
14 operating temperature of the engine, if the keep warm
15 temperature were higher than the normal jacket water
16 temperature during operation and if this zone of stagnant
17 water in the standpipe were even higher yet, that as you
18 move that zone of water past the temperature device, you
19 could trigger it to vent.

20 Georgia Power consider that, it was discussed
21 with the NRC IIT members, and Georgia Power designed a test
22 to either demonstrate that or disprove it and their test
23 disproved it.

24 Q Well, wasn't that test done after you left the
25 site?

1 A (Witness Johnston) That's correct.

2 Q You also testified about corrosion about
3 metal -- metal surface corrosion would occur with -- let me
4 rephrase it -- that the corrosion of a metal surface would
5 occur at a faster rate if exposed to humid than in the
6 presence of actual water?

7 A (Witness Johnston) As I stated earlier, I'm
8 not a corrosion expert. I would expect that saturated air
9 could produce more corrosion than immersing a component in
10 water.

11 Q Okay. But you don't know that.

12 A (Witness Johnston) I am not a corrosion
13 expert.

14 Q If I asked you to think about a -- and your
15 belief was because of free oxygen?

16 A (Witness Johnston) Because of the oxygen
17 content of the air, yes.

18 Q And isn't it true that there's dissolved oxygen
19 in water, especially at 250 pounds of pressure?

20 A (Witness Johnston) There is dissolved oxygen
21 in water, yes.

22 Q And if we put a clean surface outside in humid
23 air, but there was -- no water got on the surface, it
24 wouldn't rain or anything -- would you say that it would rust
25 faster than if a similar surface was put out in the same

1 condition and it was rained on the following day -- which
2 surface do you think would have the most corrosion?

3 A (Witness Johnston) I'm sorry, I'm not a
4 corrosion expert.

5 CHAIRMAN BLOCH: Mr. Kohn, are you sure it
6 matters to your contention whether the corrosion is faster
7 in a moist environment or in a water environment?

8 BY MR. MICHAEL KOHN:

9 Q As I understand it, you were not investigating
10 air quality at the site.

11 A (Witness Owyong) That's correct.

12 Q And so -- and I also understand that there was
13 no procedure to keep you informed of everything that was
14 occurring while you were not at the site, were not involved
15 in particular activities.

16 A (Witness Owyong) That's correct.

17 Q And so if the persons associated with finding
18 water reported those findings to the people they knew were
19 responsible for investigating air quality, they may not
20 tell you about it, is that correct?

21 A (Witness Owyong) That's correct.

22 Q Now are you aware that after the Wyle report
23 was issued, that craftsmanship problems, in particular
24 continuing to find leaks in the pneumatic trip lines, was
25 occurring at Plant Vogtle?

1 A (Witness Owyong) No, I was not aware of that.

2 Q You referenced Board Exhibit 8 in your
3 testimony, is that correct?

4 A (Witness Johnston) Can you identify which
5 page?

6 Q Yes, I think that was the exhibit with your
7 handwriting in. Other than the incident in 1991 (Board
8 Exhibit 8) -- it's on page 15 and I think one other place
9 in your testimony.

10 A (Witness Owyong) Yes.

11 Q You have that in front of you?

12 A (Witness Owyong) Yes.

13 MR. BLAKE: I have an objection to this
14 unless -- I don't recall any questions from the NRC staff
15 on this exhibit.

16 MR. MICHAEL KOHN: On craftsmanship.

17 MR. BLAKE: Excuse me?

18 MR. MICHAEL KOHN: The exhibit is being shown
19 with respect to craftsmanship.

20 CHAIRMAN BLOCH: Continue.

21 BY MR. MICHAEL KOHN:

22 Q And are you aware that the work order
23 associated with the document marked as Board Exhibit 8
24 indicated that they had to correct several leaks to low
25 boil pressure switches by tightening fittings?

1 MR. BLAKE: This is 1991, Judge. I think it's
2 outside the scope and I object again.

3 CHAIRMAN BLOCH: What's the relevance to the
4 notice about whether or not they had concerns of
5 craftsmanship when they were at the site?

6 MR. MICHAEL KOHN: It indicates that -- I think
7 their testimony is more that whatever concerns they had
8 were resolved, and this goes to indicate that the
9 craftsmanship concerns may not have been resolved.

10 CHAIRMAN BLOCH: Well, in fact I think their
11 testimony -- did you have craftsmanship concerns while you
12 were on the site?

13 WITNESS JOHNSTON: No, sir, we didn't.

14 WITNESS OWYOUNG: No.

15 CHAIRMAN BLOCH: Let's go to another question.

16 MR. MICHAEL KOHN: Your Honor, we're at the end
17 of the questions.

18 CHAIRMAN BLOCH: Okay. We're going to ask
19 staff first. Staff?

20 MS. YOUNG: No questions.

21 CHAIRMAN BLOCH: Mr. Blake.

22 REDIRECT EXAMINATION

23 BY MR. BLAKE:

24 Q Mr. Owyong or Mr. Johnston, you were asked
25 whether or not you'd ever done any kind of detailed

1 analyses of the effects of water on the control air system
2 logic board and your answer was no. Is there a reason that
3 you never did any kind of detailed analysis in the system?

4 A (Witness Owyong) Do you want to answer that?

5 A (Witness Johnston) Go ahead.

6 A (Witness Owyong) There was basically no
7 reason because you've got to realize that the system -- the
8 evolution of the controls were over many years and there
9 was never a requirement from our customer to do such, and
10 there was never a concern by Transamerica Enterprise people
11 of water in the system.

12 Q Do you have a concern today that you don't have
13 those analyses available?

14 A (Witness Owyong) No.

15 Q And why is that?

16 A (Witness Owyong) Because again, the system is
17 a very rugged system and it can tolerate some liquids.

18 Q If -- you have available to you your --
19 Intervenor's Exhibit 223. Can you locate that?

20 A (Witness Johnston) Can you identify it
21 please -- oh, I just found it here. That's my personal
22 notes.

23 Q Yes, it's what you referred to before I think
24 as your outage notes or personal outage notes.

25 A (Witness Johnston) Yes.

1 Q Can you locate in that your notes for 3/31/90?
2 MR. MICHAEL KOHN: I believe it's the third to
3 the last page.

4 WITNESS JOHNSTON: Yes, I've got it.

5 MR. BLAKE: I believe so.

6 BY MR. BLAKE:

7 Q Looking at the second page of the notes that
8 you apparently made on 3/31/90, in particular the top
9 paragraph and bottom paragraph on that page, look at those
10 for a moment, if you would, please.

11 A (Witness Johnston) Yes.

12 Q Do your notes -- when would you have made these
13 notes that are dated 3/31/90?

14 A (Witness Johnston) On 3/31/90.

15 Q So these are contemporaneous notes by you on --
16 on that day?

17 A (Witness Johnston) Yes.

18 Q These were notes that were made at that point
19 in time?

20 A (Witness Johnston) Yes.

21 Q And -- and do those two paragraphs indicate
22 that the -- that you had a view of the most probable cause
23 of the March 20 event?

24 A (Witness Johnston) Yes.

25 Q And that you had a level of confidence with

1 regard to what caused the problem?

2 A (Witness Johnston) Yes.

3 Q Do you have Intervenor Exhibit 226?

4 A (Witness Johnston) Can you identify that,
5 please.

6 Q Yes, it's been identified as, again, personal
7 notes. It starts on the first page by saying, "Georgia
8 Power 2A76023."

9 A (Witness Johnston) I don't have that. That
10 was taken back.

11 (The witnesses were handed certain material.)

12 A (Witness Johnston) Yes, 226.

13 Q Would you look at the third page of that
14 exhibit. It starts at the top by saying, "Check of air
15 start valve actuation."

16 A (Witness Johnston) Yes.

17 Q Now, when would -- would this note have been
18 made, this page?

19 A (Witness Johnston) Again, these notes would be
20 made at the time either actually during the course of the
21 inspections or prior to the next -- the following day.

22 Q So either right at the time of the inspection
23 or immediately thereafter you would have made these?

24 A (Witness Johnston) That's correct.

25 Q If you look at the bottom of -- of that third

1 page where it says, "Pulled air start cap from Number 8-R,"
2 et cetera, and, "Find cap and piston to be clean," what
3 does that mean?

4 A (Witness Johnston) That means, as I stated
5 before, the -- the piston actually appeared to be new, and
6 I found nothing in the way of debris or -- or any abnormal
7 condition inside the cap. They appeared to be clean.

8 Q Turn two pages, if you would, to a page that
9 has in the upper right-hand corner some date, 13/90.

10 A (Witness Johnston) That's 7/13/90.

11 Q In -- about six or seven lines down into that
12 text there's the word "cleaned," with some indication
13 around it. Do you see that?

14 A (Witness Johnston) Yes, I do.

15 Q What is that indication around it?

16 A (Witness Johnston) That's "cleaned," in
17 parenthesis, which means we had chucked these parts up in a
18 lathe and had very, very lightly dressed them with emery
19 cloth. I would not term that as actually turning them
20 because we never applied a tool, a lathe tool to them. We
21 simply applied the emery cloth and -- and literally just
22 lightly sanded the OD on them to achieve this two- to
23 three-thousandths clearance.

24 I put the parenthesis around the word
25 "cleaned," because that's really not technically what we

1 did, but we removed so little material I -- I didn't want
2 to say "machined."

3 Q Were you removing actual integral material of
4 the component, or were you removing any sort of surface
5 material on the component?

6 A (Witness Johnston) Material -- I'm sorry.
7 Material of the component.

8 Q Was there any surface -- anything on the
9 surface other than the material made -- the component was
10 made of?

11 A (Witness Johnston) Ray Howard identified --
12 and I think it's on just -- on that same page, just three
13 or four lines below what you're referring to, Ray Howard
14 reported finding some oil on the top of one of the pistons,
15 and that was the only finding of anything on these
16 components that was unusual at all. All the rest of them
17 were clean in the -- in the factual sense of the term
18 "clean."

19 BOARD EXAMINATION

20 BY CHAIRMAN BLOCH:

21 Q Excuse me. When you say you cleaned the
22 material, I can't tell from this text whether you were
23 cleaning the piston or the cap.

24 A (Witness Johnston) This was the piston.

25 Q You were cleaning the piston?

1 A (Witness Johnston) And -- and again, please,
2 the -- and the reason I put it in those parenthesis,...

3 Q No, I understand exactly what you said, but I
4 just couldn't tell which part it was that you were working
5 with.

6 A (Witness Johnston) Yes. It was the OD of the
7 piston.

8 REDIRECT EXAMINATION (Continued)

9 BY MR. BLAKE:

10 Q Now, you two gentlemen were there on -- were at
11 the Plant Vogtle site on March 30, 1990, correct?

12 A (Witness Owyong) That's correct.

13 Q March 30?

14 A (Witness Johnston) Yes.

15 Q And you were there as vendor representatives
16 from the diesel generator vendor?

17 A (Witness Johnston) Yes.

18 A (Witness Owyong) Yes.

19 Q And you were involved in testing of the control
20 systems during that period of time?

21 A (Witness Johnston) Yes.

22 A (Witness Owyong) Yes.

23 Q If eight ounces of water had been drained from
24 a control trip line on March 30, 1990, would that have been
25 news?

1 A (Witness Johnston) Yes.

2 A (Witness Owyong) Yes.

3 Q Is there any doubt in your mind that you would
4 have been -- that you would have learned about it, whether
5 it occurred when you were specifically on site or when you
6 came back on site?

7 A (Witness Johnston) No.

8 Q Mr. Owyong?

9 A (Witness Owyong) What was the question?

10 Q Is there any doubt in your mind that you would
11 have learned about it, somebody would have told you about
12 it, whether you were on site at the time it was actually
13 detected, or when you next came back on site?

14 A (Witness Owyong) No.

15 MR. BLAKE: I have no more questions.

16 CHAIRMAN BLOCH: I have one question.

17 BOARD EXAMINATION

18 BY CHAIRMAN BLOCH:

19 Q Mr. Johnston, when we spoke on Friday I believe
20 you said that if you didn't know about the prior water
21 problems you don't know if you would have reported the very
22 small amount of water that you found recently to
23 Mr. Stokes. The question I have is: Do you have any basis
24 for knowing whether water problems would have been reported
25 to Mr. Stokes prior to the site area emergency?

1 Again, that's to my recollection.

2 Q So in your mind there wasn't a question about
3 overtorquing?

4 A (Witness Johnston) No.

5 Q Which would have caused over-creeping?

6 A (Witness Johnston) That's correct.

7 Q Thank you.

8 BOARD EXAMINATION

9 BY CHAIRMAN BLOCH:

10 Q I'm sorry, there's a quality control hold point
11 on the torquing both of the sensors and of the swage locks
12 on the line?

13 A (Witness Johnston) I'm sorry, I understood his
14 question to be -- he led into it with the -- with the swage
15 lock fittings, but I understood the question to be starting
16 air valve cap screws only.

17 CHAIRMAN BLOCH: Mr. Kohn?

18 RE-CROSS EXAMINATION

19 BY MR. MICHAEL KOHN:

20 Q I think your previous testimony was that you
21 were not informed of the fact that high dew point -- that
22 the first... Let me rephrase it.

23 Are you aware that the first dew point
24 measurement taken after the site area emergency indicated
25 that the diesel -- the 1-A diesel was out of specification

1 due to high dew points?

2 A (Witness Johnston) I don't remember that.

3 Q Okay.

4 A (Witness Owyong) I don't, either.

5 Q And isn't that the type of information you
6 think you would have learned about if it actually happened?

7 A (Witness Johnston) It's -- it's very likely
8 that we would have learned about it. I don't know that if
9 it's something -- that it's something that I would have
10 remembered.

11 Q And based on your knowledge of thermal
12 expansion, isn't the 20 degree temperature difference
13 between -- at Vogtle's jacket water still insufficient to
14 cause binding?

15 A (Witness Johnston) No, not if the -- the
16 diametrical clearance existing between the components is
17 less than the expansion of the -- of the differential
18 thermal expansion over a 20 degree range.

19 Q Did you...?

20 A (Witness Johnston) We were dealing with
21 extremely marginal clearances on these components.

22 Q And do you remember what your calculation was
23 for that?

24 A (Witness Johnston) Our calculation was that
25 with 100 degree delta T, the expected reduction of

1 diametrical clearance is on the order of .65-thousandths of
2 an inch.

3 Q And that would be from room temperature up to
4 170 degrees?

5 A (Witness Johnston) That would be a delta T of
6 100 degrees.

7 Q And that's what your calculation was based on?

8 A (Witness Johnston) That's correct. So a 20
9 degree differential would be one-fifth of that.

10 Q But that already takes into account Vogtle's
11 higher temperature?

12 A (Witness Johnston) The calculation is a 100
13 degree delta T; the difference between the expansion at 100
14 degrees and the expansion at 80 degrees would be a
15 reduction of one-fifth.

16 MR. MICHAEL KOHN: No further questions.

17 CHAIRMAN BLOCH: Staff?

18 RE-CROSS EXAMINATION

19 BY MS. YOUNG:

20 Q Cooper was the vendor that supplied the air
21 receivers to Vogtle?

22 A (Witness Johnston) We supplied them as part of
23 the contract, but it was manufactured by a sub-vendor.

24 Q Did you ever observe any blow down activities
25 at Vogtle, blow down of the air receivers during April-

1 March 1990?

2 A (Witness Johnston) I don't recall.

3 A (Witness Owyong) During what period? What
4 was the question again?

5 Q Did you ever observe any blow down of the air
6 receivers?

7 A (Witness Owyong) During what period of time?

8 Q When you were there in March and April 1990?

9 A (Witness Owyong) No, I don't recall.

10 CHAIRMAN BLOCH: Now, that would include bleed
11 and feed. Did you observe any of that?

12 WITNESS JOHNSTON: I don't recall. We
13 certainly observed it on many occasions, but what time
14 frame, just don't recall.

15 BY MS. YOUNG:

16 Q Okay. In your experience, does a 24-hour bleed
17 and feed of a air receiver (sic) reduce dew points within
18 acceptable levels?

19 A (Witness Johnston) I think we -- we talked
20 about this yesterday. Generally when the compressors are
21 brought back into service at some point during the outage,
22 it requires at least 24 hours to get the dew point to
23 levels that Ken Stokes says are acceptable. If they don't
24 make it in that period of time, they -- they do the bleed
25 and feed. And, you know, sometimes it takes 24 hours,

1 sometimes 36.

2 Q Do you know whether the temperature of the high
3 jacket water reservoir would have any effect on the
4 temperature of the air receiver?

5 A (Witness Johnston) No.

6 A (Witness Owyong) No.

7 A (Witness Johnston) Should be independent.

8 Q And I'm talking about the walls of the air
9 receiver.

10 A (Witness Johnston) Yes, I understand. But
11 they're -- they're physically separated by -- at the
12 closest the receivers to the engine are at least 30 feet.

13 A (Witness Owyong) Yes.

14 MS. YOUNG: No further questions.

15 FURTHER REDIRECT EXAMINATION

16 BY MR. BLAKE:

17 Q Gentlemen, my -- my question is prompted by
18 Mr. Kohn's last question to you about if you -- did you not
19 hear about a dew point immediately after the accident. And
20 that really triggers it. And included in it is all the
21 other questions and assumptions and...

22 MR. MICHAEL KOHN: Excuse me.

23 Q ...hypotheses. Excuse me, let me finish my
24 question.

25 MR. MICHAEL KOHN: I have an objection.

1 MR. BLAKE: Well, you might, but let me finish
2 it.

3 CHAIRMAN BLOCH: Let him finish the question,
4 then make your objection.

5 MR. BLAKE: Given the question...

6 CHAIRMAN BLOCH: You think he's leading the
7 witness?

8 BY MR. BLAKE:

9 Q Given the question by Mr. Kohn on -- on your
10 hearing or not hearing about a high dew point, the first
11 one taken after March 20, and the other hypotheses and
12 postulates put to you, is there anything that you have
13 heard, anything that alters your opinion about whether or
14 not water or moisture played a role in the March 20 event?

15 A (Witness Johnston) No.

16 A (Witness Owyong) No.

17 CHAIRMAN BLOCH: Mr. Kohn?

18 FURTHER RE-CROSS EXAMINATION

19 BY MR. MICHAEL KOHN:

20 Q If you were not told about finding water in the
21 diesel that would alter your opinion, wouldn't it?

22 MR. BLAKE: I have an objection because I don't
23 understand the question.

24 BY MR. MICHAEL KOHN:

25 Q If you were not told that water had been

1 drained out of a trip line after the site area emergency,
2 that would alter your opinion as to whether water was part
3 of the root cause of the -- of the site area emergency?

4 CHAIRMAN BLOCH: I think your question is
5 misspoken.

6 MR. MICHAEL KOHN: It may...

7 CHAIRMAN BLOCH: If water had been drained out
8 and you weren't told, would that alter your opinion?

9 MR. MICHAEL KOHN: Thank you.

10 WITNESS JOHNSTON: No.

11 WITNESS OWYOUNG: No.

12 MR. MICHAEL KOHN: No further questions.

13 CHAIRMAN BLOCH: Staff? Mr. Blake?

14 MR. BLAKE: No more questions.

15 CHAIRMAN BLOCH: Okay, we have a matter, a very
16 brief statement, because we want to take official notice of
17 something so that the parties would be able to contest it
18 if they would like to. It's a matter of our understanding
19 of craftsmanship on the swage lock fittings, and Judge
20 Carpenter will make a very brief statement.

21 BOARD EXAMINATION

22 BY ADMINISTRATIVE JUDGE CARPENTER:

23 Q If I understand your testimony, it is to the
24 effect that workmen who install swage lock couplings,
25 unions, or perhaps pipe thread to swage lock fitting on a

1 sensor, and produce leaks or damage through overtightening,
2 you would not consider that to be inferior craftsmanship or
3 unacceptable craftsmanship, is that your position?

4 A (Witness Johnston) If I remember the
5 discussion where we were talking about this, I think it had
6 to do with -- I understood it to be a reflection -- is
7 it... I guess the way I understood the question was: If
8 somebody overtightened the swage lock fitting, did that act
9 make him a poor craftsman. And my response to that was: I
10 think somebody going up there and retightening a swage lock
11 fitting where he suspects a leak, and not doing it in
12 accordance with the swage lock inspection tool which
13 measures the gap between the cap and the -- and the swage
14 lock fitting body, that he simply goes up there and puts a
15 little bit more torque on the nut to slow the leak, I don't
16 think that act, itself, designates that individual as a
17 poor craftsman. That's the way I understood the question,
18 and that's the way I responded to it.

19 Q You don't feel that craftsmen should try to
20 understand what's causing the distress? Like take it apart
21 and look at it?

22 A (Witness Johnston) If a -- if a tube is
23 leaking, a minor amount is -- is detected by snoop or a
24 bubble test, and he goes up and looks at it and puts a
25 wrench on it, the first thing -- the first thing I would

1 expect a craftsman to do is to go up and put a wrench on it
2 and see if the fitting is tight.

3 Q Yes.

4 A (Witness Johnston) In the act of doing that to
5 determine if it's tight, he will very likely impart a
6 little bit more torque to that nut. It would be very
7 likely that he would do that without the swage lock
8 inspection tool. And I know that craftsmen that -- that
9 I've worked with rarely use the swage lock inspection tool.
10 That -- that's quite simply the -- the way that I viewed
11 the question and considered it when I responded to you.

12 Q Well, the manufacturer of the device felt that
13 there was a need for an inspection tool in order for the
14 craftsman to do his job properly, isn't that true?

15 A (Witness Johnston) That's possible. It's also
16 possible that the manufacturer developed that inspection
17 tool based on people saying, "We want some way of going out
18 and developing procedure for this." And the majority of
19 the people that use these fittings have never heard of the
20 inspection tool or never used it.

21 Q I won't argue with that.

22 A (Witness Johnston) Okay.

23 BOARD EXAMINATION

24 BY CHAIRMAN BLOCH:

25 Q Okay, when you're talking about the majority of

1 people, are you talking about nuclear plant people?

2 A (Witness Johnston) No, I would say, you know,
3 nuclear plants are the only place I've ever seen the
4 inspection tool.

5 Q And generally do they know how to use them?

6 A (Witness Owyong) The tool is a go or don't go
7 gauge. So you put it in there; if it doesn't go in then
8 it's overtightened. If it goes in, wiggles around, then
9 you -- you have room. I mean, it's...

10 BOARD EXAMINATION

11 BY ADMINISTRATIVE JUDGE CARPENTER:

12 Q I think you're -- you're making your position
13 clear. In other facilities have you encountered leaking
14 lines to sensors?

15 A (Witness Johnston) Yes.

16 Q Of the same magnitude as were observed at
17 Vogtle in terms of number of fittings that had to be
18 tightened and so on?

19 A (Witness Johnston) Yes.

20 Q So it was not a one-of-a-kind event in your
21 mind?

22 A (Witness Johnston) No, sir. And, again, you
23 know, the control system is designed with the expectation
24 of leaks, and that's why we have the makeup orifices.

25 Q That's why I emphasized "number of leaks,"

1 rather than "a leak."

2 A (Witness Johnston) Right.

3 Q I realized that it's very tolerant of some
4 misadventures with connections. But you didn't feel that
5 this was unusual at all?

6 A (Witness Johnston) No.

7 Q As the diesel engine is operated over a period
8 of time is there a tendency for these swage lock fittings
9 to loosen?

10 A (Witness Owyong) I would say yes.

11 Q My thought being is -- is the leaking caused by
12 a failure to make up the line properly to begin with, or
13 that it was initially made up properly and subsequently
14 loosened at several fittings?

15 A (Witness Johnston) My experience is generally
16 the leaks occur at places that were not properly made up.

17 A (Witness Owyong) In my past experience I have
18 found more leaks on the engine than in the control panel.

19 Q You think that's due to the vibration of the
20 engine?

21 A (Witness Owyong) Yes.

22 Q Thank you very much.

23 CHAIRMAN BLOCH: Based on Judge Carpenter's
24 questioning, which was a different procedure than I had
25 anticipated, are there further questions by Intervenor?

1 FURTHER RE-CROSS EXAMINATION

2 BY MR. MICHAEL KOHN:

3 Q Just to make sure, you did not know the
4 magnitude of the leaks after the site area emergency, so
5 you really have no way to determine what -- to compare to
6 the magnitude of leaks you found at...?

7 CHAIRMAN BLOCH: Okay, you already have a
8 record on that.

9 MR. MICHAEL KOHN: Yeah, that's what -- I
10 figured so. I have no further questions.

11 CHAIRMAN BLOCH: Ms. Young?

12 MS. YOUNG: No questions.

13 CHAIRMAN BLOCH: Mr. Blake?

14 Good night. See you at 8:30 in the morning.

15 MR. MICHAEL KOHN: Oh, Your Honor,...

16 CHAIRMAN BLOCH: Yes.

17 MR. MICHAEL KOHN: ...being it's now 6:00, I
18 think 9:00 is a more reasonable time to start.

19 MR. BLAKE: I agree with that, and let me tell
20 you why. Because I have acquiesced to Mr. Kohn's request
21 to just bring the three I&C techs tomorrow. So with just
22 that lineup, I think we'll have ample time if we just start
23 at 9:00, rather than at 1:00. And I've also asked them to
24 bring the instruments in the off chance we don't wind up
25 back here at Augusta, and the fact that they're the only

1 witnesses scheduled for tomorrow with four hours, seems to
2 me we ought to be able to handle whatever demonstration the
3 Board wants, or familiarity with the instruments.

4 ADMINISTRATIVE JUDGE CARPENTER: Do you know
5 where we can find some humid air?

6 MR. BLAKE: Yes, we will -- we will -- we will
7 also generate humid air for the Board for tomorrow.

8 CHAIRMAN BLOCH: Hold on a second.

9 MR. BLAKE: And I'm distributing...

10 CHAIRMAN BLOCH: Thank you. See you at 9:00.

11 MR. BLAKE: ...I'm distributing the corrected,
12 revised in the upper right-hand corner, affidavit of James
13 A. Bailey which corrects the exhibits attached to it.

14 CHAIRMAN BLOCH: And we are adjourned.

15 (Whereupon, the hearing was adjourned at
16 5:55 p.m., to resume at 9:00 a.m. on Friday,
17 August 25, 1995.)

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C E R T I F I C A T E

This is to certify that the attached proceedings before the
U. S. Nuclear Regulatory Commission in the matter of:


Name of Proceeding: Georgia Power Company (Vogtle
Electric Generating Plant, Units 1
and 2)

Docket Number: 50-424-OLA-3 and 50-425-OLA-3

Place of Proceeding: Augusta, Georgia

Date: August 24, 1995

were held as herein appears, and that this is the original
transcript thereof for the file of the United States
Nuclear Regulatory Commission taken by me and, thereafter
reduced to typewriting by me or under the direction of the
court reporting company, and that the transcript is a true
and accurate record of the foregoing proceedings.



WILLIAM L. WARREN
Official Reporter

NEAL R. GROSS AND CO., INC.