

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF OHIO
WESTERN DIVISION

UNITED STATES OF AMERICA,) Docket No. 3:06CR712
Plaintiffs,) Toledo, Ohio
v.) October 18, 2007
DAVID GEISEN, ET AL.) Jury Trial
Defendants.)

TRANSCRIPT OF JURY TRIAL VOLUME 10 OF 15
BEFORE THE HONORABLE DAVID A. KATZ
UNITED STATES DISTRICT JUDGE

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1 THE COURT: Ready?

2 MR. HIBEY: We are, Your Honor. Good morning,
3 Your Honor.

4 THE COURT: Good morning.

5 MR. HIBEY: Your Honor, the defendant David
6 Geisen respectfully moves for a judgment of acquittal at
7 the close of the government's case against him. There
8 are -- there are two fundamental propositions in support of
9 our view of the evidence that would lead us to conclude
10 that a rationale trial of fact would not be able to find
11 the essential elements of the crimes charged beyond a
12 reasonable doubt.

13 The first has to do with the fact that the
14 government has alleged and has sought to prove a single
15 scheme in which these defendants and Andrew Siemaszko,
16 together, committed five violations of false statement laws
17 of the United States.

18 And the second proposition arises out of the
19 allegation in the indictment in, I believe, paragraph 11 in
20 the recitals, that fundamentally paragraph 12, that says,
21 in pertinent part, based on the information contained in
22 the serial letters, the NRC agreed to FENOC's proposal that
23 it be allowed to operate Davis-Besse beyond December 31st,
24 2001.

25 With respect to the first proposition, Your

1 Honor, that is that we're dealing here with a single
2 scheme. It is important to understand what that is, and
3 what it is, the scheme, is a systematic plan of action that
4 was participated in by these defendants and Andrew
5 Siemaszko, all of whom had, at the time, knowledge of the
6 falsity of the statements and the specific intent to
7 deceive the NRC through trick, artifice and device, and
8 under count one, in the nature of affirmative concealment,
9 made false statements to the NRC.

10 We respectfully suggest that there is no evidence
11 that these three men engaged in such a scheme, that there
12 is no evidence that they commonly shared such knowledge of
13 the falsity of the statements in the serials at a time when
14 they knew the serial statements were made. Each openly was
15 doing his job. There was nothing covert about their
16 activities. There was nothing concealed by an affirmative
17 act, which we understand the government must prove in order
18 to make out a scheme under A-1 of 10-01 in the code. The
19 incorrectness of the statements does not make out an act of
20 affirmative concealment.

21 The government has conceded this during the
22 briefing and arguments attending the motion to dismiss on
23 grounds of multiplicity. It's appropriate to return to
24 that particular proposition because here this scheme only
25 works as a scheme to be put before the jury for its

1 consideration if there is an affirmative act of
2 concealment. And on top of that, there must be specific
3 intent to deceive the NRC. And our position is, of course,
4 that there is no such evidence in the record.

5 As a matter of fact, there are some salient
6 points of evidence that I would like to bring to your
7 attention this morning. For example, Prasoon Goyal
8 testified that Mr. Geisen had no involvement in the
9 drafting of 2731. 2731 is count one. Steve Moffitt
10 testified that Mr. Geisen learned of certain information,
11 that certain information that had been provided to the NRC
12 was incorrect, was terribly distressed by that development
13 and immediately took it to Steve Moffitt in order for it to
14 be cured. And Moffitt, in turn, took it up the line, and
15 it was determined that the cure to the incorrect
16 information that Mr. Geisen realized had been conveyed to
17 the NRC would be accomplished in 2735.

18 So again, we have clear evidence in the
19 government's case of the absence of any specific content on
20 the part of Mr. Geisen to deceive the NRC.

21 And then my third example is the fact that once
22 we parse through the testimony of Mr. Ulie, who was the
23 last witness to appear, the one who purportedly was
24 summarizing Mr. Geisen's statements at an interview, he
25 made clear that -- that Mr. Geisen made clear his knowledge

1 regarding incorrect information was acquired, and that the
2 vast majority of the knowledge about which he was talking
3 about during the interview came after he had -- after the
4 event had occurred and he had gone back to study all the
5 necessary materials to find out what happened, something
6 that he wanted to understand for himself.

7 Now, these, Your Honor, are, therefore, three, I
8 think, salient examples of the complete absence on the part
9 of Mr. Geisen of having any guilty knowledge regarding the,
10 as alleged, falsity of statements that were made to the
11 NRC, and a complete lack of evidence of his specific
12 intent, his specific intent, no one else's, his specific
13 intent to deceive the Nuclear Regulatory Commission.

14 Now, there's no question the importance of a
15 clean head for inspection of the nozzles is an aspect in
16 maintaining a key component of a reactor vessel. It's
17 unremarkable that such knowledge be imputed to all
18 Davis-Besse personnel on the professional staff, anyway.
19 But this is a far cry from saying that that constitutes
20 evidence of willfully ignoring such knowledge and the
21 process of making the statements that they've been charged
22 with.

23 There is, in short, no evidence of a deliberate
24 and willful ignorance of a fact that -- that should have
25 been conveyed to the NRC. And there is absolutely no

1 intent, once again, on this record to suggest that
2 Mr. Geisen possessed the requisite specific intent to
3 deceive the NRC. The key to this analysis, Your Honor, is
4 not to confuse the feeling on the part of witnesses at the
5 NRC who, after the fact -- after the fact, when this cavity
6 was discovered, in hindsight and in retrospect, two words
7 that peppered their testimony, at that point felt deceived.
8 It's not whether they felt deceived, it's whether
9 Mr. Geisen possessed the requisite intent to deceive. And
10 we strongly suggest that that's just not present on this
11 record. I would make a distinction between Mr. Geisen's
12 belief in -- in that period in October before 2735, that
13 the information that he was parting to making or imparting
14 to the -- to the NRC was incorrect, and that he took those
15 steps to try and cure it. And his leadership said, yes,
16 let's get it cured in 2735. I -- I would distinguish that
17 as attempting to deal with incorrect information. It's
18 being characterized here as knowingly false and
19 intentionally made. And I suggest that that distinction
20 has to be appreciated here in terms of evaluating the
21 evidence, and in -- and in that context, there is no
22 evidence that -- that Mr. Geisen knew the information was
23 false and intended to convey it in that form.

24 The fact that more care might be attributed to
25 the behavior of Mr. Geisen, and that somehow he might be

1 perceived to have been negligent in not being more astute
2 in tracking the information that was being provided to him
3 does not translate into an intent to deceive. That's why
4 we pressed with witnesses on the issue of their hindsight
5 because it is not an adequate substitute for evidence of
6 this intent to deceive.

7 The cavity was a complete surprise to everyone,
8 and I think the evidence does support that proposition, and
9 it cannot be the reason behind why statements in the
10 serials are criminally false. So in short, it doesn't
11 prove the elements of this scheme that I speak of and which
12 is in count one.

13 Now, also in the recitals at paragraph 12, the
14 allegation is as follows, it's very significant to us,
15 quote, based on the information contained in the serial
16 letters, the NRC agreed to FENOC's proposal that it be
17 allowed to operate Davis-Besse beyond December 31st, 2001.
18 Now, this is what we were put on notice to defend. The
19 argument here is, or the allegation is that the NRC took
20 its action to permit Davis-Besse to stay open beyond
21 December 31st based on the information in the serial
22 letters.

23 In essence, the indictment reads that NRC's
24 reliance on the serial is in its decision not to shut down
25 Davis-Besse. Yet, there is evidence, Your Honor, in this

1 case, that everything that the NRC relied on before
2 November 20th, 2001, was not part of their determination
3 that Davis-Besse could stay open after December 31st, 2001.

4 The testimony of Dr. Sheron, the first witness at
5 page 53 of the transcript, he was asked this question, and
6 they're reading from Defendant's Exhibit 4, a letter that
7 Dr. Sheron's supervisor at the time, Sam Collins, assigned
8 to the director of operations, Mr. Traverse. And he was
9 asked -- Dr. Sheron was asked if he would read a letter
10 that -- part of the letter. And the letter read and he
11 read this sentence, quote, First Energy Nuclear Operating
12 Company has not provided sufficient information to justify
13 deferral of a nozzle inspections beyond December 31st,
14 2001.

15 Question that followed was, it is a fact, is it
16 not, that as of November 21st, the date of this memorandum,
17 the sentence you just read accurately stated the
18 conclusions that your staff had reached as a result of
19 their review of all of the information it received from
20 Davis-Besse up until that point. Isn't that the case?

21 And the answer that came back was, that's
22 correct. And so in short, that stands for the proposition
23 that nothing contained in the serial letters form the basis
24 of the decision to permit nothing in the serial letters
25 form the basis of the NRC's decision to permit Davis-Besse

1 to stay open after the 31st of December, 2001. What
2 transpired after November 21st, 2001, with an order that
3 had been drafted to shut down the facility was what they
4 determined in the NRC would form the basis upon which a
5 divided NRC would ultimately decide that they could stay
6 open. So taking the plea, the indictment as pled and on
7 which we've been placed on notice, the evidence does not
8 coincide with the allegations set forth in paragraph 12.

9 And, Your Honor, according to our reading,
10 there's nothing in this indictment in which Mr. Geisen is
11 charged with conduct after that point that constituted the
12 crime of making a false statement.

13 Now, within the framework of earlier argument and
14 ruling on the question of the multiplicitas of this
15 indictment, my recollection is that although it does not
16 appear in any signed order by The Court, when the arguments
17 were made, it was, I'll say understood, that -- that the
18 issue of multiplicitas would be reviewed generally against
19 the background of the proof that had come in.

20 Now, if I understand the government's position,
21 they're saying, look, it's an act of concealment that
22 separates count one, affirmative concealment that separates
23 count one from two, three, four and five. And so we, the
24 government, have to prove that act of concealment. And
25 here are 14 examples in our indictment that we identify and

1 we put you on notice constitute the acts of concealment.

2 Now, through the pleading process and the
3 arguments, the government recognized that there was, I
4 think what they called the potential for confusion, that --
5 yeah, some potential for confusion exists in that paragraph
6 6, 9, 10 and 11 of count 1 reference false statements
7 subsequently charged in counts 2 through 5.

8 We, of course, under the current rulings of the
9 case, have to deal with counts 2 through 5, but in the
10 context of count 1, I'll adopt the suggestion for purposes
11 of analysis that paragraph 6, 9, 10 and 11 need not be
12 addressed here when we are trying to ascertain the
13 sufficiency of evidence of affirmative concealment, not
14 casual or passive concealment but affirmative concealment.
15 That would take us down to approximately 10 out of 14
16 particular acts alleged.

17 In paragraph 2 of the indictment on page 6 of
18 count I, it speaks to the serial letter 2731, which was
19 filed with the NRC on the 4th of September. And the
20 affirmative concealments charged have to do with omissions
21 from the letter.

22 I harken back to the testimony of Praseon Goyal
23 who said under examination that Mr. Geisen had no
24 participation in the drafting of 2731. The only evidence
25 you have is the greensheet sign off, and that in and of

1 itself cannot constitute an act of concealment. And I want
2 to stress affirmative concealment. Paragraph three, the
3 allegation referencing the phone call of October 3rd, 2001.
4 There's no testimony from Dale Miller, who had virtually no
5 memory of anything unless he recognized his handwriting and
6 said, well, these are the notes I took. There's no
7 evidence on this record at this time from Mr. Miller, who
8 was the only person who testified on that subject from the
9 FENOC side of the phone call that Mr. Geisen said any of
10 the things that are contained in that -- in that notation.
11 And I would suggest to you that if you take a look at the
12 notation, it does not -- it does not prove beyond a
13 reasonable doubt that where Mr. Miller put Mr. Geisen's
14 initials, it meant that Mr. Geisen was speaking his -- his
15 own mind or whether he was reporting on information that
16 had been imparted to him by the vendor Framatome. And that
17 ambiguity cannot support a reasonable conclusion of
18 sufficiency, enough to give to this jury to deliberate on.

19 Paragraph 4, the meeting with the technical
20 assistants in Washington on October 11th. Well, if you
21 recall in that particular instance, Steve Moffitt gave
22 testimony. And the focus of the testimony in paragraph 4
23 had to do with language that appeared in the presentation
24 regarding the verification that penetrations were free from
25 popcorn using video recordings from 11 or 12, and there was

1 this testimony about the use of the word or.

2 Again, Your Honor, there is no evidence certainly
3 based upon the testimony of Mr. Moffitt who was present and
4 gave testimony concerning that, of any level of knowledge
5 or intent of the sort that fills up the elements or
6 complies or meets the elements of the crime of false
7 statement. And in this instance of an act of concealment
8 Mr. Moffitt testified, as I recall and I think you will
9 too, that the use of the word or was specifically designed
10 as to not mislead anybody into thinking that the viewing of
11 a video of 11 constituted a complete inventory of all the
12 nozzles inspected or -- or that the videos of 12 did the
13 same. And that the combination of the two, 11 and 12,
14 accomplished that result. That's why they use the word or.
15 I mean, there was some thought behind it. Mr. Moffitt
16 explained it, and I leave it to you to conclude that on
17 this record, giving full weight to the veracity of the
18 evidence for purposes of Rule 29, there's nothing in that
19 evidence that suggests guilt, knowledge or intent or the
20 affirmative -- affirmative act of concealment.

21 Paragraph 5 does not apply to Mr. Geisen. It
22 alleges as to Mr. Cook. Paragraph 6 is 2735. Now, that's
23 one of the paragraphs the government says you can get
24 confused here if you wanted to entertain it in count 1.

25 Let me reserve on that. I want to take that out

1 and accept that invitation for analytical purposes because
2 all they've done is served up 2735 and says here's another
3 example of affirmative concealment and then they go and
4 charge it in count 2. So for the moment, let's pass on
5 that and go to 7.

6 THE COURT: How many moments?

7 MR. HIBEY: Please?

8 THE COURT: How many moments?

9 MR. HIBEY: Well, 14 paragraphs. I can do this
10 more quickly by saying as follows, if you take --

11 THE COURT: I'm only saying this because we had
12 the jury come in at 9:00 and I was asked to reserve 45
13 minutes for argument.

14 MR. HIBEY: What am I doing, eating the whole
15 time? All right.

16 THE COURT: But we can -- we can go over, but I
17 want you to be aware of it.

18 MR. HIBEY: No, I appreciate that and I respect
19 the jury's time on this and the fact that you've given us
20 this opportunity.

21 THE COURT: That's fine.

22 MR. HIBEY: Your Honor, take out 2735. 2741,
23 2744 and 2745, now you're down to paragraph 12. And when
24 you take a look at 12, just quickly, the language there
25 that they're alleging as an act of concealment is a

1 meeting. And it's a meeting, they say, on November 14th of
2 2001, and you will recall that's the meeting that certainly
3 Mr. Hiser testified about in which Mr. Siemaszko said that
4 he had reviewed the head, and his inspection made him quite
5 convinced that everything was all right. And I asked him
6 if he remembered words like swearing on a stack of bibles
7 or whether he felt good in his soul, and I couldn't
8 remember precisely the language, but certainly it was
9 Mr. Siemaszko that did the talking and made the
10 presentation on that indictment, not Mr. Geisen. And then
11 in 13 -- on the next day, the 29th, this act simply was not
12 proved. It was not proved. It says here expressly relying
13 on false representations, that's -- I mean, that's a very
14 interesting formulation. It doesn't say expressing false
15 information. It says expressly relying on false
16 information, but that doesn't say whether Mr. Geisen knew
17 that the information he was relying on was false or that he
18 had the specific intent to deceive.

19 And then lastly paragraph 14, which is quite
20 remarkable because here you're talking about another
21 purported act of concealment, and it involves a meeting of
22 Mr. Geisen with the company nuclear review board. That is
23 with his employers, not with the United States Government.
24 So that cannot possibly be the act of concealment that
25 supports proof of the existence of a scheme to defraud the

1 United States through the use of false statements by
2 Mr. Geisen. The information, the sufficiency of the
3 evidence with respect to counts 2, 3, 4 and 5 rise to no
4 greater level.

5 In each instance, the question is what did this
6 man know and what did he intend, and there is no evidence
7 that at any time he knew that the information that he had
8 was incorrect, and that, by his knowledge of that, converts
9 it into false information which he then knowingly and
10 intentionally conveys to the NRC. So I am so sorry that I
11 have taken up as much time as I have.

12 THE COURT: If you need more, we'll just send
13 word up to the jury that we'll be late. This is more
14 important to both defendants and the government than a
15 delay with the jury.

16 MR. HIBEY: I appreciate that very much. I -- I
17 believe I've stated the position that, therefore, there is
18 no sufficient evidence here upon which a reasonable jury
19 could come to the conclusion in the case of count 1, that
20 David Geisen was enrolled in a scheme to, by trick and
21 artifice and device, to convey false statements knowingly
22 and intentionally to deceive the NRC, and that the
23 government's requirement and commitment to prove that he
24 concealed -- affirmatively concealed the truth through act
25 or omission, trick, artifice and device is simply not made

1 out on this evidence, and that a careful consideration of
2 each of the acts of concealment alleged simply wash out in
3 the face of the government's own proof.

4 And that with respect to counts 2, 3, 4 and 5,
5 the same obtains that there has never been proof elicited
6 that the incorrect evidence was, in his mind, false
7 evidence. And that in his mind, when he conveyed that
8 information, he had the specific intent to deceive the NRC.

9 So with that, Your Honor, we respectfully move
10 for judgment of acquittal on counts 1 through 5, and I
11 appreciate your indulgence.

12 THE COURT: Thank you.

13 MR. GORDON: May it please The Court on behalf of
14 Defendant, Rod Cook, we also move under Rule 29 that The
15 Court dismiss all five counts of the indictment on the --
16 for the reason that the government's proof does not prove
17 facts from which a reasonable finder of fact can find him
18 guilty of any of the things with which he's charged. I
19 will not repeat hopefully anything that Mr. Hibey said. I
20 join all of it on behalf of Rod Cook.

21 Let me say just a couple of things. Let me turn
22 briefly again to his argument about multiplicity and just
23 summarize I think where we are on that, and then I'll say a
24 couple things about the proofs and how they fail
25 specifically with regard to Mr. Cook.

1 And I will not be able to finish by 9:00. And I
2 apologize to the jury, but as you -- as Your Honor
3 recognizes, this is an important exercise. Mr. Hibey
4 alluded to the controversy we had earlier in the case over
5 whether or not counts 2 through 5 are multiplicitas of
6 count 1.

7 THE COURT: I don't want to interrupt you.

8 MR. GORDON: The formulation that I think we
9 established when we briefed that issue, and I believe
10 Magistrate Judge Armstrong accepted as an appropriate
11 formulation of the rule, is simply stated is as follows:
12 If count 1 requires proof of facts A and B, and count 2
13 requires proof of facts B and C, there is no multiplicity.
14 If count 2 requires only proof of fact B, which is also
15 proven in count 1, count 2 is multiplicitas of count 1.
16 That was the formulation. I think The Court accepted that
17 formulation. I believe the government accepted it. The
18 proofs are now in.

19 Count 1, as Mr. Hibey recited, asserts that the
20 scheme consisted in part of submission of the serial
21 letters. The serial letters are the only basis for counts
22 2 through 5. The proofs now establish, I think, that
23 they've proven no fact. C, if you will, to establish
24 counts 2 through 5, and I think under the formulation we
25 adopted, we urge earlier that that makes counts 2 through 5

1 multiplicitas.

2 The Government, Mr. Hibey reminded The Court,
3 when we were briefing this issue, suggested or volunteered
4 that that problem could be solved by striking from count 1
5 the allegations involving submission in the serial letters.
6 Mr. Hibey went through for you with respect to Mr. Geisen
7 what would be left of count 1. There's even less left of
8 count I with respect to Mr. Cook if that approach is taken.

9 Other than the serial letters, count 1 asserts a
10 phone call on October 3rd, probably suggests that Mr. Cook
11 participated in a phone call. There's no suggestion that
12 he said a word during that phone call. Count 1 also
13 asserts the meeting with the technical assistants.
14 Mr. Cook did not participate in that and he's not charged
15 with having had anything to do with that meeting.

16 Count 1 in paragraph 7 asserts the October 24th
17 public meeting in Washington with the NRC. Mr. Cook did
18 not participate in that. He's not charged with having
19 participated in it. And he's not, in fact, charged with
20 anything beyond submission of serial letter 2744 and 2745
21 in count 1. So if the serial letters are removed from that
22 count as multiplicitas, there is virtually nothing left in
23 count 1, that charges Mr. Cook with anything.

24 Now, with respect to counts 2 through 5, let me
25 just -- and I'll try to be brief with this. Let me just

1 summarize, and, again, I will adopt what Mr. Hibey said,
2 there's no evidence that Mr. Cook knew that anything in
3 those letters was false when he submitted them. There is
4 certainly no evidence that he planned with any other
5 defendant to conceal anything. There is no evidence indeed
6 that he did anything other than his job, which was to
7 collect information from the relevant technical
8 departments, in this case, engineering department, put it
9 into the form of an appropriate submission to the NRC,
10 circulate those drafts to everybody who needed to see them
11 and eventually resolve disputes.

12 There was testimony that he spoke to Mr. Goyal in
13 the furtherance of that objective. There was testimony
14 that he spoke to Mr. Siemaszko in the furtherance of that
15 objective and the e-mails. The e-mail track upon which the
16 government places such reliance shows that that's all he
17 was doing. He was preparing drafts, he was sending them
18 for comment to everybody who needed to see them making a
19 public record, or a record at least in the company's record
20 of all of those exchanges, gathering the information back,
21 using the information that he got to coin the serial
22 letters. That's all the proof shows that he did.

23 The Government, I think, attempts to show that
24 Mr. Cook knew some of those statements were false through a
25 couple of witnesses, principally Mr. Ulie. And let me just

1 hit a couple of the points that demonstrate that he did not
2 know that. With respect to whether or not the issue of
3 whether or not he saw the CRs, Mr. Ulie, before I cross
4 examined him, asserted Mr. Cook had admitted that he had
5 seen at least one of them. Mr. Goyal's testimony is
6 contrary to that, as is the testimony of Mr. Lloyd, whose
7 memory was less than stellar, but he remembered Cook
8 telling them that he hadn't seen those documents. So the
9 government's own witnesses are in conflict on that even if
10 you credit Mr. Ulie's summary.

11 The government also places substantial reliance
12 throughout the indictment on the claim that the statements
13 in the serial letters that the inspections had been
14 conducted in accordance with the boric acid control
15 procedure were false because, in the government's theory,
16 that procedure required that the head be completely
17 cleaned. That theory did not survive Mr. Lloyd. Both
18 Mr. Lloyd and Mr. Goyal recognized that the procedure, as
19 written and as understood in accordance with the procedure
20 writers guide, had no such requirement. The procedure, in
21 fact, left room for engineering judgments so that the
22 assertion that the very fact that the thing was not cleaned
23 proves a violation of procedure is simply not established.
24 In fact, the contrary is established.

25 Finally, the government would have The Court

1 believe that Mr. Cook admitted to having seen head
2 inspection videotapes before the last of the serial letters
3 was submitted. The reason that's important to them is
4 because he seen the 2000 tape before he submitted the
5 letters that he signed, he would have known what that tape,
6 in fact, showed. That's a way for them to try to
7 demonstrate that he had knowledge that a statement that he
8 made was false. I think it's clear after Mr. Ulie's
9 testimony was finished that he never made any such
10 admission. And in fact, what he readily acknowledged was
11 that he saw that tape on the day that it was shown in
12 Washington. That date is November the 8th, after the last
13 letter he submitted was filed. And the basis of
14 Mr. Ulie -- all of Mr. Ulie's testimony, I think no
15 reasonable finder of fact could conclude that Mr. Cook
16 admitted to seeing those tapes any earlier than that, and
17 other than Mr. Ulie's testimony, there is no evidence,
18 none, that he saw the tapes prior to November the 8th.

19 I have a much longer presentation, but I think I
20 will simply summarize by -- by joining Mr. Hibey's
21 conclusion that if you look -- if The Court looks at all
22 the evidence that the government's put in with reasonable
23 inferences drawn in favor of the government's testimony,
24 there is no evidence that Mr. Cook had a plan to conceal
25 anything. There is no evidence that he knew when he signed

1 those letters that any statements in them were false.
2 There is certainly no evidence that he had an intention at
3 any point to deceive the Nuclear Regulatory Commission.

4 And for those reasons, I would ask The Court to
5 dismiss all five counts against Mr. Cook. Thank you, Your
6 Honor.

7 THE COURT: Thank you, Mr. Gordon.
8 Mr. Ballantine?

9 MR. BALLANTINE: Good morning, Your Honor. May
10 it please The Court, and I say opposes both motions with
11 respect to both defendants.

12 I'd like to begin, Your Honor, by just talking
13 quickly about the evidence as to knowledge for both
14 defendants up until the time of 2731 was filed, as it's
15 been produced to the jury. I think that sets a good
16 baseline for what comes next. The evidence has gone in as
17 to Mr. Geisen. He was the managerial person who was most
18 knowledgeable about the nozzle cracking issue when it came
19 up in the winter and early spring of -- winter of 2000,
20 early spring of 2001. He presented it to outside visitors.
21 He presented it within the managerial team. He was
22 preparing for the NRC to ask questions about it. He signed
23 off on the justification for continued operation which was
24 clearly in anticipation of interaction with the NRC. And
25 what the defendants haven't spoken of is, as he was

1 interviewed by Jack Miller -- I'm sorry, Jack Martin,
2 someone after the cavity -- or one of the first persons to
3 arrive on site after the cavity was discovered, Defendant
4 Geisen told Mr. Martin that he had seen the videotapes in
5 August of 2001 in preparation for interaction with the NRC.
6 I think on the stand, Mr. Martin said that it was in
7 preparation for the bulletin responses and he was cross
8 examined about that because his notes said that in
9 preparation for interaction with the NRC. Either way,
10 there's no question that a bulletin and its responses are
11 interaction with the NRC. So he's looked at these videos,
12 and then the question becomes which videos? In the
13 October 3rd telephone call references made to video from
14 the 10th, 11 and 12th refueling outage and the testimony
15 there for Mr. Miller identifies who he was talking about
16 that from his notes, admittedly, but Mr. Hiser's testimony
17 is that somebody from the plant was saying 100 percent
18 inspection with the exception of five or six nozzles on the
19 top of the head and referring to videos going back to 1996,
20 to the 10th refueling outage. So the jury can conclude,
21 and a reasonable jury conclude beyond a reasonable doubt
22 that Defendant Geisen had seen the as-found inspection
23 videos prior to 2731 going out.

24 In addition, he had received an e-mail directed
25 to him from an engineer, subordinate engineer, Prasoon

1 Goyal, explaining what they were doing in -- in
2 preparation -- with respect to the bulletin response. In
3 one of those things, one of those action items was a plan
4 for -- to cut observation ports in the service structure in
5 the next upcoming refueling outage. And the reason that
6 Mr. Goyal gave that was to provide access for cleaning and
7 viewing the reactor vessel head. That reasonable jury
8 could conclude that Mr. Geisen would have known exactly
9 what that was about because it was a modification of the --
10 of the plan that had been proposed earlier and that had
11 been voided for this upcoming refueling outage by the
12 modification review committee that Mr. Geisen served on.

13 So going into 2731, that is some of what the jury
14 could conclude that David Geisen knew about the condition
15 of the head, and then he signed off on the greensheets
16 twice, once as the manager of designing engineering and the
17 second time as the technical director, the acting technical
18 director for Mr. Moffitt.

19 Now, the government has charged that document as
20 part of a scheme to conceal information from the Nuclear
21 Regulatory Commission. The jury has before it evidence of
22 what the 2000 inspection, the 1998 inspection and the 1996
23 inspection revealed about the past results of -- of looking
24 at nozzles at Davis-Besse. The 2000 inspection in
25 particular shows the camera digging into piles of boric

1 acid, you know, a head that just -- it is worthless for
2 inspecting the reactor vessel head. And the bulletin
3 specifically asks for that information. What was the
4 results of your past inspections, what was the acceptance
5 criteria and so forth. That information doesn't appear
6 anywhere in 2731 and David Geisen knew it.

7 Also with respect to -- just with respect to
8 knowledge of the boric acid corrosion control program,
9 there is evidence before the jury that David Geisen took
10 and passed an examination about the boric acid corrosion
11 control program that was required of every Davis-Besse
12 engineer. Mr. Cook was producing serial letter 2731, and
13 the jury has heard evidence of the responses he was getting
14 back from folks about what past inspections showed. In
15 particular, they've heard evidence from Prasoon Goyal
16 saying that inspection through the weep holes is an
17 impediment, both before Mr. Goyal signed off on the
18 bulletin, which he did after being visited by Mr. Cook, and
19 Mr. Siemaszko apparently, according to him, persuaded him
20 that it was an impediment. Subsequent to that, he sends
21 another e-mail to Mr. Cook saying it is an impediment and
22 managers need to know it. He also was engaged in
23 interactions with Andrew Siemaszko about the percentage of
24 the head that could be seen in the 2000 outage, and it went
25 up and down in a way that would make a responsible engineer

1 question whether or not the head could, in fact, be
2 inspected. Eventually, they got down to majority of the
3 nozzles, and as Dale Wuokko testified, he asked Rod Cook
4 the very -- the exact question that the NRC was asking,
5 what does it mean -- what does it mean that the head --
6 what does the majority of the nozzles mean? And as
7 Mr. Wuokko testified, he asked those questions, expected
8 that they would be resolved, and the jury has before it the
9 submittal that was sent to the NRC and can see that those
10 questions weren't resolved in the last video evidence, the
11 evidence from Mel Holmberg with respect to what those
12 inspections show. As to that, Mr. Wuokko had also
13 testified about the last review he did of that bulletin
14 response, which he explained to Mr. Cook was for typos
15 only, was during his training, and he was very upset, as I
16 think came across on the stand that he was signed off on by
17 Mr. Cook, per Telcon, on the greensheet.

18 So as to both of them -- oh, and then as to the
19 Boric Acid Corrosion Control Program prior to 2731 going
20 in, Mr. Cook was told specifically by Mr. Goyal and
21 Mr. Siemaszko that Davis-Besse was not in compliance with
22 Boric Acid Corrosion Control Program, and that's his own
23 statement as we've heard from Ronald Lloyd. That's the
24 state -- a sample of the state of knowledge that the jury
25 has before it before September 4th when bulletin 2731 goes

1 in. It just gets worse from there in terms of knowledge.
2 As time goes on, the defendants get more information.

3 There's Greg Gibb's testimony about his helping
4 them prepare for the 13th refueling outage when he says
5 that access to the weep holes is severely restricted. That
6 goes to Defendant Geisen. There's preparation in, for
7 serial letter 274I, Defendant Cook prepares a statement for
8 one of the questions that addresses these very issues more
9 accurately than what ends up in the serial letters, so
10 demonstrating that Mr. Cook knew what the actual situation
11 was if you couldn't inspect because of the preexisting
12 boric acid deposits, but then that got taken out.

13 So the evidence of knowledge gets worse for the
14 defendants over time. But as of 2731 when the scheme to
15 conceal began, and the scheme to conceal is to conceal the
16 information about the condition of the head as found in
17 2000. That's where this evidence stands.

18 So with that as background, I'd like to address
19 first Mr. Hibey's arguments. First is that the government
20 has alleged a single scheme among these defendants. The
21 government has alleged a scheme to conceal. It's not a
22 conspiracy as the defendants have been pointed out from
23 time to time in the past. Now they're arguing it as though
24 it is, as though we need to prove agreement among these two
25 defendants in order to show that they each had a plan to

1 deceive the NRC. And I'd like to articulate what -- what
2 the government believes the elements of the scheme to
3 conceal -- a particular element of the scheme to conceal
4 is.

5 We've submitted to The Court proposed jury
6 instructions, and it defines a scheme or device to include
7 any plan or course of action intended to deceive others.
8 That's from the Seventh Circuit pattern instructions.
9 There's no Sixth Circuit pattern instructions defining this
10 crime. I think that that's -- a reasonable jury could
11 conclude that's exactly what was going on here. The plan
12 was to keep back from the NRC information about the past
13 inspections by giving them other information, information
14 that wasn't asked for about flange leakage, information
15 about cleaning the head in a question about past
16 inspections.

17 As to specific intent, of course, The Court will
18 be instructing the jury that we cannot get inside a
19 defendant's mind, and that intent can be inferred from
20 their other actions. The jury has heard evidence of how
21 important it is to operate the plant, what the costs are of
22 shutting it down. But this was information that Mr. Geisen
23 knew. And in light of that, and in light of the evidence
24 that he had of what the past inspections were, they can
25 conclude -- that a reasonable jury can conclude beyond a

1 reasonable doubt that he wanted to keep that information
2 from the NRC to avoid those consequences.

3 As to the pieces of evidence that -- that
4 Mr. Geisen -- Mr. Hibey pointed to directly, there is -- he
5 pointed to evidence that Prasoon Goyal told the jury that
6 Davis Geisen was not involved in drafting 2731. And then
7 he said, I think this is telling, that 2731 is countable.
8 Well, that's just not the case. The concealment scheme is
9 charged as spanning the period of 2731's being sent to the
10 NRC through February of 2002. And it undertakes that they
11 were keeping information, relevant information from the
12 NRC, material information from the NRC throughout that
13 period.

14 He also talked about Mr. Moffitt's testimony
15 about his correcting information that was produced to the
16 NRC. Interestingly, Mr. Moffitt, the correction such as it
17 was to submit 2735, a document that does not -- does not
18 show what the actual results were of the 2000 inspection,
19 and that's emphasized even more by the submittal of 2744,
20 which is the document that includes all the photographs,
21 and those photographs of the head in 2000 have one picture
22 in it that indicate that in the background it is
23 representative of a condition of the rest of the head. The
24 jury has seen video from that inspection showing that the
25 condition of the rest of the head was such that you

1 couldn't even get a camera through the weep holes. A
2 reasonable jury could conclude that in -- in saying that,
3 in writing that caption which Mr. Geisen has conceded
4 through -- through Mr. Ulie conceded that he did, that he
5 was keeping back the truth of what that inspection was
6 like, that the actual inspection of that head was much
7 worse. And I will get to the issue of materiality in a
8 moment. But it had the capacity to affect the NRC's
9 decisions.

10 The third example that Mr. Hibey cited was about
11 the knowledge that Defendant Geisen had, and he
12 indicated -- Mr. Hibey indicated that Mr. Ulie's testimony
13 showed that Defendant Geisen got that knowledge after the
14 fact. He didn't talk about Jack Martin's testimony which
15 establishes directly that Defendant Geisen looked at these
16 videos in August of 2001 in preparation for interacting
17 with the NRC on this issue.

18 The next issue I'd like to address is the issue
19 of materiality. Mr. Hibey gets into paragraph 12 of the
20 introduction section of the indictment. That is in the
21 introduction section -- introductory language of the
22 indictment. In each of the counts, the government has
23 charged that the concealment in each of the false
24 statements involve material statements. And I'm sure The
25 Court is familiar with the definition of materiality, but

1 it's any information that has the -- the potential to
2 affect the government decision.

3 I think there's ample evidence that a reasonable
4 jury could apply to this case to conclude that had the 2000
5 inspection video been shown to the NRC, had pictures that
6 were representative of the actual conditions on this head
7 been shown to the NRC, the decision about this case would
8 have been very different, and certainly, that at least had
9 the possibility of impacting that decision.

10 Indeed, Allen Hizer testified that he needed more
11 ammunition, he was looking for more facts to argue his
12 position which was that Davis-Besse should shut down.
13 Mr. Hibey emphasized that -- that he emphasized with
14 witnesses on the stand that their feeling of being deceived
15 was something that happened only in hindsight. Well, if
16 they had been deceived, if they were deceived, you wouldn't
17 expect them to have that feeling at the time.

18 I also, with respect to that paragraph 12, would
19 point out that that was the very issue that Alan Hizer was
20 getting into when we were talking about the probabilistic
21 safety assessment and the core damage frequency issue
22 which, you know, we didn't get into because we didn't want
23 to over -- the defendant has objected to getting into that
24 in any kind of depth, but that is -- that probabilistic
25 safety assessment was one of the factors that the NRC

1 applied in making that decision, and that safety
2 assessment, as the jury will know when they look at serial
3 letter 2745, is explicitly based on the false notion that
4 the 2000 inspection encompassed the entire head with the
5 exception of four nozzles at the top which they claimed
6 wouldn't open up, wouldn't have a sufficient gap to allow
7 leakage to show up.

8 The defendant's argument, Mr. Hibey's in
9 particular, goes back into the issue of multiplicity,
10 which, you know, The Court has addressed before. I don't
11 intend to reargue that here except to say that it is
12 certainly the case that a scheme to conceal could require
13 lies down the road. If you want to keep back from the
14 government organization the fact of the -- the
15 inspections -- that these inspections were bad in the past,
16 that they were nearly worthless for the intended purpose,
17 and the NRC asks more questions, you may have to lie in
18 order to keep that information from going out to the NRC.
19 The truth may cause the NRC to ask more questions and
20 eventually pry out the information about the 2000
21 inspection, the 1998 inspection, the inadequacy of those
22 inspection which were kept back in serial letter 2731 and
23 throughout the serial letters.

24 With respect to paragraph 13 that Mr. Hibey
25 focused on, there is evidence before the jury of Exhibit

1 118 that gets into, again, this probabilistic safety
2 assessment. It's a document that relies on the idea that
3 the 1996 inspection was 100 percent inspection. Again,
4 with the exception of four nozzles, which at the time, I
5 believe there's evidence that Mr. Geisen had learned would,
6 in fact, show that.

7 And finally, with respect to paragraph 14, the
8 scheme to conceal, the plan to keep information from the
9 NRC would fall apart if the company's Nuclear Review Board
10 learned that -- learned the information that the NRC was
11 wanting the CNRB, I think it is a reasonable conclusion
12 would not be comfortable allowing the plant to continue to
13 operate for the same reason the NRC would have been
14 uncomfortable for allowing the plant to continue to operate
15 had they known the truth of the past inspections, which is
16 what paragraph 14 of count 1 addresses.

17 With respect to Mr. Cook, Mr. Gordon indicated
18 that Mr. Cook was just doing his job, that he was
19 collecting information, making an open record of the
20 exchange and the edits that he was making to these
21 documents throughout. The exchange with Mr. Wuokko was not
22 something that was e-mailed back and forth. Mr. Wuokko
23 provided Mr. Cook with written comments. And those
24 comments asked the precise questions that are at issue,
25 particularly with respect to concealment scheme in this

1 case. They asked what is it that, you know, you have an
2 answer -- if I can sum up Mr. Wuokko's comments, you
3 haven't answered the questions the NRC is asking. Why not?
4 We need to resolve this before we send a document that is
5 required to be complete and accurate to the Nuclear
6 Regulatory Commission. And as a consequence of
7 Mr. Wuokko's comments, nothing happened.

8 In addition, Mr. Cook drafted responses to serial
9 letter 2741 that, as I said before, contained information
10 that was more truthful than what went in. He was involved
11 in drafts of 2731 that initially said that there were --
12 that there were -- that inspection through the weep holes
13 creates an impediment that the -- cleaning through the weep
14 holes was done -- I'm not going to get the quote exactly
15 right, but language indicating that inspection through the
16 weep holes was an impediment, and then that was taken out,
17 the impediment to pass inspections between the drafts, that
18 was taken out by Mr. Cook.

19 As I mentioned before, Ron Lloyd testified that
20 both Andrew Siemaszko and Prasoon Goyal told Mr. Cook,
21 according Mr. Cook's statement to Mr. Lloyd, that the past
22 inspections were not in accordance with boric acid
23 corrosion control program. And he told Mr. Lloyd that he
24 had seen the video in October. He told Mr. Ulie that he
25 saw it on October 24th, about the time that they were

1 preparing to send video to the NRC, the time that they were
2 converting videotapes to electronic files. There is in
3 evidence a slide that Mr. Geisen presented indicating that
4 that conversion had taken place by October 24th.
5 Mr. Geisen presented slides to the NRC saying that one of
6 the things that they were doing in reviewing these
7 documents or these videos was to turn them into a video
8 format, an AVI format to do a frame-by-frame review. That
9 slide was presented to the NRC on October 24th, and
10 Mr. Houston testified that the NRC was -- I believe he
11 testified the NRC was anxious about not having seen the
12 videos at the October 24th meeting. Also Mr. Ulie
13 testified that the properties of the electronic files of
14 the video records that -- that he had collected from FENOC,
15 showed a creation date of early September. I'm sorry, yes,
16 early September. I want to get this right, but I believe
17 early September of 2001.

18 The defendants haven't argued the other elements
19 of the -- of the case, the falsity. In particular and with
20 respect to the -- the serial letter 2735, 2741, 2744 and
21 2745, those documents are before the jury, as are the
22 underlying records, the video records and reports, like
23 condition report 96551 in attempts of determining a
24 falsity. They can assess that for themselves, and a
25 reasonable jury could conclude beyond a reasonable doubt

1 that those documents are false. The evidence of knowledge
2 as to those submittals is the same evidence of knowledge
3 that I've already spoken to.

4 With that, Your Honor, I'd submit to The Court
5 that a Rule 29 motion for a judgment of acquittal is not
6 appropriate at this time, that this is a case that should
7 go to the jury, that the government has born its burden as
8 to every element of every crime charged, and would invite
9 any questions that The Court has at this time.

10 THE COURT: Rule 29 is an unusual rule in
11 criminal cases and is different from but yet similar to the
12 rule of judgment in a civil case after the close of the
13 plaintiff's case.

14 In this case -- and I've listened carefully to
15 arguments, which I anticipated, because of the quality of
16 the attorneys in this case, would be excellent, and they
17 were.

18 It comes to mind that we, as judges, must keep in
19 mind that clause from which a reasonable jury could
20 conclude. Clearly in many cases, if not most, is there
21 direct evidence of a crime as to all aspects of the
22 underlying crime which must be proven beyond a reasonable
23 doubt. But that is why we, as judges, charge the jury on
24 circumstantial evidence and their right to take from facts
25 proved to their satisfaction beyond a reasonable doubt.

1 Reasonable inferences that other facts did or do exist.
2 And that's what we have here in the making is this
3 opposition to Rule 29 favorable decision by The Court for
4 the defendants a slam dunk, so to speak, by the government.
5 Far from it.

6 But in taking all of it into consideration at
7 this juncture, as I must, I will deny the motion without
8 prejudice of it renewal at a later time, either at the
9 close of the case or thereafter as contemplated by Rule 29.
10 And I will continue to research the issues which have been
11 raised by both Defendants Geisen and Cook through able
12 counsel and compare them with what we all heard, which has
13 been presented to the jury. Under the magnifying glass,
14 again, of what could a reasonable jury conclude with the
15 standard as in mind beyond a reasonable doubt. Let's take
16 a few minute's break and then we'll call the jury.

17 MR. GORDON: Your Honor, before you go off the
18 record, may I correct a misstatement that I think I made.
19 And I believe I asked you to dismiss all five counts
20 against Mr. Cook. As you know, Mr. Cook was only in four
21 counts.

22 THE COURT: I understand.

23 (A brief recess was taken.)

24 MR. BALLANTINE: Your Honor, during my argument,
25 I had indicated that Mr. Ulie had said that there were

1 properties on a CD that he had examined that showed it had
2 been created and I think I said early September. And his
3 daily transcript on page 31 is that it was around
4 September 27th, early October.

5 THE COURT: Very good. Ladies and gentlemen, I
6 will ask all users of the courtroom going in and out to do
7 what this lady in the white blouse just did, hold the door
8 like you did so that it doesn't disturb the witnesses, the
9 attorneys or the jury. It's an old courtroom and the swing
10 doors make noise and are distracting. I'd appreciate it if
11 you'd remember it. I know there'll be slips. Thank you.
12 Ready for the jury?

13 MR. WISE: Yes.

14 (The jury has entered the courtroom.)

15 THE COURT: Ladies and gentlemen, my apology for
16 keeping you waiting and being enticed by the food in the
17 jury room, but it was unavoidable, and we will explain that
18 at some later time. Hope you all had a nice break and
19 relaxing and stayed out of the wet.

20 Defense ready to call their first witness?

21 MR. WISE: Yes, Your Honor. Defense calls Mark
22 McLaughlin, Your Honor.

23 THE COURT: Mr. McLaughlin, you have previously
24 been sworn, and as I explained to you, you remain under
25 oath.

1 MR. WISE: Good morning, sir.

2 DIRECT EXAMINATION

3 BY MR. WISE:

4 Q. Can you explain to the jury where you presently
5 work?

6 A. I work for Areva. I just want to say a little
7 bit. You may hear Framatome, the company, and Areva.
8 Framatome -- we changed the name of Framatome about three
9 years ago to Areva. So I work for Areva in Lynchburg,
10 Virginia.

11 Q. And how long have you worked there?

12 A. Five years.

13 Q. Did you work at Davis-Besse between the years of
14 2000 and 2002?

15 A. I did.

16 Q. And can you tell the jury what your position at
17 Davis-Besse was in 2000 at the time of the 12th refueling
18 outage at Davis-Besse?

19 A. Okay. My position was fix it now team
20 supervisor. At nuclear power plants, they have what -- I
21 guess it would be called a quick maintenance group. And it
22 was multi-disciplined maintenance groups, so if there was
23 easy things to fix like light bulbs out or some real easy
24 things we could fix within eight to ten hours, we would do
25 that. So I was the supervisor of that group.

1 Q. Did there come a time that you were reassigned
2 to, for lack of a better word, babysit Framatome?

3 A. Yeah, there was. You're talking about at the
4 beginning of the 12 RFO?

5 Q. Yes.

6 A. The beginning of 12 RFO. I was the fix it now
7 team supervisor, and it's kind of humorous because we
8 were -- we spent the first week of the outage working on
9 the stupid water heater and everyone was complaining about
10 it because they couldn't take a shower before they left the
11 plant after the shift. Kind of embarrassing that you can't
12 even fix a hot water heater. But after about -- we finally
13 did get that fixed. So after about seven or eight days
14 into the outage, the things had not been going well with
15 the head disassembly, and that scope of work was
16 Framatome's. So I was approached by the vice president of
17 Davis-Besse at the time, and he asked if I would come and
18 help babysit or facilitate Framatome in getting the head
19 project back on track. And so I agreed to do that as long
20 as my fix it now team supervisor duties were ended.

21 Q. In your role facilitating Framatome, did you
22 observe flange inspections during 12 RFO?

23 A. No, because I think flange inspections would have
24 been done already.

25 Q. Okay. As the plant came out of the 12 RFO, did

1 you have an opinion or did you have a sense of whether the
2 reactor vessel head had been cleaned?

3 A. Yes, I -- I felt that it was cleaned, and that
4 was based on an article in the -- I always forget what it
5 was called, I think it was the online -- Davis-Besse had
6 like a daily newsletter that they would send out to all
7 their employees just giving updates on the outage. And
8 there was an article in that that talked about an
9 individual who had persevered and had cleaned the reactor
10 vessel head.

11 Q. Is that the outage inside that you're referring
12 to?

13 A. That sounds right, yeah.

14 Q. And by cleaned, was it your understanding that
15 all of the boric acid had been removed from the reactor
16 vessel head?

17 A. That was my understanding.

18 Q. Now, did you, at some point, become involved in
19 the plant preparations for the 13th refueling outage?

20 A. I did.

21 Q. And when was that that you became involved in
22 that process?

23 A. There was actually two times. The first time
24 was -- let's see. The outage was in 2000. Probably late
25 2000, I was asked to be the project manager for the reactor

1 vessel head disassembly reassembly, essentially the same
2 thing I had just been a Framatome babysitter for. And then
3 later on the -- one of the directors came to me and asked
4 me to be the project manager for getting the plant ready to
5 do a head inspection and repairs if necessary.

6 Q. Okay. The time that you became involved in the
7 preparations for head inspections and repair, was that
8 after the bulletin 2001-01 had been issued?

9 A. Yeah. It was in mid -- well, it was in mid
10 August when it became --

11 Q. And in that role, did you have -- did you
12 participate in the plant's responses to the bulletin?

13 A. I did.

14 Q. Did you participate in the drafting of 2731,
15 which was the first bulletin response?

16 A. I did participate in the first -- drafting the
17 first letter.

18 Q. And can you tell the jury what your role was in
19 connection with 2731?

20 A. My role in -- for that first letter was twofold
21 one I had acquired drawings of the reactor vessel head and
22 service structure, et cetera, over the years, and so I said
23 that I would provide the details of the structure itself
24 because that was one of the things that the bulletin asked
25 for. The other thing that I did is I was responsible -- of

1 course, I was project manager for 13 RFO inspections, I was
2 responsible for the section that would tell the NRC what
3 inspections we would do during our next refueling outage.

4 Q. Did you have any connection with David Geisen in
5 connection with a drafting of the sections of 2731?

6 A. I don't really remember a whole lot of
7 connection. I'm sure we did because it was a team effort,
8 but that first letter, I don't remember too -- too much
9 interaction.

10 Q. Okay. Was there a time that you came to know
11 that the head had not, in fact, been entirely cleaned
12 coming out of 12 RFO?

13 A. Yeah, sometime after we sent the first letter to
14 the NRC.

15 Q. Do you recall how you came to know that?

16 A. No, I don't.

17 Q. Do you recall dealing with a gentleman named
18 Gregory Gibbs?

19 A. Yeah, I remember Greg Gibbs.

20 Q. And who was Greg Gibbs?

21 A. Greg Gibbs was a person, since I was new to run a
22 big project like this -- Steve Moffitt had known Greg Gibbs
23 had worked -- he was a past employee at Davis-Besse. So
24 Steve Moffitt wanted to bring in Greg to just take an
25 overview of the project and see if there were any

1 suggestions that Greg could give to me to help the project
2 get started on the right foot.

3 Q. Do you recall receiving a letter or a report from
4 Mr. Gibbs?

5 A. Yeah, Mr. Gibbs and I sat down before he left the
6 plant and we went over some recommendations. He did -- I
7 did get a follow up letter later. The two things that I
8 remember coming out of the discussions with Greg and the
9 letter were, number one, he recommended that I clearly
10 define the roles and responsibilities of the team members,
11 and so I did that. And the second thing he said was that
12 there was disagreement on the team as far as what holes to
13 cut in the service structure.

14 Q. Let's talk for a second about the cutting holes
15 in the service structure. Was this something that you
16 understood to be a potential step in preparation for the
17 next refueling outage?

18 A. Yes. The problem at that time during September
19 and October with the cutting of the holes was that the
20 repair method that Framatome had, at the time, required you
21 to put heat blankets on the head. You had to preheat the
22 head before you could do -- in order to do heat blankets on
23 the head, you had to have like 48-inch long openings.

24 Now, a couple of the other people on the team,
25 Andrew Siemaszko and Prasoon, wanted round holes and

1 several of them around the head to aide in inspection. You
2 could do one or you could do the other, but you couldn't do
3 both. So during that September, October time frame, it was
4 really up in the air with what openings we could put in the
5 service structure.

6 Q. Had you, at that point, begun to make
7 arrangements through some other method of performing the
8 inspections in 13 RFO?

9 A. Yeah, we did.

10 Q. And what -- what did those entail?

11 A. I had contracted with Framatome at the time, and
12 Framatome had a robotic crawler that could go up through
13 the mouse holes and look at the key area, to look at from a
14 visual standpoint was right around the nozzle in that area,
15 and the robotic crawler that they had was capable of going
16 up there up to the head and taking a look at that annulus
17 area all the way around.

18 Q. And had that been used at plants similarly
19 designed -- similarly constructed to Davis-Besse, excuse
20 me?

21 A. Yeah. It had been used at Arkansas in the
22 spring.

23 Q. You said that you got a report from Mr. Gibbs and
24 also spoke with him?

25 A. Yeah, before he left the site, he and I sat down

1 and had a -- I guess I'd call it an exit meeting, and he
2 gave me the recommendations, and then he followed up with a
3 letter.

4 Q. Did he tell you, either in that meeting or in the
5 letter, that you needed to be concerned because there were
6 false or misleading statements in 2731?

7 A. No, I don't recall anything -- any discussions
8 about that.

9 Q. Would you recall that type of statement if he had
10 made it to you?

11 A. I would think that I would have, yeah, but it
12 would have been concerning to me.

13 Q. Were you also involved in dealing with Structural
14 Integrity Associates on the interference fit issue?

15 A. I was. I hired them to form a study for us.

16 Q. And what was the point of the study?

17 A. The bulletin -- in order to do what they call a
18 qualified visual inspection using the crawler or some other
19 means required you to prove that -- that -- the gap between
20 the head and the nozzles would open up, because if it
21 didn't open up enough then you wouldn't be able to see the
22 boron, the popcorn boron. So Structural Integrity
23 Associates had done that for another plant I don't remember
24 which one, maybe Arkansas. So we hired them because they
25 had the methodology and the model so that's what they did

1 for us.

2 Q. Okay. And just in general terms, what would it
3 mean for the quality -- for your ability to present
4 information about an inspection if a gap would not open up
5 around a nozzle?

6 A. You wouldn't be able to call it a qualified
7 visual inspection for the future.

8 Q. And why is that?

9 A. Because if you couldn't prove that those gaps
10 open, then the theory was if you had a crack in the nozzle,
11 the -- it would leak through the nozzle -- nozzle and when
12 the head cooled down then. So there would be a little bit
13 of boron in that gap. When the head cooled down, they
14 would squeeze that interference back together and it would
15 push the boron up and out. That's how -- it's -- if you --
16 you would not be able -- the theory was you wouldn't be
17 able to see the boron if that gap wouldn't open up.

18 Q. Assume for a second hypothetically that you could
19 see around the nozzle and it was entirely clean, but you
20 learned that the gap would not open up, could you credit
21 that nozzle as an okay nozzle?

22 A. You could not.

23 Q. Do you recall whether Structural Integrity
24 Associates was able to come quickly to a give an opinion or
25 whether their opinion changed over the months that you

1 worked with them?

2 A. The first calculation they performed, they sent
3 it to me and it showed four nozzles at the top of the head
4 that would not open. So I had asked them to go back and
5 see if they had some conservative advertisement in their
6 calculation, if they could remove that conservative
7 advertisement. And that showed that all four or all the
8 nozzles on the head would open up, and they did that. So
9 there was a revision, one, to the calculation that showed
10 up the nozzles would show leakage.

11 Q. Do you recall whether that revision was their
12 final word or whether they came back with a different
13 opinion even after that time?

14 A. That's the last I remember information getting
15 from them.

16 Q. Okay. When you were here last week, Mr. Stickan
17 showed you an e-mail from November 15th that was sent along
18 to Mr. Lockwood and Mr. Geisen. Do you remember that
19 e-mail?

20 A. Yes, I do.

21 Q. Do you recall the discussion about whether or not
22 to patch that information along to the NRC?

23 A. I remember that we talked about whether we should
24 introduce this new information. The probabilistic risk
25 assessment had already been performed at that point and it

1 used what I would say is a worse case that showed those
2 four nozzles, you could not inspect those in the past. So
3 we felt that if we -- if we use the knowledge that all the
4 nozzles would show leakage, they would actually make the
5 case for Davis-Besse better. So we took the conservative
6 approach and decided not to introduce the fact that the
7 nozzles would open up.

8 Q. And whose call would that have been as to whether
9 to pass that information along?

10 A. You know, I don't remember whether it was a
11 collective decision or what.

12 Q. Okay.

13 A. I mean, I would have probably -- the main guy I
14 trusted would have been Dave Lockwood because he was the
15 head of licensing.

16 Q. And what department was he in?

17 A. Licensing department. So he was the one that
18 would interface with the NRC the most.

19 Q. Okay. Let me take you back to the beginning of
20 October of 2001. Did you have any role in getting
21 videotapes of the past head inspections converted to
22 digital format for Mr. Siemaszko's use?

23 A. Okay. So I don't remember when Dr. Sheron called
24 us, but after Dr. Sheron called Davis-Besse, we had a
25 meeting. It was fairly clear that we would need the

1 results of the videotapes and be able to show them to
2 people. So I did go and search for the videotapes.

3 Q. Where did you search for them?

4 A. Well, I had searched for them earlier. I knew
5 some places where we had put things from -- you know,
6 inspection tapes from past outages. I had gone and looked
7 at those places. I relooked at those places, didn't find
8 them. Just happened to see if Andrew had them. Andrew
9 Siemaszko had them, and I ultimately located them at his
10 desk. And he had -- I kind of remember that because he had
11 them mixed in with some personal tapes, and none of the
12 tapes were marked, so he said he needed to go through the
13 VHS and view all the tapes, so that took about a week or
14 so.

15 Q. Okay. Did you have any role in sitting with
16 Andrew and constructing the nozzle-by-nozzle chart?

17 A. I did not.

18 Q. Did Mr. Geisen ever tell you that he had watched
19 the videos at any point?

20 A. I don't remember him ever saying that.

21 Q. What was Mr. Geisen's position within the plant
22 at the time?

23 A. He was the design engineering manager.

24 Q. Would you have expected a manager to watch the
25 videos for this project?

1 MR. STICKAN: Objection.

2 A. He wouldn't have enough time.

3 THE COURT: Overruled.

4 BY MR. WISE:

5 Q. Based on your work with Mr. Geisen,
6 Mr. McLaughlin, did you have an opinion about Mr. Geisen's
7 integrity?

8 A. I would have trusted Dave.

9 Q. Very well. That's all I have. Thank you.

10 MR. CONROY: Nothing, Your Honor.

11 THE COURT: Mr. Stickan, cross?

12 CROSS EXAMINATION

13 BY MR. STICKAN:

14 Q. Good morning, Mr. McLaughlin.

15 A. Good morning.

16 Q. Okay. Mr. McLaughlin, do you remember telling
17 Mr. Wise about your role in the submissions that were being
18 sent to the NRC by FENOC, do you remember?

19 A. Mr. who?

20 Q. He asked you that question, what your role was?

21 A. Mr. who?

22 Q. Wise.

23 A. I don't remember who Mr. Wise is.

24 Q. He was the attorney who was asking you the
25 questions before I got up.

1 A. Oh, I'm sorry.

2 THE COURT: How soon we forget.

3 A. I was thinking in the past.

4 Q. How good is your memory?

5 A. Can you repeat the question? I'm still thinking
6 back to 2001, 2002.

7 Q. Okay. Well, let's try to come to the future or
8 present.

9 A. Got it.

10 Q. Do you remember Mr. Wise asking you what your
11 role was in responding in the submissions to the NRC?

12 A. I do.

13 Q. And you said that you had drawings to -- to
14 submit in that, correct?

15 A. I had drawings of the service structure at my
16 desk.

17 Q. And you also had an assignment to do, right, a --
18 the bulletin itself had different sections to it that had
19 to be responded to, correct?

20 A. That's correct.

21 Q. And you had certain sections you had to respond
22 to; isn't that correct?

23 A. That's correct.

24 Q. And other people had other sections that they had
25 to respond to, right?

1 A. Correct.

2 Q. Okay. In fact, your responsibility, excuse me
3 while I wade through my tabs here, was such that you had an
4 overall role that you were there to look at these letters
5 and to ensure that you didn't do something that was just
6 not right? Wasn't that your role?

7 A. No.

8 Q. Do you remember having an interview with
9 Mr. Rossomme, do you remember?

10 A. Rossomee?

11 Q. Yeah. And at the time he asked you who was
12 responsible for the development and how was this
13 coordinated? He was talking about 2731. And didn't you
14 indicate, I think I was just there to do an overall look at
15 all these things -- all these letters to ensure that
16 they -- we just didn't do something that -- that just --
17 that was just not right?

18 A. That's what I would have felt my role was for the
19 first letter.

20 Q. Okay. Do you remember whether you told
21 Mr. Rossomme that or not?

22 A. No, I don't.

23 MR. STICKAN: Okay. I think it's been marked
24 already. May I approach the witness, Your Honor?

25 THE COURT: Of course.

1 MR. WISE: Can I hear what is being --

2 MR. STICKAN: Exhibit 95.

3 THE COURT: 95?

4 MR. STICKAN: Yes, Your Honor.

5 THE COURT: I'll defer ruling on the objection.

6 MR. STICKAN: Okay.

7 BY MR. STICKAN:

8 Q. Mr. McLaughlin, I think you indicated that --
9 well, let me ask you this: In fact, your role as part of
10 the I guess team or the group of people that were reviewing
11 these and signing off on these submissions, you had a
12 chance to look at the entire submission, correct?

13 A. That's correct.

14 Q. Okay. And in fact, you did pay some attention to
15 section 1.D, for example?

16 A. What section is that?

17 Q. That would be the section dealing with past
18 inspections.

19 A. I might have paid some attention to it, but I
20 wouldn't have been able to answer that question.

21 Q. In fact, you offered some comments about that,
22 didn't you?

23 A. I know that I talked to one individual and said I
24 don't care what that section says as long as it's correct.

25 Q. Okay. Remember making handwritten notes on

1 drafts of 2731 -- excuse me, 2735?

2 A. Is that the second letter?

3 Q. Yes.

4 A. I'm sure that I made some comments on it. I
5 don't know. I'd have to see.

6 Q. Okay.

7 MR. STICKAN: May I approach the witness, Your
8 Honor?

9 THE COURT: Yes.

10 BY MR. STICKAN:

11 Q. Let me show you what's marked as Exhibit 95.

12 MR. WISE: Your Honor, can we approach while
13 Mr. McLaughlin looks at the exhibit?

14 (A side bar conference was had on the
15 record.)

16 MR. WISE: Judge, my objection is that this is
17 outside the scope of the direct. The direct was only about
18 a couple specific topics as they related to his
19 interactions with Mr. Geisen. Government had this witness
20 in this courtroom last week on direct and chose to ask him
21 one question and then made him come back today to be
22 examined in the defense case. To now do a cross
23 examination that's outside the scope of a very limited
24 direct is improper.

25 THE COURT: I -- I wanted to know what this

1 exhibit had to do with anything that was questioned about
2 on direct. And that's why I reserved. Tell me what this
3 possibly has to do with direct.

4 MR. STICKAN: Your Honor, first of all, I wanted
5 to establish that this witness did have a role in
6 commenting on some of these letters that went to the NRC.
7 He was not just limited to a specific area.

8 Secondly, he's already indicated and denied with
9 respect to my question what his role was. And I asked him
10 about a statement that he made to Mr. Rossomme, and he
11 denied that that was his role. He told Rossomme he -- he
12 told Rossomme that he had an overall role to play in
13 reviewing the submissions that would be all the submissions
14 and that it was his role to make sure things were right.
15 I'm paraphrasing, but basically make sure that they were
16 saying things correctly or that they were right. And he,
17 you know, indicated that that was not his role. So now I
18 have an exhibit up there that shows that he actually was
19 making comments with respect to 2735 with respect to
20 language that he was questioning. And in fact, bringing
21 that to the attention of Mr. -- well, I don't know, I
22 assume that he brought to the attention Plaintiff Geisen --
23 I can ask him that but there's a reason why he was making
24 those notes and making comments about whether they should
25 be talking about obscured nozzles that are being masked.

1 THE COURT: So it would implicate his role as
2 testified to on direct.

3 MR. STICKAN: Yes, Your Honor. I think the
4 implication here is he had a limited role and that
5 Mr. Geisen is a great guy and he's worked with Mr. Geisen,
6 but, in fact, there were other interactions that he had
7 with Mr. Geisen that I think raise some questions.

8 MR. WISE: Judge.

9 MR. CONROY: Your Honor, I would like to raise an
10 entirely different concern, which has to do with Mr. Cook
11 who, as you know, stayed a mile away from Mr. McLaughlin
12 not to allow cross of Mr. McLaughlin who in past by the
13 government on the first instance on Mr. Cook and --

14 THE COURT: I don't think that's being done.

15 MR. CONROY: I wouldn't be too sure about that,
16 Your Honor.

17 MR. STICKAN: I haven't asked about Mr. Cook.

18 MR. CONROY: I guaranty if this goes in it's --

19 THE COURT: There was no direct and you passed
20 direct, so there's nothing on Cook.

21 MR. WISE: Judge, I didn't ask a single question
22 about 2735. I asked him what his role was in drafting 2731
23 and that is all. This document that's up in front of him
24 wasn't the subject of any of his testimony and so to go
25 into this on cross examination --

1 THE COURT: Excuse me, let me interrupt you. I'm
2 not going to admit the document. I'm going to let him ask
3 him, does this refresh your recollection that you had a
4 role in a subsequent serial letter, did you also have that
5 same role in 2731. That's it.

6 MR. WISE: Okay.

7 MR. CONROY: Okay.

8 MR. WISE: That's fine.

9 (Side bar conference concluded.)

10 BY MR. STICKAN:

11 Q. Mr. McLaughlin, did you have a chance to look at
12 Government's Exhibit 95?

13 A. I did.

14 Q. And do you see some handwriting on Government's
15 Exhibit 95, looks like page 1 of 1 of the attachment 1?

16 A. Yeah, it appears I made two comments on this
17 document.

18 Q. Okay. And the comments that you've made, does
19 that refresh your memory in any way as to whether you had a
20 role to play in reviewing these documents and making
21 comments on them?

22 A. I did have a role to play with reviewing the
23 documents and making comments. But this particular
24 paragraph here dealt with the Structural Integrity
25 Associates results and also with future inspection. So

1 those two areas I would have been interested in.

2 Q. Okay. And the comment that you made was --

3 MR. WISE: Objection.

4 THE COURT: He's already looked at it. I think
5 you can ask him, as I suggested at side bar, if he had a
6 similar role in any other of the serial letters.

7 BY MR. STICKAN:

8 Q. Okay. Did you have a similar role in any of the
9 other serial letters?

10 A. Yes. My role -- in my opinion, my role of those
11 letters was to look for especially future inspection areas
12 and some of the later letters after this one that I
13 actually wrote those sections for the letters.

14 Q. Okay. For future inspections; is that correct?

15 A. Correct.

16 Q. But the letters also talked about past
17 inspections; isn't that correct?

18 A. That's correct.

19 Q. All right. And past -- and for purposes of past
20 inspections whether there was boron on the head or not,
21 that's an important subject to be discussed with respect to
22 past inspections; isn't that correct?

23 A. That would be true.

24 Q. The comment that you made here --

25 MR. WISE: Objection.

1 THE COURT: With regard -- not the comment but --

2 MR. STICKAN: I'm not going to say the comment.

3 I'm just going to say --

4 THE COURT: Overruled.

5 BY MR. STICKAN:

6 Q. This comment would also have some relevance to
7 past inspections too, wouldn't it, the comment that you
8 made on this document?

9 A. The one that I wrote, the sentence that I wrote
10 at the top of the document?

11 Q. Right.

12 A. No, that had nothing -- what that's talking about
13 is the as-left condition after the 12 RFO.

14 Q. Okay. I'll talk a little bit more about your
15 role. By the way, I think you testified that you became
16 aware that there was boron on the head at the same time
17 after the first submission, that's 2731, right?

18 A. That's correct.

19 Q. And -- but before the second submission, which
20 was 2735?

21 A. That's correct.

22 Q. All right. And do you remember when in time you
23 realized that there was boron on the head?

24 A. I don't remember how I came to know that.

25 Q. Okay. Well, what about when you gathered up the

1 tapes from Andrew Siemaszko around -- wasn't that around
2 October 3rd when Brian --

3 A. It was sometime after Dr. Sheron gave us a call.

4 Q. Wasn't that around October 3rd of '01?

5 A. I don't know.

6 Q. When using that as a benchmark, did you know when
7 the call came in from Dr. Sheron that there was head on
8 the -- there was boron on the head of the reactor?

9 A. I did.

10 Q. You did before that?

11 A. Yes.

12 Q. Okay. Do you remember how you became aware of
13 it?

14 A. No, I don't.

15 Q. Okay. In fact, you said you met with Mr. Gibbs;
16 is that right?

17 A. Correct.

18 Q. All right. And then he later sent you a letter?

19 A. Correct.

20 Q. All right. And it was Mr. Gibbs that told you
21 that, wasn't it? Didn't Mr. Gibbs tell you that?

22 A. I don't know. I really do not remember how I
23 came to find out.

24 Q. Well, that was a fairly important revelation on
25 your part, wasn't it?

1 A. Not really.

2 Q. Didn't mean anything to you that there was boron
3 on the head?

4 A. No.

5 Q. Okay. But you thought all along the head had
6 been cleaned up to that point?

7 A. That's correct. I mean, what all that meant to
8 me was that if there was boron on the head for sure, that
9 we would have to do supplemental inspections during the
10 outage.

11 Q. Okay.

12 MR. STICKAN: Your Honor, with the permission of
13 The Court, I ask permission to display Exhibit 65. I think
14 it's already been admitted.

15 BY MR. STICKAN:

16 Q. Do you see Exhibit 65 on your monitor? I'll
17 bring up the exhibit.

18 A. Yeah.

19 Q. Okay. Does this appear to be a copy of
20 Mr. Gibbs' letter to you?

21 A. Yes, it does.

22 Q. And it is addressed to you, right?

23 A. Correct.

24 Q. And in fact, it's dated September 14th, 2001?

25 A. Correct.

1 Q. So Mr. Gibbs' visit to you preceded this letter;
2 isn't that correct?

3 A. I believe so, yes.

4 Q. All right. By what, a week, couple weeks?

5 A. I don't remember the time frame. It wasn't a
6 couple weeks but --

7 Q. Okay. All right. Try to zoom this in here to --

8 MR. WISE: Your Honor, I'm sorry, our screen is
9 not up.

10 BY MR. STICKAN:

11 Q. And in fact, Mr. Gibbs told you in the first
12 paragraph of this letter that it is noted that on
13 completion of 12 RFO, the reactor vessel head did have
14 boric acid crystal deposits of considerable depth left in
15 the center top area of the head since cleaning this area
16 that time was not successful in removing all the deposits,
17 paren, partly due to limited access, end paren. Isn't that
18 correct?

19 A. That's what the letter says, yes.

20 Q. Okay. All right. And did you have a chance
21 to -- discuss this with Mr. Gibbs at all?

22 A. I don't remember discussing the fact that there
23 was boron on the head with Mr. Gibbs. Like I said earlier,
24 the two things I remember talking to him about were roles
25 and responsibilities for the team. And if you looked at

1 that first paragraph, the first couple sentences in that
2 same paragraph talked about the need to cut holes and that
3 there was disagreement on the team.

4 Q. All right. Let me talk about -- or let me get
5 back to the area of roles that you played in reviewing the
6 submissions. And directing your attention to submission
7 2735 --

8 MR. WISE: Objection outside the scope.

9 THE COURT: For the limited purpose of his role
10 in that and the previous, that's all.

11 MR. STICKAN: Okay.

12 BY MR. STICKAN:

13 Q. Did you have a role to play in 2735 that was
14 similar to the role that you played in 2731?

15 A. Is this -- is this the entire 2735 that I have
16 here?

17 Q. What exhibit do you have in front of you?

18 A. 95.

19 Q. No, that's not it, but I can get you a copy.
20 Hang on a second.

21 Hand you what's marked as Government's Exhibit
22 105. I think this is a copy of it. Okay.

23 A. Okay. My role for reviewing this letter would
24 have been to look at the plant design information as I did
25 in the first letter. And it would have been to look at the

1 discussion of result revolving around the Structural
2 Integrity Associates results, which are back here in the
3 gap analysis on page 4 of 5.

4 Q. Okay. All right. Now, in fact, you did review
5 another part of that report, didn't you?

6 A. Which part are you talking about?

7 Q. Well, specifically the tables that are included,
8 the nozzle-by-nozzle inspection that was attached to that
9 submission.

10 A. That's true. I looked at the tables, and I
11 remember thinking that they didn't tell me anything, so --
12 so I recommended that we provide the NRC with a pictorial
13 of what those tables were telling us so that it would be
14 much easier to tell what the tables were saying. So I -- I
15 had had a student put together a presentation, training
16 presentation that I was giving to the engineering folks.
17 And part of that presentation had head maps that showed
18 nozzle locations. I suggested that we take these tables
19 and we put it on the head maps so that you could see in
20 relation to the nozzle locations where the boron was.

21 Q. Okay.

22 A. I felt it made for a much clearer picture.

23 Q. All right. Well, in fact, in addition to doing
24 that, you had discussions with Mr. Geisen about the
25 footnote on that table, didn't you?

1 A. I'm sure in the meeting, we talked about that
2 footnote, yes.

3 Q. Okay. And you were troubled by that footnote,
4 weren't you?

5 A. I wouldn't say troubled, but I mean, it's -- when
6 you look at the table, it's pretty clear that you've got
7 two columns filled up, and there's a third one that's not,
8 and the only thing in that third one says see note one.

9 MR. STICKAN: With permission of The Court, I'd
10 like to display -- I believe Government Exhibit 105's
11 already been admitted.

12 THE COURT: Yes.

13 MR. STICKAN: Thank you.

14 THE COURT: Same purpose?

15 MR. STICKAN: Yes, Your Honor.

16 BY MR. STICKAN:

17 Q. All right. I'm going to draw your attention to
18 the footnote we're talking about. Do you see it on your
19 scene there? Forgive me if I'm --

20 A. Yeah, note one.

21 Q. Yeah, note one. Okay. You saw note one, and
22 you -- you had a -- with a number of people about
23 questioning note one, isn't that true?

24 A. I don't know if I had a discussion with a number
25 of people. I remember we were sitting in a meeting room

1 looking at this letter before we went out. And like I said
2 earlier, when you look at the three columns, the one that
3 has no data in it kind of stands out, so you kind of -- why
4 the two are different and the explanation was provided to
5 me that the tape or the video inspection for that
6 particular year did not have any orientation. So they
7 couldn't put that data in with a specific nozzle number
8 because the orientation's not there.

9 Q. Okay. Didn't you ask if this is true? Didn't
10 you question this?

11 A. I didn't question the results. What I
12 questioned -- I remember that I questioned why there wasn't
13 any data. When it was explained to me that they couldn't
14 put it in there correlated with the nozzle to nozzle, I
15 didn't question it any further.

16 Q. Okay. And in fact, you -- do you remember being
17 interviewed by Mr. Rossomme?

18 MR. WISE: Objection, Your Honor. This cannot be
19 about 2731.

20 MR. STICKAN: It's about his current testimony,
21 Judge.

22 THE COURT: I'll permit it for that limited
23 purpose.

24 BY MR. STICKAN:

25 Q. Okay. Do you remember being interviewed by

1 Mr. Rossomme?

2 A. I do.

3 Q. Okay. And -- and didn't he ask you about -- I
4 think it was question 35. One of his questions was on
5 attachment two page 2 of 2, it states the entire RPV head
6 was inspected. Is that true?

7 Note page 2 of 5 says that 65 of 69 were
8 inspected. Okay. And your answer, was it not, was I took
9 it at face value, several of us asked if this was true.
10 The issue with the 1996 inspection was we didn't videotape
11 the whole thing. So you had to go to the person doing the
12 inspection. This chart came up the last day and I remember
13 a lot of discussions if it was right. We had to trust
14 their word. No way to verify.

15 That's what you told Mr. Rossomme, right?

16 A. Right. I would say that that characterizes what
17 we were doing here because you couldn't -- because you
18 couldn't go and put a nozzle-by-nozzle comparison. You had
19 to trust the person who was doing the inspection, whether
20 they had 100 percent of the head or not.

21 Q. In fact, you talked to -- you questioned this to
22 the point where you actually approached Mr. Geisen, isn't
23 that correct, about this language?

24 A. I don't remember.

25 Q. All right. Didn't he offer you assurances that

1 this table was correct?

2 A. I know we talked about it in a meeting when we
3 were reviewing this and I was -- I was assured that it was
4 correct.

5 Q. He assured you that this table was correct,
6 right?

7 A. Correct.

8 Q. All right. And that -- and that gave -- that
9 made you feel more comfortable; is that correct?

10 A. Yes.

11 Q. All right. But let me ask you this:
12 Mr. Geisen -- didn't Mr. Geisen tell you that the whole
13 thing, this whole -- the whole inspection wasn't present on
14 the tape and that they had to rely on the recollection of
15 others who were involved in the inspection?

16 A. I remember something like that. And he also said
17 that it was -- he named the individual who had done the
18 inspection. And I trusted that person.

19 Q. 10 RFO, that's 1996, right?

20 A. That could have been, yeah.

21 Q. Okay. And the fact is that he's telling you that
22 the whole inspection wasn't found on that videotape, that
23 in order to create this chart, they had to go out and talk
24 to the person who five years ago had looked at the top of
25 that head. That's what he was telling you, right, isn't

1 that correct?

2 A. All -- I don't remember whether we talked about
3 whether there was any nozzles that were left out. I do
4 remember that we had to rely on a person's memory for parts
5 of the inspection, yes.

6 Q. Didn't you tell Mr. Rossomme that the issue with
7 the 1996 inspection was we didn't videotape the whole
8 thing? That's what you told him, right?

9 A. Could have been, I --

10 Q. Your memory back then?

11 A. Sure. The nozzles or the interview?

12 Q. And Mr. Rossomme interviewed you in June -- on
13 June 20th of 2002, right?

14 A. Correct.

15 Q. And your memory back then was -- would be better
16 than it is today, right?

17 A. Should be.

18 Q. Five years later, right?

19 A. Now, I do know that there are other incorrect
20 statements in that report of his --

21 Q. Well, I'm asking about this statement. Okay.
22 Mr. Geisen told you that they had to rely on somebody's
23 memory?

24 A. Yes.

25 Q. To -- to prepare a -- this chart --

1 A. Correct.

2 Q. -- is that correct? All right. Does this -- is
3 that noted in footnote one, that we're relying on
4 somebody's memory to put this chart?

5 MR. WISE: Objection, relevance and scope, Judge.

6 THE COURT: Sustained. Let's move on.

7 MR. STICKAN: Okay. Thank you, Your Honor.

8 BY MR. STICKAN:

9 Q. All right. Well, let's -- let's think about that
10 for a while, okay. Mr. Geisen was telling you that --

11 MR. WISE: Objection, relevance and scope.

12 THE COURT: You don't know yet what the
13 question's about. Let's wait for the question.

14 MR. WISE: Okay.

15 MR. STICKAN: Your Honor, following up on his
16 prior answer.

17 BY MR. STICKAN:

18 Q. Mr. Geisen was telling you that they were relying
19 on somebody's memory to prepare this chart. Did it cause
20 you any concern that this -- this inspection took place
21 five years ago and they were going to rely on somebody who
22 had viewed 69 nozzles five years ago to indicate what the
23 condition of those nozzles were five years later?

24 MR. WISE: Judge, same objection. Relevance and
25 scope.

1 THE COURT: I don't see what this has to do with
2 the direct examination of this witness.

3 MR. STICKAN: Okay. I'll move on, Your Honor.
4 Thank you.

5 BY MR. STICKAN:

6 Q. Incidentally, you were talking about babysitting
7 Framatome in your direct testimony; isn't that correct?

8 A. Correct.

9 Q. All right. And let me ask you this: With
10 respect to -- I think you already indicated you made some
11 notes with respect to your section of the report, and some
12 of those notes related to boron; isn't that correct?

13 A. Which --

14 Q. That last exhibit, excuse me, I think it was
15 Exhibit 95 that you reviewed.

16 A. Can you repeat the question, please?

17 Q. I think you indicated that you had made some
18 notes on a report that related -- you said it related to
19 your section of the report, is that correct, handwritten
20 notes?

21 A. No. What I said was we should state that the top
22 is mask -- and gives nozzle areas, which are masked, so
23 that would have probably related to some other part of the
24 report.

25 Q. Some other part of the report other than what you

1 were assigned to do?

2 A. That's correct.

3 Q. Oh, okay. So you were looking at the other
4 reports, other parts of the report and commenting on them
5 as well; is that correct?

6 A. For this letter, I may have because it was short.

7 Q. Okay. Incidentally, do you know what flange
8 boron looks like?

9 A. Flange boron?

10 Q. Yeah, do you have -- do you have any idea what
11 flange boron leakage looks like?

12 A. What I've seen is that it sprays out onto other
13 flanges. And from my past history of the Framatome
14 babysitter, you could see boron on top of the insulation.

15 Q. All right. Do you remember being asked that
16 question by Mr. Rossomme when he interviewed you back in
17 June of 2002?

18 A. What was the question again?

19 MR. WISE: Objection to relevance and scope.

20 THE COURT: Sustained. Government had the
21 witness on direct.

22 MR. STICKAN: Yes, Your Honor. I'm just
23 following up on his prior answer, if we're on cross
24 examination.

25 THE COURT: Yeah, cross examine those aspects of

1 his direct testimony, not the entire knowledge of his work
2 at Davis-Besse.

3 BY MR. STICKAN:

4 Q. Okay. You talked about the crawler being used
5 for 13 RFO on direct; isn't that correct?

6 A. That's correct.

7 Q. All right. The crawler -- this crawler was never
8 used on any of the prior inspections before 13 RFO; isn't
9 that correct?

10 A. Are you talking -- talking about a specific piece
11 of equipment?

12 Q. Yes?

13 A. Oh, you mean at Davis-Besse?

14 Q. Exactly, at Davis-Besse.

15 A. Not to my knowledge.

16 Q. Okay. So all -- your testimony about a crawler
17 pertained to something that you were looking into for 13
18 RFO; isn't that correct?

19 A. That's correct.

20 Q. It had nothing to do with the past inspections
21 that occurred in 10 RFO or 11 RFO or 12 RFO, because there
22 was no crawler involved; isn't that correct?

23 A. I don't know how they do the past inspections.

24 Q. Well, you said you were looking into ordering a
25 crawler?

1 A. No.

2 Q. Okay.

3 A. What I did is contract Framatome, and Framatome
4 brought it up, used it and they would have taken it away.

5 Q. All right. So your testimony is you didn't know
6 what type of equipment was being used to clean the head
7 prior to 13 RFO?

8 A. Correct.

9 Q. Okay. Now, you were ahead of the I-600
10 Committee, weren't you?

11 A. After I became the project manager in middle
12 August.

13 Q. And part of your job as part of that committee
14 was to plan for the 13th refueling outage and to inspect
15 and clean the head during that outage?

16 A. That's correct.

17 Q. All right. And so as part of your duties, didn't
18 have you to look into what type of equipment was being used
19 to clean the head previously?

20 A. No.

21 Q. That never came up?

22 A. No.

23 Q. No one ever told you that they were using a stick
24 with a camera at the end?

25 A. They may have, but that was irrelevant to me.

1 Q. Okay.

2 A. We had contracted -- we had -- I had given an
3 action to radiation protection individual, and eventually
4 we contracted with Master Lee who said they had the
5 equipment to come in and clean through the mouse holes.

6 Q. Well, one thing you knew for sure is you had to
7 do a lot better job in 13 RFO than you've ever done in the
8 past cleaning the head; isn't that correct?

9 A. That's correct. The goal was to have that head
10 pristine when we left 13 RFO.

11 Q. All right. And we -- you were asked some
12 questions about the interference gap in the SI -- I guess
13 you contracted with the Structural Integrity Associates,
14 SIA, and the interference gap that was present; isn't that
15 right?

16 A. Correct.

17 Q. And I think you testified that the nozzles had to
18 have a gap in them in order to -- to display the popcorn
19 deposits from a cracked nozzle; isn't that correct?

20 A. That's correct.

21 Q. All right. If there was no gap, there would be
22 no evidence of that? It wouldn't leak, so it wouldn't show
23 evidence of leakage?

24 A. That's correct.

25 Q. All right. And if it did leak or it did have a

1 gap, then it was capable of leaking boron, isn't that
2 correct, if it had a gap?

3 A. That's -- yes.

4 Q. And you could perform a visual inspection on that
5 nozzle if it had a gap?

6 A. That's correct.

7 Q. Now, you keep saying that it was a more
8 conservative analysis, just not to tell the NRC about the
9 fact that you later found out there was a gap in the top
10 four nozzles?

11 A. That's correct.

12 Q. All right. And the top four nozzles included
13 nozzle three; isn't that correct?

14 A. Correct.

15 Q. All right. And the reason I think you testified
16 was that you were going -- it's just more conservative not
17 to fill them in on that, right?

18 A. Well, the probabilistic risk assessment assumed
19 that no inspection of those four nozzles had been performed
20 in the past. And then -- so then when you start carrying
21 that into the issue that was being looked at at the time,
22 which was circumferential cracking of nozzles, it was -- it
23 would be more conservative to say that we were able to
24 inspect those top four nozzles.

25 Q. Well, but, in fact, you weren't able to inspect

1 them, were you; isn't that right?

2 A. I don't know if they inspected this item in 1996
3 or not.

4 Q. You knew that there was boron on top of the head
5 in 1999, in 2000, right?

6 A. Correct.

7 Q. Okay. You've known that there's been boron on
8 the top of the head in 10 RFO and 11 RFO and 12 RFO, isn't
9 that correct, you knew that?

10 A. I knew there was a legacy of having boron on the
11 head, yes.

12 Q. On the top of the head?

13 A. I don't know about the top, but I know that there
14 was a legacy of boron on the head.

15 Q. So there was really no way, I mean, it's -- it's
16 disingenuous, isn't it, to say that we can now go inspect
17 these four nozzles when they're buried under boron?

18 MR. WISE: Same objection, Your Honor, relevance
19 and scope.

20 THE COURT: Sustained.

21 BY MR. STICKAN:

22 Q. You previously testified when Mr. Wise --
23 Mr. Wise over here --

24 A. I understand that.

25 Q. -- was asking you questions that -- that you

1 didn't tell the NRC because it was more conservative not
2 to, right?

3 A. That's correct.

4 Q. Okay. In fact, the -- if you have a gap in your
5 nozzles which you knew it in fact -- which you knew after
6 you received an -- I think the e-mail went in, I don't
7 remember the exhibit, but you knew that at some point there
8 was a gap in the nozzles; isn't that correct?

9 A. Structural Integrity Associates sent me revision
10 one calculation that showed all the nozzles on the head
11 would have a gap.

12 Q. And in fact, after that e-mail came in, you
13 traveled to the NRC as part of the presentation of --

14 THE COURT: Let's -- enough. I think we've
15 covered the subject.

16 MR. STICKAN: Your Honor, I have one more
17 question.

18 THE COURT: All right.

19 BY MR. STICKAN:

20 Q. If you have a gap in the nozzle, you also have
21 another source of leakage, do you not, in addition to
22 flange leakage? You have another potential source of
23 leakage; isn't that correct?

24 A. If you make the assumption that there was a crack
25 in the nozzle, yes.

1 Q. Okay. Thank you.

2 MR. STICKAN: Can I have one minute, Your Honor?

3 No further questions, Your Honor.

4 REDIRECT EXAMINATION

5 MR. WISE: Your Honor, I can be brief but I know
6 The Court had a commitment.

7 BY MR. WISE:

8 Q. Mr. McLaughlin, I guess I should have introduced
9 myself when we started. I'm Andrew Wise.

10 A. I'm sorry. My mind was back in the past.

11 Q. I was quite impressed with myself so it's good
12 you took me down. Let me ask you a couple questions about
13 this October 17th section. In the table in 2735
14 Mr. Stickan was asking you about, do you recall the
15 conversation he was asking you about?

16 A. Yes.

17 Q. When Mr. Geisen was talking to you about the
18 nozzle-by-nozzle table, it was your understanding at that
19 time that Mr. Siemaszko was constructing that table,
20 correct?

21 A. I -- my understanding was that it was a
22 combination of Mr. Siemaszko, Mr. Mainhardt and maybe
23 Mr. Chimahusky.

24 Q. Mr. Geisen never told you that he had viewed the
25 videotapes in reviewing this table, did he?

1 A. No, he didn't.

2 MR. STICKAN: Objection.

3 THE COURT: On what basis?

4 MR. STICKAN: Hearsay.

5 THE COURT: Overruled.

6 BY MR. WISE:

7 Q. Mr. Geisen never told you he had spoken with the
8 people that did the '96 inspection while those gentlemen
9 were constructing the table, correct?

10 A. Correct.

11 MR. WISE: That's all I have. Thank you.

12 THE COURT: Ladies and gentlemen, we're now going
13 to take our mid-morning break. Please remember my previous
14 admonitions to you not to discuss this case among
15 yourselves nor with anyone else or permit anyone else to
16 discuss it with you, and don't make up your mind on the
17 ultimate issues to be decided with you at the end of the
18 case. We'll be back in place at 11:00.

19 (A brief recess was had.)

20 THE COURT: Please call your next witness.

21 MR. HIBEY: Thank you, Your Honor. Defense calls
22 Dr. Daniel Bullen.

23 DANIEL BULLEN

24 was herein, called as if upon examination, was first duly
25 sworn, as hereinafter certified, and said as follows:

1 DIRECT EXAMINATION

2 BY MR. HIBEY:

3 Q. Good morning, sir.

4 A. Good morning.

5 Q. Would you kindly state your name?

6 A. Daniel Bernard Bullen.

7 Q. Spell your last name, please.

8 A. B-U-L-L-E-N.

9 Q. What is your occupation, sir?

10 A. I am a senior managing engineer for Exponent
11 Failure Analysis Associates.12 Q. And would you describe to the jury what your
13 academic background is?14 A. I have a Bachelor of science in engineering
15 science from Iowa State University, Master of science in
16 nuclear engineering from the University of Wisconsin,
17 Madison, a Master of science and material science from the
18 University of Wisconsin, Madison and a Ph.D. in nuclear
19 engineering with a minor in metallurgical engineering from
20 the University of Wisconsin, Madison.

21 Q. And have you had an academic background?

22 A. Yes.

23 Q. Would you describe to the ladies and gentlemen of
24 the jury your occupational history and your academic
25 background?

1 A. Following the completion of graduate school, I
2 worked at Lawrence Livermore National Laboratory as an
3 engineering in chemistry and material science department.
4 I also worked as a subcontractor and consultant to that
5 same laboratory. In 1989, I accepted an academic position
6 as assistant professor of nuclear engineering at North
7 Carolina State University. After one year, I accepted
8 another position at the Georgia Institute of Technology as
9 assistant professor of -- on mechanical and nuclear
10 engineering, and for 12 years from 1992 until 2004, I was
11 associate professor of mechanical engineering and nuclear
12 engineering at Iowa State University where I also served as
13 the program coordinator for the nuclear engineering
14 graduate program and the director of the nuclear reactor
15 laboratory.

16 Q. Do you hold any professional licenses?

17 A. Yes, I do.

18 Q. What are they?

19 A. I am a licensed professional engineer in the
20 states of Illinois, North Carolina, and Georgia. I'm a
21 licensed mechanical nuclear and metallurgical engineering
22 in the State of California. I'm a licensed mechanical
23 nuclear and metallurgical engineering in the State of Iowa,
24 and I'm also a licensed mechanical metallurgical and
25 nuclear engineering in the State of Nevada.

1 Q. Have you published in the course of your career?

2 A. Yes, as an academic, I think my vita has
3 approximately 50 or 55 publications over the course of 12
4 to 15 years.

5 Q. And the most recent in that regard?

6 A. Would have been last year, 2006.

7 Q. Are you a member of any commissions by virtue of
8 executive appointment?

9 A. Yes, I have the privilege of serving as a member
10 of the U.S. Nuclear Waste Technical Review Board from 1997
11 to 2004. I was appointed by the President of the United
12 States in 1997 and reappointed to serve in 2002 to 2004.

13 Q. I'm going to put a binder in front of you that
14 contains a number of exhibits that we might use during the
15 course of your direct examination. And I will ask you to
16 open it up and take a look at Exhibit Number 25.

17 A. Yes.

18 Q. Can you identify that document?

19 A. That's a copy of my vita.

20 Q. Also known as your resume; is that correct?

21 A. Correct, sorry.

22 MR. HIBEY: Your Honor, may I respectfully move
23 Defendant's 25 into evidence, the resume of Dr. Bullen?

24 MR. POOLE: We object. I think the testimony is
25 sufficient.

1 THE COURT: Will it reduce the length of the
2 interrogation with regard to qualifications?

3 MR. HIBEY: Yes, Your Honor, it will conclude my
4 examination.

5 THE COURT: Objection overruled. What will that
6 be, Exhibit 17?

7 MR. HIBEY: Defense 25.

8 THE COURT: Okay.

9 MR. HIBEY: So I am told by those who keep track
10 of these things.

11 BY MR. HIBEY:

12 Q. Would you describe the work of your current
13 employer, Exponent Failure Analysis?

14 A. Exponent is a professional scientific company
15 that provides technical support to business and industry.
16 Predominately what we do are failure analysis. We have
17 other aspects of our organization, but failure analysis and
18 support of investigation of failure analysis is one of the
19 primary operations of our company.

20 Q. All right. When you say failure analysis, what
21 are you talking about?

22 A. We have a group of scientists and engineers who
23 are dispatched, if you will, when failures occur. Our
24 company has been around for 40 years. We've been
25 investigating failures that date back to, for example, the

1 Hyatt Regency walkway collapse in Kansas City. We were
2 brought in to take a look at The World Trade Center
3 collapse on 9-11, and we've done many other high profile
4 failures analysis throughout the course of the history of
5 our company.

6 Q. When you say failure analysis per se, what are
7 you talking about?

8 A. We're talking about detail, the scientific and
9 engineering analysis to determine the cause of the failure
10 and the consequences thereof.

11 Q. Is failure analysis recognized as a discipline in
12 the field of engineering?

13 A. Yes.

14 Q. Directing your attention to the wastage event at
15 Davis-Besse in 2002, what work, if any, did Exponent
16 Failure do regarding that?

17 A. We were retained to complete a failure analysis,
18 in support of an insurance claim.

19 Q. And as to that work, what was your role in it?

20 A. I served as the project manager for the team of
21 scientists and engineers that Exponent put together to
22 address the issues.

23 Q. And what areas, if any, of your expertise did you
24 apply in your performance of Exponent Failure Analysis of
25 the Davis-Besse event?

1 A. My personal expertise were in the areas of
2 mechanical engineering, metallurgical engineering and
3 nuclear engineering.

4 Q. Dr. Bullen, is your testimony -- in your
5 testimony here today, will you be using your expertise in
6 those fields to support what you're saying?

7 A. Yes.

8 MR. HIBEY: Your Honor, I respectfully proffer
9 this witness as an expert in the field of mechanical
10 nuclear and metallurgical engineering failure analysis.

11 MR. POOLE: No objection, Your Honor.

12 THE COURT: Thank you. Ladies and gentlemen,
13 that motion will be granted. I'm sorry. And as I've
14 explained to you before, experts are so denoted as they are
15 unlike other fact witnesses permitted to express opinions
16 in the areas in which they have sufficient expertise as in
17 this case, mechanical engineering.

18 Please proceed.

19 MR. HIBEY: And nuclear engineering.

20 THE COURT: And nuclear engineering as well.

21 MR. HIBEY: And metallurgical engineering as
22 well. Thank you.

23 BY MR. HIBEY:

24 Q. Dr. Bullen, did Exponent Failure conduct its work
25 and do its report at the request of David Geisen or Rod

1 Cook?

2 A. No.

3 Q. At the time you were doing the work that resulted
4 in your reporting on, did you have any idea that it might
5 become and your testimony might be solicited in this
6 criminal case?

7 A. No.

8 Q. When the Exponent Failure folks concluded their
9 study and wrote their report, did the criminal case have
10 any bearing on it?

11 A. No.

12 Q. During the time Exponent Failure was conducting
13 its analysis, did anyone or you at Exponent Failure, to
14 your knowledge, have any contact with these defendants,
15 David Geisen and Rod Cook?

16 A. No.

17 Q. Did you have any contact with their lawyers?

18 A. No.

19 Q. When Exponent Failure undertook the work
20 associated with its analysis of the Davis-Besse cavity
21 event, what were your colleagues and you intending to
22 accomplish?

23 A. The purpose of our investigation was to complete
24 a failure analysis, to identify the cause of the formation
25 of the cavity and the sequence of events that led to it.

1 Q. Now, was the Exponent Failure Analysis Report
2 done for the purpose of giving testimony in this criminal
3 case?

4 A. No.

5 Q. Let me ask you, sir, do you have an opinion,
6 based on reasonable scientific certainty, within the areas
7 of your expertise, as to whether the cavity on the surface
8 of the vessel head at Davis-Besse was in existence in 1998?

9 A. Yes.

10 Q. What is that opinion?

11 A. It was not.

12 Q. I put the question to you as to whether, based
13 upon your expertise and reasonable scientific certainty,
14 whether the cavity on the surface of the vessel head at
15 Davis-Besse was in existence in the year 2000.

16 A. There was no cavity on the surface in 2000.

17 Q. All right. Sir, would you explain to the ladies
18 and gentlemen of the jury what the basis for that opinion
19 is?

20 A. Yes. Our investigation actually worked
21 backwards. We got to look at the end state of the wastage
22 cavity, the cracks that were in the nozzle and the cracks
23 that we identified in the J-Groove weld, and then take a
24 look at additional information that became available to us.
25 We had information on actual measurements of the cracked

1 nozzle material. We had information on corrosion
2 investigations that were completed by Argon National
3 Laboratory. And we had metallurgical investigations of the
4 actual broken piece, if you will.

5 Based on this information, we developed computer
6 models to first determine what the stress state was in the
7 J-groove weld and the area near the nozzle. After we
8 identified the stress state, then we took a look at the
9 crack growth rate for that stress state based on the
10 measurements from Argon National Laboratory and worked
11 backwards. We knew how long the crack was at the end. We
12 also knew that the stresses were such that the crack would
13 still be growing so it wasn't like the crack had stopped.
14 Then we back calculated for the stresses that were
15 measured -- excuse me, the cracked growth rates that were
16 measured at Argon to determine when did that crack peek
17 above the J-Groove weld and start to leak.

18 When we looked at that information, then we did a
19 determination of once the crack is above the weld, how much
20 fluid flows through it. This is a thick-walled tube, if
21 you will, so the fluid has to flow through a torturous
22 path. So there are computer models and actually analytical
23 measurements, laboratory data, that we use to correlate the
24 length of the crack with how much fluid flows through.
25 After the fluid flows through the crack, then we took a

1 look at a computer model called computational fluid
2 dynamics where we looked at the state of the liquid as it
3 changes to steam. And we wanted to know what's the
4 temperature inside the area right outside the crack, what's
5 the velocity of the liquid, if there's liquid, how much
6 steam is there, what kind of environment would you see?

7 Based on those four sets of calculations, stress
8 state, crack growth rate, flow through the crack itself and
9 then the evaluation of the environment at the outside of
10 that crack, we developed a time line that described the
11 formation of the subsurface wastage cavity, and ultimately
12 as that small wastage cavity uncovered the very large
13 J-groove weld crack, we came up with a sequence of events
14 that led us to the conclusion that the small cavity formed,
15 grew down to the J-groove weld crack. When the J-groove
16 weld crack uncovered, the leak rate increased dramatically,
17 almost eight fold, and that large increase in leak resulted
18 in the formation of the large wastage cavity sometime
19 between the October, November 2001 timeframe and the ends
20 of the cycle in February, 2002.

21 Q. All right. Let's see if we can unpack --

22 A. Sorry.

23 Q. -- that description. When did the cavity form?

24 A. The small subsurface wastage cavity began forming
25 when the crack reached the top of the J-groove weld and

1 began leaking. That would have been in the mid 1999 time
2 frame.

3 Q. I'm going to ask you to take a look at defense
4 Exhibit 22, A through J.

5 A. Sure.

6 Q. Can you identify what this exhibit is?

7 A. Yes. This is a schematic of the Davis-Besse
8 reactor.

9 Q. Now, that is -- that's 22-A; is that correct?

10 A. Correct.

11 Q. All right. Now, beneath that, you have 22-B and
12 C, and if you would be kind enough to describe those as
13 well.

14 A. Yes. These are actually computer aided design
15 images that we developed from the blueprints of the
16 Davis-Besse reactor pressure vessel head to describe the
17 geometry of the situation we're looking at. The item 22-B
18 is a picture of -- or an image of the reactor pressure
19 vessel head showing all 69 nozzles and showing the mirror
20 insulation and the bottom of what's called the service
21 structure.

22 Q. 22-C?

23 A. 22-C. We have removed the mirror insulation and
24 we've left the bolt ring that has the inspection ports,
25 sometimes called mouse holes, sometimes called weep holes.

1 So those are the ports through which the head inspections
2 were completed.

3 Q. And 22-D?

4 A. 22-D is we've removed everything just to show the
5 nozzles and the reactor pressure vessel head.

6 Q. And 22-E?

7 A. 22-E is a section through the reactor pressure
8 vessel head located at nozzle three, the nozzle that
9 cracked.

10 Q. And 22-F?

11 A. 22-F is that same nozzle showing a section
12 through the nozzle and giving a better image of the
13 J-Groove weld location, which you can see on the right, and
14 the reactor pressure vessel head material, which is the
15 brown thick material also shown on the right. The blue
16 material that's kind of at the bottom of it there that runs
17 across the base, they're the J-groove weld which is the
18 stainless steel cladding that lines the interior of the
19 reactor pressure vessel head.

20 Q. All right. And our next one is 22. We're at G
21 now?

22 A. Yes.

23 Q. Yes.

24 A. 22-G shows the location of the crack in the
25 nozzle, and actually the partial crack in the J-Groove weld

1 as our modeling predicts it to have been during the 12th
2 refueling outage in April, May of 2000.

3 Q. And then 22-H?

4 A. 22-H is the extent of the crack which has grown a
5 little bit above -- a little bit more above the J-Groove
6 weld and the beginnings of the formation of the subsurface
7 wastage cavity as we expect it to have existed in the mid
8 cycle 13 April, May, 2001 time frame.

9 Q. And then 22-I?

10 A. 22-I represents what we consider to be the
11 tipping point or the event of the moment when the
12 subsurface wastage cavity uncovered the J-Groove weld in
13 the late October time frame of 2001 and resulted in a
14 significant increase in the leakage rate.

15 Q. All right. And then in 22-J?

16 A. 22-J is our representation of the final wastage
17 cavity size and location with respects to how it was found
18 in February of 2002.

19 Q. Do these exhibits -- first of all, are you
20 responsible for the creation of these exhibits?

21 A. Yes, I am.

22 Q. Do these exhibits graphically display the time
23 line that you have described to the jury with respect to
24 the development of the cavity in this case?

25 A. Yes, they do.

1 MR. HIBEY: Your Honor, may I respectfully move
2 22-A through J into evidence at this time?

3 MR. POOLE: No objection.

4 MR. HIBEY: Your Honor, once again, the challenge
5 of technology is before me. I would like to have these
6 displayed through the miracle of everything that's here and
7 ask the -- ask Ms. Robinson if she can do that for me.

8 THE COURT: Very good. I presume there are no
9 objections on behalf of Defendant Cook.

10 MR. CONROY: None, Your Honor.

11 THE COURT: And because of multiple defendants,
12 unless I hear, Exhibits 22-A through J of defendant will be
13 admitted and may be displayed to the jury.

14 MR. HIBEY: Thank you.

15 BY MR. HIBEY:

16 Q. All right. Sir, what do we have here?

17 A. This, again, is the Davis-Besse reactor
18 schematic. This shows actually only one of the steam
19 generators. There are two, but it gives a representation
20 of the components in the reactor is many.

21 Q. All right. Now, when you say it's showing the
22 components of the reactor system, can you point on that
23 screen to what you're talking about?

24 A. Oh, sure. Does it show up if I touch --

25 THE COURT: Uh-huh.

1 A. This is the reactor. This is the steam
2 generator. This is the pressurizer. We're actually
3 interested in the reactor pressure vessel head which has
4 control rod drives above it.

5 Q. And where's that, sir?

6 A. That's actually up here (indicating).

7 THE COURT: I said you could but --

8 THE WITNESS: You said I could try, right?

9 THE COURT: It seems to be.

10 THE WITNESS: Am I too sweaty or something? I'm
11 making it blue but not where I want it.

12 THE COURT: If you know, Mr. Hibey, you touch it
13 and see if it works and ask him if that's correct, please.

14 THE WITNESS: That will be great.

15 MR. HIBEY: That's putting me at great risk, Your
16 Honor.

17 BY MR. HIBEY:

18 Q. Where would you like to be in relation --

19 A. Well, if you want -- the upper blue dot that's
20 already on there is a steam generator. The lower blue dot
21 that's there is actually sort of kind of touching the
22 pressurizer, and if the big red thing in the middle is the
23 reactor vessel, the top of which is the reactor pressure
24 vessel head which is where we are interested.

25 Q. All right. Let's move to the next exhibits.

1 A. Sure.

2 Q. All right. Sir, putting aside the three blue
3 dots, what do we have here?

4 A. Okay. This is the head itself.

5 Q. Right.

6 A. That little blue dot that I just left, this is
7 the mirror insulation. It's this -- this top region right
8 here is the mirror insulation. Oh, I can draw a line, I'm
9 sorry. And these are the nozzles up here.

10 Q. Okay. Let's go on --

11 A. Okay.

12 Q. -- to the next picture, please.

13 A. Here we've removed the mirror insulation, and the
14 purpose of this image is to show that down here are the
15 mouse holes down in this ring or here, actually these
16 little individual openings, the square brackets on the
17 mouse holes.

18 Q. Now let's go on.

19 A. This is just an image of where we've removed
20 everything except the nozzles.

21 Q. Now, let's get to 22-E, the next one.

22 A. Okay.

23 Q. Go ahead.

24 A. This is our representation of the head itself
25 with only nozzle three still intact. And again, this is

1 the representation of the nozzle close up showing it, the
2 cut-away of the reactor head.

3 Q. Now, with respect to this particular nozzle, why
4 is it that you display and identify nozzle three?

5 A. Nozzle three is the nozzle that was adjacent to
6 the wastage cavity, and that had the crack that resulted in
7 leakage.

8 Q. All right. Now, let's move onto the next
9 exhibit, which is 22-F. Tell us what that shows.

10 A. This is that same image only cutting cross
11 section, and we wanted to highlight a number of things
12 here. This is the J-Groove weld right here in the center,
13 the blue area that's along the bottom here, and that
14 runs -- right there is the cladding that's on the interior
15 of the reactor pressure vessel head. This region right
16 here is actually the cross-section of the nozzle. So this
17 is the nozzle cut in half, and these dark areas on the side
18 are the reactor pressure vessel head structure material
19 that at --

20 Q. That would be the head itself?

21 A. That's the -- the alloy steel is part of the head
22 that underwent the wastage.

23 Q. So now, let me take you to the 22-G.

24 A. Yes.

25 Q. And what is 22-G?

1 A. 22-G is the same representation as before. The
2 key element here is the determination of the extent of the
3 crack from the nozzle and into the J-groove weld. The red
4 portion that runs along the nozzle is a through-wall crack
5 from the nozzle itself, in the nozzle material itself, and
6 there's a small portion that is also grown into the weld.

7 Q. So if I understand you correctly, the image on
8 the left is the nozzle number three, which is identified as
9 having cracks. And the image on the right is the blow up
10 of the rectangular portion of the image on the left to
11 focus on the cracks that existed in April and May of 2000;
12 is that correct?

13 A. Correct. If you look at the image on the left,
14 there's a little gold box. That little gold box is the
15 same gold box on the right. It's supposed to represent
16 that. Sometimes power point doesn't line them up quite
17 right.

18 Q. Let's move on to 22-H.

19 A. Okay.

20 Q. And what do we got here?

21 A. This, again, is a representation of the extent of
22 cracking. You see that the red crack has grown a little
23 bit both in axial length as well as grown into the weld and
24 the small subsurface wastage cavity has begun to form.
25 There's -- actually the blue area represents our

1 representation of the wastage cavity. And if you look at
2 the -- the image on the left, you can see a small part of
3 the blue area on the screen that shows there, so we have
4 essentially the same image that we had in the previous one,
5 just showing the wastage cavity.

6 Q. How did you come to conclude to this image that
7 now you have a wastage that's moving up from that weld
8 crack?

9 A. Actually, our computational fluid dynamics
10 analysis led us to conclude that the wastage cavity begins
11 to form in the subsurface because the temperature
12 conditions and the moisture conditions are such that the
13 process of corrosion driven by metaboric acid begins.

14 Q. Okay.

15 A. Sorry.

16 Q. All right. Computational fluid dynamics, that's
17 a mouth full. What is that?

18 A. It's essentially just a bookkeeping method that
19 allows us to divide up this area into a grid. And in each
20 little element of the grid, we look at a theoremtic
21 conditions that exist, what's the temperature, what's the
22 pressure, how much material is in there, how fast the
23 material is moving, if there are any chemical changes in
24 that material. And then we follow those pieces of material
25 as they move through the grid. And we then determine, for

1 example, what's the surface temperature inside of the
2 annular gap.

3 Q. What -- stop right there. What's an annular gap
4 and point to it.

5 A. The annular gap is the region between -- it's the
6 region between the reactor pressure vessel head and the
7 nozzle. When the head is manufactured, they drill the
8 holes and line it up, but then they dip the nozzle in
9 liquid nitrogen. The liquid nitrogen cools it. They put
10 it in. It expands after, grows up. It's called an
11 interference fit. So although there's a tight bond, it's
12 not a metallurgical bond. It's just a mechanical bond, and
13 that mechanical bond would allow for fluid like steam to
14 escape.

15 Q. So on the basis of computational fluid dynamics
16 in which you are taking into account temperature -- and
17 what else, please?

18 A. Pressure.

19 Q. Pressure?

20 A. Also the content of the fluid, if it's all
21 liquid, if it's liquid and steam, if it's all steam. We
22 also take a look at the chemical species that may be
23 deposited.

24 Q. All right. Considering those factors in this
25 dynamic that you've just described, this is how you came to

1 identify at this point in time the existence of the crack
2 in the cavity?

3 A. The critical parameter here is the flow rate. If
4 the flow is too slow, then all of the liquid flashes to
5 steam, and the temperature is not reduced very much. As
6 the crack gets longer, the flow rate increases, there's
7 more liquid that has to change from liquid to steam, and it
8 cools the cavity, or cools the annulus because it changes
9 to steam. When the temperature gets to the correct
10 temperature, and actually it's a temperature between 350
11 degrees Fahrenheit and 450 degrees Fahrenheit, we have
12 conditions that allow the formation of molten metaboric
13 acid.

14 Q. Which is what?

15 A. It's what happens to the boron in the liquid when
16 it solidifies and then melts again.

17 Q. All right.

18 A. This material was thought to be not corrosive
19 until experiments by Argon National Laboratory published in
20 2005 showed significant corrosion propensity for wetted
21 molten metaboric acid.

22 Q. So was it wetted molten metaboric acid that was
23 at work and created the crackage and the cavity as depicted
24 in this particular exhibit, 22-H?

25 A. Only the wastage cavity. The metaboric acid had

1 no effect on the crack growth.

2 Q. All right. So it's the blue part as opposed to
3 the red part that you're talking about?

4 A. I'm talking about what happens in the blue part,
5 correct. And if I may interject, the reason that the
6 cavity gets bigger up above is because that's where the
7 temperature is cool enough for the metaboric acid corrosion
8 to occur.

9 Q. So are you describing a chemical activity at
10 work?

11 A. Yes.

12 Q. Let's go to 22-H. What do we have here?

13 A. H is the point at which the cavity above --

14 MR. POOLE: Your Honor, for the record I think
15 it's 22-I.

16 MR. HIBEY: You are right.

17 THE WITNESS: Yeah, I think it is I. That's why
18 I was confused.

19 MR. HIBEY: Thank you, counsel.

20 A. Do you want me to explain?

21 Q. Please.

22 A. This is the case where the corrosion, due to
23 metaboric acid, has increased the size of the subsurface
24 cavity so that it finally uncovers not only the crack that
25 was leaking but also the crack that existed in the J-Groove

1 weld.

2 Now, this is important in our analysis because
3 this changes the leakage rate significantly from on the
4 order of .02 gallons per minute to approximately .15 to
5 .17 gallons per minute. That increase in leakage rate
6 significantly changes the parameters or the conditions, if
7 you will, within the cavity.

8 Q. In what respect?

9 A. Well, most significant here is the fact that we
10 have a very high leakage rate that results in the face
11 change from liquid to steam that is incomplete. So rather
12 than evaporating all the water, we actually only evaporate
13 somewhere between 30 and, what, 20, 30 percent of the
14 water. So there's a large fraction of water that remains.
15 The evaporation of that water expands the volume because
16 you're using steam, and that expansion accelerates the
17 remaining water droplets. Those remaining water droplets
18 get accelerated to very high velocities and change the
19 mechanism of material removal from purely a chemical
20 material removal to one of the mechanical material removal.

21 Q. So as you have described. Corrosion is a
22 chemical activity?

23 A. Yes.

24 Q. You are now describing a mechanical activity as
25 well?

1 A. In addition to the corrosion, yes.

2 Q. Where in this exhibit should we look, which is
3 now 22-I, for the evidence of the mechanical activity that
4 accompanies the corrosion that's going on?

5 A. Well, the mechanical activity would be
6 prominently an area where the highest velocity is, and
7 that's the region down here, and the velocity is actually
8 going to be coming out from the crack so it's all going to
9 be directed outward. And we found that this is consistent
10 with the evidence identified in the shape of the final
11 wastage cavity and its orientation on the head, and the
12 damage condition or the service condition or morphology of
13 the surface when it was inspected by BWXF in their
14 analysis.

15 Q. Now, in this particular exhibit, you've drawn a
16 circle around a point where the mechanical activity is
17 going on in earnest and in a direction with the three lines
18 which signify away from the nozzle; is that correct?

19 A. Yes, this is a representation of the region where
20 the fluid reaches the highest velocity.

21 Q. All right. And that's what I wanted to ask you
22 about. Tell us, what kind of velocity are we talking
23 about? Are we talking about -- you tell us.

24 A. Well, the peak velocities that we see when the
25 face change occurs are on the order of 2,000 feet per

1 second which translates to roughly 1,300 to 1,400 miles per
2 hour, which is about mach II or twice the speed of sound,
3 very quick.

4 Q. And is it -- what is the significance of the fact
5 that liquid is coming out through that crack at that rate
6 and what's happening mechanically?

7 A. These velocities are actually very similar to the
8 velocities that are used for a technique called fluid check
9 cutting or water jet cutting. Water jet cutting doesn't
10 happen at high temperature, it happens at room temperature,
11 but the velocities are comparable. They're on the order of
12 mach I to mach III.

13 Q. Let me -- let's take time out from this, not
14 remove anything from the screen. Let me show you
15 Government's 157.

16 THE COURT: 157?

17 MR. HIBEY: 157.

18 THE COURT: That's been previously admitted, has
19 it not?

20 BY MR. HIBEY:

21 Q. It's previously been admitted so I'm going to --
22 let's just take time out for a second and look at 157.

23 A. Yes.

24 Q. What is 157?

25 A. That appears to be an image of the reactor

1 pressure vessel head with the plug that contained nozzles 3
2 and 11 and the wastage cavity removed.

3 Q. Okay. I want to direct your attention, sir, to
4 the circular hole.

5 A. Yes.

6 Q. Based upon your knowledge and understanding of
7 these processes, how is that hole created?

8 A. According to the report that was completed by
9 BWXT, who did the examination of this plug after it was
10 removed, this plug was removed by water jet cutting.

11 Q. Is that the same process that you are describing
12 when you reference the velocity of the liquid that is
13 creating the cavity in October, November of '01?

14 A. Yes.

15 Q. If I could have 20 -- the 22 Exhibit. Back up.
16 What do I have to do? All right.

17 Now, if I could ask that we move to 22-J, what
18 is -- what does this depict?

19 A. This depicts the representation of the final
20 shape of the wastage cavity. The image on the right is a
21 cutting cross section. The image on the left shows you the
22 subsurface nature of the wastage cavity, and then also an
23 interesting observation is that there's a little bit of
24 dishing near the top if I show you this region right here.

25 Q. Where are you pointing?

1 A. I drew it on the screen.

2 Q. And what is dishing?

3 A. That's actually a manifestation of the different
4 material removal mechanism that caused the majority of the
5 cavity. That, again, is metaboric acid, but this time
6 instead of in the cavity, it's from the top down. The
7 boron and the metaboric acid that was on top of the reactor
8 now gets wet from underneath and so it starts to corrode
9 down. And that's the beginning or that's the manifestation
10 of the top-down corrosion as opposed to the bottom-up
11 corrosion.

12 Q. So are we to understand that both bottom-up and
13 top-down are at work here?

14 A. Yes. But top-down is only operational after
15 we've uncovered the large J-Groove weld and we have ample
16 moisture making it to the surface for that corrosion
17 mechanism to occur.

18 Q. You keep using the word uncover when you talk
19 about the J-Groove weld. What do you mean by the word
20 uncover?

21 A. Okay. You have to understand that when they make
22 the J-groove weld, it's welded to the nozzle material here.
23 It's welded to the cladding material here, but it's also
24 welded to the reactor head material, the alloy steel by
25 welding it. It means it's all melted so there's a

1 metallurgical bond there. So even if the crack in the weld
2 goes all the way through the weld and gets to the reactor
3 vessel head material here, that's actually a hole when it
4 gets to that. It doesn't leak. It doesn't leak because
5 there's no path. It's a metallurgical bond. It gets there
6 and it stops. It's not until the corrosion from above
7 comes down and uncovers the weld that it begins to leak.
8 And our observations of plant data and our crack growth
9 rate model identify that most likely happened in the
10 October, November time frame of 2001.

11 Q. Now, I've just shown you 22, A through J. And I
12 ask you, is this a graphic depiction of the time line that
13 supports your opinion regarding the cavity in this case?

14 A. Yes.

15 Q. In the -- or thank you very much for that. In
16 the course of your study of the wastage event, did you take
17 into consideration the time line that was developed by the
18 writers of the root cause report?

19 A. Yes, we did.

20 Q. Did you agree with that time line?

21 A. We began with that time line and did our
22 analysis, and then ultimately concluded that late in the
23 time line, we do agree that the wastage cavity and the
24 events that occurred in the late part of the cycle 13
25 coincide. But early in the time line, we do disagree.

1 Q. So the aspect of the time line that you disagree
2 with is when the cavity developed, came into existence?

3 A. Predominately prior to the 12th refueling outage
4 is when we disagree.

5 Q. Now, you spoke at length about the J-Groove weld
6 crack that was involved in this particular incident or
7 event. Did the root cause team have that information?

8 A. They did not.

9 Q. When did this information develop?

10 A. The analysis of the plug of material that was
11 removed wasn't completed until over a year after the event.
12 It was mid 2003. So that information, although parts of it
13 may have been available earlier than that to the people at
14 the plant, the root cause report was completed in 60 days
15 after the event. So the original version of the root cause
16 report and its supplements did not have access to that
17 information.

18 Q. Now, I believe you testified also that there was
19 a crack in nozzle three; is that right?

20 A. Yes.

21 Q. How did you come to that conclusion?

22 A. We used the non destructive evaluation
23 measurements that were completed prior to the machining of
24 the nozzle when they were trying to repair it before they
25 knew there was a wastage cavity on the head.

1 Q. Can you explain that further, please?

2 A. Sure, at the 13th refueling outage.

3 Q. That would be in February or March of '02?

4 A. In February of 2002, there was a requirement by
5 the Nuclear Regulatory Commission to inspect all nozzles in
6 plants like Davis-Besse. The Davis-Besse staff had done an
7 inspection of the nozzles and identified with non
8 destructive evaluation ultrasonic testing nozzles that were
9 cracked. That information actually preserved the extent of
10 cracking in the nozzles, and we used that information to
11 develop our final crack lines.

12 Q. Your final --

13 A. Crack lengths, sorry, crack lengths at the time
14 of the February outage.

15 Q. Now, how did this information inform on the
16 question of crack growth?

17 A. Well, this was our starting point. We had the
18 benefit of knowing the end state and also knowing the
19 properties of the material for that specific nozzle.
20 Having calculated the stress states in laying down the
21 J-groove weld and their extent, we were then able to back
22 calculate or step back in time, if you will, as to what the
23 crack lengths may have been at specific points in time.

24 Q. Okay. Now, you say that you were able to look at
25 the crack lengths and study the issue of the stress

1 associated with the material in question; is that right?

2 A. That was a separate analysis, but, yes, that's
3 correct.

4 Q. All right. I want to ask you if your
5 calculations regarding crack growth rate were predicated on
6 industry-wide averages and data or whether they were
7 calculated on the basis of the specific study of the
8 material at -- in the Davis-Besse nozzle.

9 A. Our analysis were based on the specific material
10 for the Davis-Besse nozzle as analyzed by Argon National
11 Laboratory.

12 Q. And tell us a bit about Argon National
13 Laboratory. What was their role in all this?

14 A. Argon is a D.O.E. funded federal laboratory that
15 was contracted by the U.S. Nuclear Regulatory Commission to
16 complete the analysis of the materials removed from nozzle
17 three.

18 Q. All right. So as between industry wide data on
19 the one hand that is not specific to any material that came
20 out of Davis-Besse and material analyzed from the
21 Davis-Besse nozzle, which, in your opinion, is the more
22 reliable information?

23 A. Okay. May I predicate that with a statement?

24 Q. Please.

25 A. You have to realize that the Davis-Besse data

1 falls on the same distribution as all of the industry data.
2 If you take all the cracking data that has been derived
3 for -- at this alloy and you plot it and maybe it will look
4 like a mill curve. The industry average, or the industry
5 number that's used is the 75th percentile, the measured
6 values that we get for the Davis-Besse specific material
7 are at the 95th percentile. So they're significantly
8 higher crack growth rates, but they still fall on the same
9 distribution, but it makes sense to use the real data that
10 you know as opposed to an industry average because the
11 industry average includes materials that perform better
12 than the heat of alloy that was used to make these nozzles.

13 Q. Now, in that respect, was there a certain
14 modeling done on the material taken from Davis-Besse?

15 A. We used the results of the tests to develop a
16 curve that was used to identify crack growth rate as a
17 function of stress intensity, which is the modeled stress
18 that we have for the weld itself and the adjacent nozzle
19 material.

20 Q. Now, if I can try and put that into my mind. Did
21 you develop a model to determine the stress factor
22 associated with the broken piece in the J-Groove weld?

23 A. We developed a model to determine the stress of
24 the as-fabricated weld. So we actually did a computer
25 model, mathematical computer model of the stresses as the

1 weld was fabricated, and we selected a 13 pass weld.

2 Q. Stop right there.

3 A. Sorry.

4 Q. A what is a pass weld?

5 A. When you make a weld, you lay down a bead of
6 metal and so to fill a big hole. You have to go over it
7 and over it and over it to lay down more beads of metal.

8 Q. All right. How many beads of metal did you
9 understand were passed to make the weld in the J-Groove
10 weld that was on your study?

11 A. In our analysis, we originally tried to get
12 drawings that are called shock travelers, that would be the
13 drawing that follows the reactor pressure vessel head as
14 it's manufactured. Our attempt to do that was so that we
15 could figure out how many weld passes were there. We were
16 unsuccessful in finding those. They apparently weren't
17 archived with that amount of detail. So then we looked at
18 the metallography from the examination by the BWXT report
19 and identified that there were more than ten weld passes.
20 And part of that weld had been machined away, so you
21 couldn't be entirely accurate as to how many there were.

22 And there was another set of studies, one done by
23 Dominion Engineering where they model, discusses two weld
24 passes and one done by a company called EMC. It's
25 Engineering Mechanics Company of Columbus. They worked for

1 the Nuclear Regulatory Commission to model the stresses in
2 J-Groove weld in reactor pressure weld penetrations. That
3 study used 13 passes. They also used a number of other
4 passes up to 27 passes to model the J-Groove weld. But a
5 majority of this work was done at 13 passes because the
6 more positions you get, it didn't make a difference in the
7 remaining residual stress in their calculations. So we
8 settled on 13 passes to model this weld and then identify
9 the resulting residual stresses that were there.

10 But we didn't stop there. We then said, well,
11 this has undergone other stress. One of the tests that's
12 done on a reactor pressure vessel is to take it to about
13 150 percent of its regular capacity. So instead of 2,000
14 pounds, it goes to 3,000 pounds. Actually, I think it went
15 to 3,500. It goes to about 150 percent of the rating
16 capacity that reduces stress on the welds.

17 In addition to that, we also have operating
18 stresses. The stress of operating over the years at
19 2,200 pounds per square inch, which is the operating
20 temperature -- or excuse me, pressure of the reactor.

21 Q. Did you consider that the numbers you were using
22 were artificial and out of touch with what the actual
23 experience of stress would have been in this particular
24 containment?

25 A. We did not.

1 Q. And why is that?

2 A. Well, we made comparisons to other studies of a
3 similar nature, and we also made comparisons to work that
4 had been done by the Electric Power Research Institute,
5 EPRI, and their determination of typical stresses in
6 J-Groove welds and our stresses were, at most, about half
7 of their peak stresses. So we were -- we felt we were
8 within the realm of reality as to what the stresses might
9 be.

10 Q. Now, did you have occasion to study the analysis
11 of the cavity itself?

12 A. Yes. We had the benefit of evaluating the report
13 that was written by BWXT, in their analysis of both
14 metallurgical and physical examination of the cavity as it
15 was removed from the reactor pressure vessel head.

16 Q. And when I showed you Government's 157 before to
17 demonstrate the hole that was in the picture created by
18 water cutting, is that the cavity that was -- is that where
19 the cavity was?

20 A. Yes.

21 Q. And was that what was taken out by BWXT --

22 A. Yes.

23 Q. -- and studied. Now, what characteristic did the
24 cavity have?

25 A. One of the most important interesting points of

1 observation of the cavity was the orientation of the large
2 wastage cavity. It was aligned with the J-Groove weld --
3 the J-Groove weld crack, excuse me. The J-Groove weld
4 crack was not straight downhill towards nozzle 11. It was
5 about 10 degrees off straight downhill axis. And the
6 wastage cavity and sort of the end of the football shape
7 was directly in line with that 10-degree off axis crack.

8 Q. We heard the words. Let's see if we can
9 understand that a little bit more. Do you see this model
10 that's right here in front of the jury?

11 A. Yes, I can.

12 Q. Would that be useful? I can't remember the
13 government's number, 126. Would this be useful to describe
14 what you're doing?

15 A. Sure.

16 Q. What you were talking about?

17 A. Sure.

18 Q. Let me show you 126. Okay?

19 A. Okay.

20 Q. And if you could describe to the ladies and
21 gentlemen of the jury what you were testifying about
22 concerning the 10-degree offset.

23 A. Well, this is sliced directly down the middle, so
24 if 0 degrees is down at the bottom and 180 degrees is up at
25 the top, and if you look at it from above, and we went

1 clockwise -- if we go 10 degrees clockwise, that's the
2 location of the crack in this J-Groove weld -- excuse me,
3 I'm sorry. It's down here, this J-Groove weld. So the
4 crack is actually oriented 10 degrees clockwise if you're
5 looking down from the top. And that's also the center, if
6 you will, of the football point in the cavity that's
7 formed.

8 Q. That you described in your -- in the graphic?

9 A. Yes, it's the large cavity that's the final
10 version of our -- our wastage cavity.

11 Q. So what is the significance of the fact that this
12 thing was 10 degrees off?

13 A. If it were only formed by acquiesce corrosion --

14 Q. What's that?

15 A. That's boric acid in water. One would expect
16 that it would go straight downhill, not be 10 degrees off
17 axis, so, so. That was our first indication that we have
18 something else happening. And so the first thing we looked
19 at was maybe it's flow assisted corrosion. Flow assisted
20 corrosion is when -- when things corrode. They get rust on
21 them and sometimes the rust protects. If I have flow and I
22 wash the rust away, it can corrode faster, and that's
23 flow-assisted corrosion. But the flow velocities -- it
24 happens in pipes a lot. But the flow velocities are
25 usually 10 to maybe 40 feet per second, not 2,000 feet per

1 second. So we kind of ruled out flow-assisted corrosion
2 until things slowed down more, and then we started to look
3 at other means.

4 And to be perfectly honest, we didn't settle on
5 mechanical removal by water jet cutting or aggressive water
6 jet cutting or fluid jet cutting until after we saw the
7 geometry issues and we saw the surface morphology of the
8 wastage cavity as depicted by the BWXT report.

9 Q. So this -- this is -- what then is the
10 significance of the characteristic you've just described?

11 A. Okay. The cavity formation is driven by the flow
12 of fluid coming from the crack which happens to be at very
13 high velocities. It encompasses both mechanical material
14 removal by fluid jet cutting and some metaboric acid
15 corrosion. Probably not acquiesce corrosion. And I'll
16 tell you in a side, just because we wanted to check this
17 out.

18 The last section of our report, we took a lot at
19 what if we have the final cavity and we fill it up with
20 liquid boric acid. Then we all of a sudden turn on the
21 leak and see what happens. The analogy that I can draw
22 here, it's like when you try to fill your bird bath, my
23 grandpa used to fill the bird bath and he would take the
24 hose and squirt it all out at high velocity, but you can't
25 fill it with high velocity. You have to go slow. When we

1 did the analysis with the cavity completely full of liquid,
2 all of the liquid was ejected because the fluid velocity
3 were so high that everything was ejected from the cavity.
4 So our estimate, based on the final geometry of the cavity
5 and the final leak rate, is it was a very aggressive
6 environment but not an environment that was filled with
7 liquid boric acid.

8 Q. So how many processes were at work to create the
9 wastage represented by the cavity?

10 A. There were multiple processes. There was
11 mechanical removal of material by either a liquid jet or a
12 liquid jet that incorporated some of the corrosion product
13 or boric acid particles which become abrasive. It was
14 metaboric acid corrosion which you identified at the bottom
15 of the small annular cavity but also at the top of the
16 cavity and on the interior walls of the existing cavity.
17 There was flow-assisted corrosion, to some extent, toward
18 the end when velocities were slower at the periphery.
19 There was metaboric acid from the top down.

20 So we think we've -- we've put together a pretty
21 complete picture of the types of material removal based on,
22 one, our modeling, but, two, on the physical conditions of
23 the cavity at the end state. It makes sense that the
24 orientation is correct. The surface damage on the walls
25 matches what we expect it to be, and then also the dishing

1 on the top with the metaboric acid are all well founded in
2 our scenario and time line.

3 Q. In the course of describing the various processes
4 that were at work, if I understand correctly, you described
5 metal removal by jet impingement?

6 A. Correct.

7 Q. That would be like the hole that was cut in
8 Government's 157?

9 A. Similar mechanism, yes.

10 Q. Then you said something about abrasive water
11 cutting. What is abrasive water cutting?

12 A. Okay. In the industry, when they want to cut a
13 big hole like the plug that was removed, they put water at
14 high pressure. And by high pressure, we're talking
15 40,000 pounds per square inch which is much -- you know, 20
16 times more than the 2,000 pounds per square inch that we
17 have in the reactor. So 40,000 pounds per square inch, and
18 before they let that water out of the little hole called an
19 orifice, they introduce abrasive materials, like they
20 actually use ruby crystals sometimes. And the abrasive
21 material then is incorporated into the water stream,
22 strikes the metal and is both the water and the abrasive
23 material that cut away, if you will, the metal.

24 Q. Why do you say that there was abrasive water
25 cutting going on?

1 A. Our observations of the surface of the wastage
2 cavity, based on the analysis done by BWXT, showed
3 indications in their scanning electron micrographs of
4 impingement damage, impact damage, where small particles
5 have struck the surface and caused little craters, and
6 that's damage that would be expected from abrasives that
7 are striking the surface.

8 Let me say one more thing. Those abrasives would
9 have been introduced because there's all sorts of junk in
10 that cavity once it started to rust, and once they have cut
11 things out, they can be caught up in the stream. They can
12 be entrained in the stream and then accelerated to high
13 velocities and cause the damage of the cutting that we see.

14 Q. All right. I think everyone will be relieved to
15 know I'll move on to another subject.

16 A. Sorry.

17 Q. Not at all. Thank you, sir.

18 What is flange leakage?

19 A. Flange leakage is the leakage between the two.
20 If you want to show the image there, I can bring it out.

21 Q. Can you do it here?

22 A. Yeah, that will be fine.

23 Q. We're looking at 126, I think.

24 A. Okay. Flange leakage actually occurs when fluid
25 leaks past the gaskets that are put in these little grooves

1 here. And so when fluid leaks past there, it's coming
2 through the flanges.

3 Q. Is it referred to as nozzle leakage?

4 A. Yes.

5 Q. What are the differences?

6 A. Nozzle leakage occurs from the crack that
7 happened in the nozzle. So when -- in our report, when we
8 refer to nozzle leakage, we refer to leakage that comes
9 through the crack and the nozzle down by the J-Groove weld,
10 and flange leakage occurs up at the flange.

11 Q. There is testimony in this case from Dr. Davis,
12 who is sitting in the courtroom here today, that the boron
13 on the head in 2000 could not have been the product of
14 leakage from the D-10 flange. Do you agree with that?

15 A. No.

16 Q. Would you tell the ladies and gentlemen of the
17 jury why not?

18 A. I completed a review of the flange inspection
19 videos for 12 RFO, which was 2000, also a review of the
20 flange groove videos that were taken for the D-10 and F-10
21 flanges. And based on my review of that information, I
22 think that flange 31 or D-10 was leaking precipitously and
23 deposited a great deal of boric acid on top of the mirror
24 insulation above the head and most likely leaked through
25 and deposited boric acid onto the head itself.

1 Q. I want to show you Government 141. Government's
2 141 --

3 MR. POOLE: Your Honor, we'd like to pose an
4 objection to this line of questioning and we think it's
5 appropriate to do it at side bar.

6 (A side bar conference was had on the
7 record.)

8 MR. POOLE: Your Honor, my objection to this line
9 of testimony would be that it was not part of defendant's
10 notice of the testimony this expert was going to present.
11 They essentially said he would be presenting the
12 conclusions of the report, and now he's describing recently
13 performed work, if you will, that was not a part of the
14 notice.

15 MR. HIBEY: I'm trying to rebut what Dr. Davis
16 said. It's what -- when he came out with it, he rebutted
17 it.

18 MR. GORDON: And we identified this witness as a
19 rebuttal witness in disclosure.

20 MR. HIBEY: That's correct.

21 THE COURT: It seems to me that the only
22 opportunity, other than cross examination, for a defendant
23 to rebut that which they are not aware of as yet, but which
24 is later testified to as in Dr. Davis' case, is through an
25 expert who has knowledge in the field who has done work at

1 this particular reactor with respect to the analysis we've
2 already heard and is qualified to testify. I'm going to
3 overrule the objection.

4 MR. POOLE: Your Honor, we take your point. We
5 think it's well made and withdraw our objection, but we may
6 ask for a little more time to prepare for our cross
7 examination.

8 MR. BALLANTINE: Just to note, when he did this
9 review that he's about to testify about, when was that?

10 MR. HIBEY: I'll ask him.

11 MR. BALLANTINE: Do you know?

12 MR. HIBEY: At this juncture, I don't. I'll just
13 ask him.

14 MR. BALLANTINE: All right. Thank you.

15 BY MR. HIBEY:

16 Q. Let me show you Government Exhibit 141.
17 Government's 141 is a photograph -- three photographs taken
18 in '98, '99 and 2000 of the D-10 flange. Have you had an
19 opportunity to examine that particular photograph?

20 A. Yes.

21 Q. Do you recall when the first time was you saw it?

22 A. I think it was an image that was provided to us
23 by -- it was provided to Morgan Lewis by the Department of
24 Justice.

25 Q. Looking at this particular exhibit, what -- I

1 will tell you that there's testimony that this exhibit
2 supports the proposition that D-10 flange was not leaking
3 in '98, '99 and 2000. Looking at that particular exhibit,
4 do you agree with that conclusion which was expressed by
5 Dr. Davis here in the courtroom?

6 A. No.

7 Q. Why not?

8 A. Well, based on the exhibit, it was leaking in
9 1998 because it had leakage that showed up. So there was
10 some leakage. And it was identified in condition reports
11 that we reviewed from Davis-Besse. In the images from '99,
12 which is the mid cycle outage, the middle image and the
13 bottom image, which is from the 2000 outage, there's no
14 significant increase in the boric acid deposits, but that
15 does not mean the flange was not leaking. It just shows
16 that the flange was not leaking significantly along this
17 leakage pathway.

18 Q. Well, could there have been other leakage
19 pathways?

20 A. Yes.

21 Q. In the course of your looking into this question,
22 did you determine that there were other leakage pathways?

23 A. There were evidence of other leakage pathways
24 which included a spray event that came from the flanges --
25 from between the flanges on nozzle 31.

1 Q. And excuse me, sir, but what, in your opinion,
2 would have caused this spraying that you just testified to?

3 A. The damage associated with the steam cutting of
4 the gasket grooves.

5 Q. Let me ask you -- more importantly, let me ask
6 Ms. Robinson to play a video which we have seen,
7 Defendant's 14, in evidence. I'm going to ask you to look
8 at this video as it comes up, and I want you to talk over,
9 because we've seen the image before, and we tried to hear
10 the words, but you have seen this exhibit, have you not?

11 A. Yes.

12 Q. Would you tell the ladies and gentlemen of the
13 jury what hopefully in my lifetime you will see? And there
14 it is.

15 A. This is an impact of the F-10 flange, which is
16 nozzle number 11, which was originally identified as the
17 dominant leaker after the flange inspection videos. And
18 you'll see that basically the bottom of the groove and the
19 areas between the grooves that you see here.

20 Q. Can you -- can you --

21 A. The grooves are here, this is one of the grooves
22 right here, and this is the other groove down here.

23 Q. Yeah.

24 A. Okay. And so that basically is the bottom
25 surface, if you will, that has to be smooth so the gasket

1 works. In addition, you're interested in, you know, what
2 does the surface look like in between the grooves here and
3 what does it look like outside of the grooves because that
4 gives you an indication of flow. In this case, they're
5 pretty -- they're in pretty good shape. And if you listen
6 to the audio, they not -- they don't want small pit, but
7 this flange, according to the work orders and the non
8 conformance reports that were documented by Davis-Besse
9 personnel, was just put back together and reused. It did
10 not have to be repaired.

11 In a minute, we're going to get back -- we just
12 went back to look at that. I'm sorry, I should have showed
13 you that. It's okay. We're going to jump to the next
14 nozzle, and the next nozzle is markedly different. This
15 would be D-10 or nozzle 31. And if -- I think we're almost
16 there. So we'll be patient, Mr. Hibey, if you don't mind
17 because I don't want to miss the transition.

18 There we go. Okay, this is the next nozzle. And
19 of significance here, even early on, you can see down
20 here -- and I apologize for covering it up, but there's
21 pitting, and there's erosive wear, if you will, which is an
22 indication that there is some leakage. And as we go
23 further around, we're going to see evidence of steam
24 cutting, so the evidence of pitting in the grooves and
25 steam cutting on the flange surfaces signifies significant

1 leak pathways. We're going to see it better when it comes
2 up here on the top. We have damages associated right out
3 here. We have damage along the bottom. I'm sorry, it's
4 not -- okay. I'll try that again. And this kind of goes
5 by fast but you'll note -- you'll notice that there's
6 damage down in this region here, and the damage was deemed
7 so significant that this flange had to be repaired prior to
8 being put back in use. So they had to put a lathe on it
9 and remove material and make a new set of grooves.

10 I guess the other significant part that should be
11 mentioned is that if you looked at the entire circle and it
12 was documented better in what we'll call non conformance
13 reports, about 300-degrees of 360, so 5/6 of the entire
14 circle had areas with noted damage, so this gives us wide
15 range of leak paths.

16 Q. What would you expect the effect of the steam cut
17 to be on the area where it leaks?

18 A. Well, the steam cut would begin small. And as it
19 begins small, it would just be a very small leak where you
20 get the type of deposit you saw on those images. As the
21 steam cut progresses, it gets larger, the flow is greater,
22 and rather than just dribbling out, it would be spraying
23 out. And you can take a look at the pattern of boron
24 deposit above on the mirror insulation and see the
25 direction of spray that must have been coming from nozzle

1 31 since it was the only nozzle that was deemed to be
2 leaking.

3 Q. Have you been able to account for the path of the
4 leakage from the steam cut you just identified in the D-10
5 flange?

6 A. Yes. From my inspection of the flange inspection
7 videos that were done above the mirror insulation.

8 Q. Would you be kind enough to turn to
9 Exhibit Defendant's 29.

10 A. Yes.

11 Q. All right. Can you identify Defendant's 29 for
12 me?

13 A. Yes, this is a reactor vessel head map that shows
14 the location of the nozzles on the head and actually shows
15 all the studs too, 1 through 60.

16 MR. HIBEY: May I respectfully move this into
17 evidence, Your Honor?

18 MR. POOLE: No objection.

19 THE COURT: It will be admitted.

20 BY MR. HIBEY:

21 Q. I'm going to display this exhibit. Let me ask
22 you, sir, using this exhibit, Defendant's Exhibit 29, which
23 is a head map of the Davis-Besse vessel head, could you
24 plot the direction and the disbursement of the boron that
25 came out of the steam cut in flange 10 over nozzle 31 in

1 the year 2000?

2 A. Yes. You have to understand how this inspection
3 that I looked at was done. Inspection of the flanges are
4 done with a camera that's lowered on a pole. And there are
5 actually two cameras. One camera is meant to look straight
6 at the edge of the flange where the gap is between the
7 flanges, and one is expected to look underneath. So they
8 have a camera with a -- actually, it's a camera that's
9 focused on a mirror that's at about 45 degrees so they can
10 look underneath to see if there's leakage. So that's how
11 they got the pictures that I just showed you with the
12 little leak passed on it.

13 In 12 RFO, which is when this happened, there are
14 a number of areas where they couldn't get the camera down
15 to look at the -- low enough so that the top camera could
16 look straight at the side of the flange. There were boron
17 deposits that were underneath it.

18 Now, these boron deposits were noted in the root
19 cause report as being in this location here.

20 Q. When you say this location here --

21 A. I'm going to circle it on the map here.

22 Q. Please be more descriptive for the record.

23 A. In between nozzles 1, 3, 7 and 4, so right in
24 there. Okay. And then between nozzles 6, 3, 13 and 15,
25 and nozzles 10, 11, 27 and 32. Oh, there's a good dot.

1 And then also right here between nozzles 15, 31 and 11. So
2 what -- so those four locations were where they've had
3 difficulty getting the camera to fit.

4 Now, they also had difficulty getting the camera
5 to fit under this region right here 5, 1, 4 and 8 as well
6 as 20, 13 -- I just -- 20, 13, 5 and 9. And finally, they
7 had trouble getting the camera in the location of 31, 27,
8 47 and -- is that 51? I can't quite read it here, I think
9 it's 51. So there were seven different locations under
10 which they couldn't get the camera down because of the
11 boric acid deposits.

12 Now, if you drew a line from nozzle 51 all the
13 way up to nozzle 20, came down and then went all the way
14 back down again, in this region right here -- I guess I
15 didn't do that very well. They inspected at that location.

16 Q. That location meaning?

17 A. This top one by 20, this one down here by five.

18 Q. Yeah.

19 A. They did it by three, I'm doing it here, 6, 31,
20 okay. I'm having difficulty getting them all in. All the
21 seven that I just noted and are in the transcript are
22 places they looked and had difficulty. Every other place
23 that's not marked here, they didn't look. So I don't know
24 if there was boron there or not. But the concern that I
25 have is that if the boron were to be emanating from a crack

1 in nozzle three, how did it get behind nozzle three on top
2 of the head above the mirror insulation? In my engineering
3 judgment, it had to come from somewhere else. It didn't
4 come from a crack in nozzle three. It came from the spray
5 of nozzle 31 over the entire head in that region, that box
6 that I just drew you.

7 Q. Now, there's been testimony in this case that
8 that proposition is -- that there wasn't D-10 flange
9 leakage because there were no stalactites evidence in the
10 areas where you would expect. Do you agree with that?

11 A. I'm sure there were no stalactites because
12 stalactites are formed at a very low leak rate where you
13 can have evaporation occur, and the boric acid's left
14 behind. In this case, I have a spray that's going to come
15 out at relatively high velocity, but it's also not going to
16 be all steam. It's going to have liquid in it because the
17 leak rate that you can estimate for the flange at nozzle
18 31, D-10, is relatively high.

19 Q. So what happens when you have a high leak rate
20 and --

21 A. You don't --

22 Q. -- and a spray that's going out?

23 A. I'm sorry, you don't have a chance for
24 stalactites -- stalactites and stalagmites to form. It's
25 sprayed out and it's a liquid that's -- it's not going to

1 form the stalactites that are hanging down because the --
2 the fluid leaves before it has a chance to drip down.

3 Q. Sir, can the boron on the mirror insulation be
4 explained by a nozzle leak?

5 A. Not in my opinion.

6 Q. Why not?

7 A. I don't see how it's physically possible for
8 boron from the nozzle leak or nozzle crack in nozzle three
9 keeping in mind that -- that the crack is between nozzle 3
10 and nozzle 11, and for that leak to produce a boron deposit
11 above the head and behind nozzle 3, which is the deposit
12 that you would see near nozzles 29, 5 and 13. I don't know
13 how boron could get there from a leak from nozzle 3.

14 Now, additionally, if you went the other
15 direction way down by nozzle 31, I'm not sure how it would
16 get there either.

17 Q. Let me ask you to turn to Defendant's 23.

18 A. Yes.

19 Q. Can you identify Defendant's Exhibit 23?

20 A. Yes, this is a schematic of the general
21 arrangement of the Davis-Besse nozzle showing the mirror
22 insulation above the reactor head and then nozzle fitting
23 above that.

24 MR. HIBEY: May I expect to move that into
25 evidence?

1 MR. POOLE: Which one is that?

2 MR. HIBEY: 23, sir, Defendant's 23.

3 MR. POOLE: No objection, Your Honor.

4 THE COURT: Defense 23 will be admitted without
5 objection.

6 BY MR. HIBEY:

7 Q. Showing you Defendant's Exhibit 23, can you
8 identify this drawing?

9 A. Yes, this is a figure that represents the general
10 arrangement of the nozzles at Davis-Besse, and it was also
11 a figure in our exponent report.

12 Q. Where is the mirror insulation depicted in that?

13 A. The mirror insulation is right here, this region
14 right here. Okay.

15 Q. And so when you're referencing the presence of
16 boron on the mirror insulation, where would that be?

17 A. It's up here in these regions because the camera
18 is lowered down here, and it's interfered with by a mound
19 of boric acid such that they couldn't look at the camera
20 underneath.

21 Q. And where would the nozzle leak be that has been
22 discussed in terms of nozzle 3?

23 A. The nozzle 3 leak is down here, keeping in mind
24 this is, you know, sort of the underside of the reactor
25 head. So the nozzle leak is actually down in this region

1 right here.

2 MR. HIBEY: What is The Court's pleasure?

3 THE COURT: Ladies and gentlemen --

4 MR. HIBEY: The Court's pleasure is to cut my
5 head off?

6 THE COURT: Upon the appropriate signal from The
7 Court to defense counsel, we'll take a break now for our
8 lunch. One moment, please.

9 (A side bar conference was had off the
10 record.)

11 THE COURT: Ladies and gentlemen, we'll take an
12 hour and 15 minutes for lunch. Please remember my previous
13 admonitions to you not to discuss this case among
14 yourselves nor with anyone else or permit anyone else to
15 discuss it with you. Do not read, listen to or watch
16 anything touching upon this case in any way, and do not
17 make up your minds on the ultimate issues you will decide
18 at the end of the case. Enjoy your lunch.

19 (A brief recess was taken for lunch.)

20 THE COURT: Mr. Hibey, please continue with
21 direct.

22 MR. HIBEY: Thank you, Your Honor.

23 BY MR. HIBEY:

24 Q. Dr. Bullen, I'd like to put in front of you this
25 screen, whoops. Government's 144, which are pictures taken

1 from 3-Mile Island. And 145, which is a photograph taken
2 from a nozzle at Ocone, another nuclear power plant.

3 And then lastly, I want to put in front of you
4 Government's 146, a picture from the Davis-Besse head in
5 1996. Now, keeping in mind 144, 145 and 146, would you
6 agree or disagree that the photograph of Davis-Besse's head
7 in Exhibit 146 is evidence of spaghetti-like deposits?

8 A. It's difficult to tell from the appearance of the
9 picture. They look like strands.

10 Q. Let me ask you something about your understanding
11 of what spaghetti like deposits and formations are. Have
12 you come to make any conclusions about how such formations
13 occur as existing in, for example, 144?

14 A. The proximity of the spaghetti deposits to the
15 nozzles suggest that that's where they originated.

16 Q. Well, how does spaghetti form?

17 A. Well, I'm not a detailed crystallographer, but in
18 my review of the crystallization of boric acid from
19 exclusions, basically the crystal nucleides and it grows.
20 And there have been instances where the nucleation
21 basically occurs on a surface from the solution and you can
22 get crystal structure that looks similar to that shown in
23 all of these images.

24 Q. Do you know whether there was any analysis done
25 of the material that is shown in 146?

1 A. Not to my knowledge.

2 Q. Can you, on the basis of the photographs alone in
3 144, 145 and 146, but particularly in 146 -- let me direct
4 you to 146. Can you, from that photograph, tell whether,
5 in fact, this is spaghetti boron?

6 A. I can infer the shape. I can't tell the location
7 of the origin of the spaghetti. If that's what you want to
8 call it.

9 Q. Well, would you call that spaghetti in 146?

10 A. I haven't done a detailed analysis. It doesn't
11 look at -- it's similar to but I wouldn't say that's
12 exactly the same as spaghetti that's shown in previous
13 images.

14 Q. From that photograph. Is it possible that this
15 material could have been knocked loose?

16 A. Yes.

17 Q. Can spaghetti form at room temperature?

18 A. Crystals of boric acid are -- have been known --
19 can form at room temperature from a solution, yes.

20 Q. Can they form on stainless steel?

21 A. Yes.

22 Q. Is there any stainless steel in the reactor
23 vessel?

24 A. Yes.

25 Q. Where?

1 A. The tops of the nozzles above the mirror
2 insulation have a transition where the top structure is
3 stainless steel, and the entirety of the mirror insulation
4 and its support structures are stainless steel.

5 Q. Let me direct your attention to containment air
6 coolers. Where are they located?

7 A. The containment air coolers in the Davis-Besse
8 plant are located in the elevation about 30 or so feet
9 below the level of the support service structure for the
10 control rod drive mechanism, which means they're about
11 30 feet below and off to the side of the level of the
12 nozzles.

13 Q. What, according to your study of the situation,
14 was found on the containment air coolers?

15 A. The containment air coolers began to foul during
16 cycle 12. And by foul, I mean there were accumulations of
17 the boric acid on the condenser coils of the coolers and
18 such that it precluded flow of the gases through the
19 coolers and limited their operation.

20 Q. Is the presence of that foul material on the
21 containment air coolers consistent with nozzle leakage to
22 the exclusion of any other leakage?

23 A. No.

24 Q. Could you explain why that's not the case here?

25 A. Well, the majority of the boric acid deposits

1 which cause the foul were the result of the purposeful
2 rupturing of the ruptured discs on the pressurizer coat
3 safety release valve system that happened in October of
4 199 -- 1998.

5 Q. Let me, first of all, come back to 22-A for a
6 moment.

7 A. Yes.

8 Q. Defendant's 22-A. You just talked about the
9 purposeful destruction of a disc on the safety valve; is
10 that correct?

11 A. Yes.

12 Q. Would you be kind enough to point to the ladies
13 and gentlemen of the jury on this particular schematic
14 where the safety valve is?

15 A. It's right here. That little red dot above there
16 that I almost circled is the pressurized code safety
17 release valve.

18 Q. Can you do me a favor and try to circle it again?

19 A. Sure.

20 Q. All right. Now, what is your understanding
21 regarding the deliberate rupture of the disc on the safety
22 release valve?

23 A. There was a seismic analysis that was done.

24 Q. Stop right there. Seismic meaning?

25 A. Response to earthquakes.

1 Q. Okay.

2 A. And it was determined that these ruptured discs
3 may not operate appropriately, so they were purposefully
4 failed or slit so that any time the safety valve cycled,
5 there were opportunities for the release of steam. This
6 release of steam included -- it's from water from the
7 reactor system, so that included boron, and so the
8 unidentified leak rate increased significantly after the
9 failing purposefully of these ruptured disks.

10 Q. And what happened as a result of the unidentified
11 leak rate? I mean, what was the boron effect of that?

12 A. Well, the -- the steam that was released, some of
13 it condensed on the condenser cooling coils and deposited
14 boron, but the upshot of what happened was the unidentified
15 leak rate, since the release of this steam could not be
16 quantified, increased throughout the middle portion of
17 cycle 12, such that the plant was forced into a mid cycle
18 shutdown because the unidentified leak rate approached
19 their limit for ability. The tech spec limit for
20 unidentified leak rate is 1 gallon per minute. And the
21 unidentified leak rate after the slitting of these ruptured
22 disks approached were 8/10 of a gallon per minute. So in
23 the cycle of 12, it brought the plant down for power and
24 then repaired -- basically made the changes necessary to
25 make it seismically safe and reinstall ruptured disks.

1 Q. Hold it right there. Now, I want to show you
2 Defendant's Exhibit number 24. Can you -- can you turn to
3 it?

4 A. Sure. I'm sorry.

5 Q. Can you identify this document?

6 A. Yes.

7 Q. What is it, please?

8 A. This is a graph of the monthly average
9 unidentified leakage from cycles 10 through 13 for the
10 Davis-Besse nuclear reactor.

11 MR. HIBEY: And may I respectfully move this into
12 evidence? Have you seen it?

13 BY MR. HIBEY:

14 Q. What's the source of this information?

15 A. This figure was presented in the exponent report,
16 but it's also shown on page 19 of the root cause report
17 without attribution. There's no figure number ascribed to
18 it.

19 MR. POOLE: No objection, Your Honor.

20 THE COURT: What's the exhibit number again,
21 please?

22 MR. HIBEY: Defendant's 24, Your Honor. And I'm
23 publishing --

24 THE COURT: Yes, it can be admitted without
25 objection, and you may publish it.

1 MR. HIBEY: Thank you.

2 BY MR. HIBEY:

3 Q. Let me put before you Defendant's Exhibit 24 now
4 in evidence. Would you be kind enough to explain what
5 we're looking at here.

6 A. Yes. The unidentified leak rate for the reactor
7 is tabulated daily. This is an average of all those
8 tabulations for each month for the cycles 10, 11, 12 and
9 13. The areas where there's a blank --

10 Q. All right. Use the screen.

11 A. The areas where there's a blank, like right here
12 and right here -- I'm sorry, I'm not hitting the blanks
13 very well. Let me try that again. There and there. Those
14 represent the refueling outages where the reactor is not
15 operational so there's no leakage. And would you like me
16 to continue?

17 Q. Please.

18 A. Okay. Of interest here is the fact that the
19 unidentified leak rate in cycle 13, which is this cycle
20 right here, significantly increased from sort of --

21 Q. What cycle number is that, please?

22 A. I'm sorry, 12. I'm sorry, cycle 12. This is 13
23 over here. In cycle 12 significantly increased from the
24 background level of about .03 gallons per minute. And due
25 to the ruptured discs being ruptured approached 1 gallon

1 per minute which necessitated the mid cycle outage.

2 Of particular interest here, though, is that the
3 ruptured discs were not breached until late October of
4 1998, which would be this line right here. So the
5 unidentified leak rate was increasing in September and
6 August from the background of about .03 gallons per minute.

7 Also of significance here is after they repaired
8 the ruptured discs, the unidentified leak rate didn't go
9 back down to a level that was the background. It went down
10 to a level that's kind of around .2 gallons per minute. We
11 ascribed that to leakage associated with the flange at
12 nozzle 31 or the D-10 flange.

13 Q. Well, is there any evidence of the existence of a
14 leak at nozzle 3?

15 A. In the beginning of cycle 12, there is no
16 evidence of a leak at nozzle 3.

17 Q. Then your conclusion about the increased amount
18 of leakage is associated with what?

19 A. Our analysis showed that the crack growth rate --
20 if I can recall our discussion from this morning, the crack
21 growth rate was such that even at the end of cycle 12 at
22 the 12 RFO, the crack was only about a half an inch above
23 the weld. And the leak rate was not measurable on this
24 scale. Our calculated leak rate from our model was
25 .0004 gallons per minute. And so if you try to plot that

1 on this curve, you wouldn't see it. It would be the bottom
2 of the line. So this leak rate we ascribe to flange
3 leakage.

4 Q. And what amount of leak -- leakage or what
5 quantity of leakage would result as a result of the flange
6 leaking of this kind?

7 A. We took a look at the boric acid concentration
8 for a typical operating cycle in the Davis-Besse plant, and
9 the boric acid concentration changes from the beginning of
10 cycle to the end of cycle. And so depending on when the
11 nozzle 31 flange was leaking, if it only began leaking at
12 the end of the mid-cycle outage and leaked until the
13 refueling outage, it would deposit approximately
14 1,800 pounds of boric acid inside containment. If it
15 leaked throughout the entirety of the cycle, it would
16 deposit roughly 4,500 pounds of boric acid based on the
17 concentrations of boric acid throughout the cycle.

18 Q. Now, I want to discuss with you radiation monitor
19 filters.

20 A. Yes.

21 Q. What do you understand to be the history in the
22 plant of the change out of filters from '98 to 2002?

23 A. The filters are routinely changed, but in the
24 1998 time frame, especially after the mid-cycle outage,
25 there was an increased frequency in plugging up the

1 filters. That frequency basically denoted that they were
2 white, they had boric acid crystals in them that later on
3 in the cycle they also noted that there were some deposits.
4 These deposits included brownish color deposits, I guess is
5 the best way to put it. The plant collected samples of
6 these filters with the deposits, sent them for analysis at
7 Southwest Research Institute. Southwest Research Institute
8 completed an analysis and identified iron oxide as one of
9 the constituents and also identified copper and chlorine
10 and potassium and a little bit of zinc, and those were
11 perplexing finds in the filter materials.

12 Q. Well, is it consistent with nozzle leakage that
13 you would find those particular chemicals in a deposit?

14 A. No.

15 Q. Why is that?

16 A. Those chemicals are not present in the reactor
17 coolant system. There's no part of the reactor coolant
18 system that contains copper. In addition, no chlorine
19 would be involved in the reactor coolant system because
20 chloride ions cause stainless steel materials like the
21 liner material to fail for stress corrosion cracking. And
22 the presence of the copper and the zinc, that's another
23 ancillary one suggested in one of the condition reports
24 that they may be due to corrosion in the ductwork and coils
25 of the containment air cleaner system.

1 Q. Based on your testimony here today and taking
2 into consideration the areas that you've covered, what are
3 the conclusions you've reached regarding nozzle 3 and the
4 existence and development of the cavity?

5 A. Based on our analysis, when we started with the
6 calculation of the stresses that were produced when the
7 nozzle was manufactured, using the crack growth rate from
8 the measurements done by Argon National Laboratory, and
9 then determining the crack length as a function of time
10 working backwards, we were able to identify the most
11 probable time that the crack reached above the J-Groove
12 weld as mid 1999 by the refueling outage in -- at RFO 12.
13 In mid 2000, the crack had extended to about half an inch
14 above the nozzle, and, as I mentioned, was leaking at a
15 rate of .0004 gallons per minute. A very small leakage
16 rate.

17 Now, there may have been some small material
18 removal associated with that leakage rate, but there was no
19 major subsurface cavity. In mid 2001, the wastage cavity
20 that we showed in the previous figure was the type of
21 wastage cavity and size that we would have seen -- again,
22 it's a subsurface wastage cavity caused by the environment
23 that happens in the annulus due to the flow and the release
24 of reactor coolant system.

25 By mid 2001, that cavity had started to get

1 larger, such that there's an acceleration in the metaboric
2 acid corrosion so that finally in November, October,
3 November time frame of 2001, we uncovered the weld crack.

4 The significance of weld crack is that it was a
5 very large crack that was preexisting. When you corroded
6 away the material over it, the leakage rate significantly
7 increased and the vast majority of the subsurface, and the
8 wastage cavity that was formed occurred from October 2001
9 until the February, March time frame of 2002.

10 Q. One last question. Did the whole process stop,
11 or was it stopped at the time of discovery in February,
12 March of 2002?

13 A. The actual formation of the cavity would probably
14 continue because of the metaboric acid corrosion from the
15 top. But an interesting point of reference is that the
16 depth of the cavity, the length of the football nose away
17 from the nozzle was at about the optimum distance for
18 abrasive water jet cutting. Abrasive water jet cutting is
19 only good for velocities of 2,000 feet per second to a
20 depth or thickness of steel to about 8 inches, and it was
21 about 8 inches deep. Would it continue to grow through
22 other mechanisms? Probably. Would it have been the
23 unmechanical removal, it would have been a less dominant
24 mechanism.

25 MR. HIBEY: No further questions on direct

1 examination.

2 THE COURT: Thank you. Anything from Mr --

3 MR. GORDON: No. Sorry, Your Honor.

4 THE COURT: Cross?

5 MR. POOLE: Yes, Your Honor. May we ask for a
6 five-minute break to set up computers and documents?

7 THE COURT: Very good. Take a five-minute
8 recess, ladies and gentlemen. If you wish, since you've
9 only been in here for 20 minutes, stand in place, wave your
10 arms, stamp your feet.

11 MR. POOLE: We're ready, Your Honor.

12 THE COURT: Please proceed. Thank you.

13 CROSS EXAMINATION

14 BY MR. POOLE:

15 Q. Good afternoon, Dr. Bullen.

16 A. Good afternoon.

17 Q. How you doing?

18 A. Fine, thank you.

19 Q. I've done a little research on Exponent and it's
20 an impressive company. How many offices does it have?

21 A. Worldwide, I think we have 19, 16 of which are in
22 the United States.

23 Q. And approximately 700 staff?

24 A. I think we may be about 800 by now, but yeah,
25 that's close.

1 Q. And how many of those are Ph.D.'s or doctors?

2 A. I think the number is somewhere between 320 and
3 350.

4 Q. Many disciplines?

5 A. I think we cover about 75 or 80 disciplines.

6 Q. And I understand the company once had its own TV
7 show?

8 A. Not to my knowledge. I'm sorry. I know that the
9 chairman has appeared on Modern Marvels or Engineering
10 Disasters or something like that, but we've had people on
11 television, yes, but I don't think we had a show.

12 Q. So there was a show that referenced what the
13 company did?

14 A. There was a show that made reference to accidents
15 and our experts comment on them.

16 Q. Okay. Thank you. And the company does important
17 work for big clients. Is that a fair statement?

18 A. Yes.

19 Q. Can you give us some examples?

20 A. Well, if you look at our web page, we do large
21 cases and small cases. Our average case is about \$20,000,
22 but we've done some very large cases. As I mentioned, we
23 did the World Trade Center collapse. We did the Hyatt
24 Regency walkman collapse, TWA flight 600 explosion over the
25 Long Island area. Those are some of the high profile ones

1 that our company's been involved with.

2 Q. You mentioned that, correct me if I'm wrong,
3 perhaps in a typical case, Exponent people who are asked to
4 do a failure analysis, are dispatched after failure,
5 though, determined how it occurred?

6 A. That's correct.

7 Q. So were you dispatched to Davis-Besse Nuclear
8 Power Station in March of 2002?

9 A. No.

10 Q. When did -- when did Exponent become involved?

11 A. Exponent's involvement in the Davis-Besse event
12 predates my time with the company. I joined the company in
13 January of 2004. And at that time, Exponent was involved
14 with a different lawsuit. It was the shareholders lawsuit
15 about the -- about the event. And we worked with a
16 different set of counsel, but those were other engineers,
17 some of whom are on my team, but those are other engineers
18 than me.

19 Q. Okay. And in the work that you did for -- for
20 the Exponent report, the report about the wastage event,
21 who was the client?

22 A. The client was First Energy Operating Company.

23 Q. And I think you mentioned Morgan Lewis. Who are
24 they?

25 A. Morgan Lewis is the external counsel for the

1 arbitration claim with the insurance company.

2 Q. Okay. Now, you said at the outset of your
3 testimony that the work you did was for the purpose of
4 determining cause and sequence of events at Davis-Besse?

5 A. That's correct.

6 Q. And but there was this other purpose, which was
7 to support an insurance claim; isn't that true?

8 A. Yes.

9 Q. And that was a claim arising out of the costs
10 associated with replacing the reactor vessel head; is that
11 the case?

12 A. Yes.

13 Q. That's about \$200 million, isn't it?

14 A. I think that's correct, yes.

15 Q. Now, when you -- when you do a report like the
16 one you did for the First Energy Nuclear Operating Company,
17 it's important to be accurate, isn't it?

18 A. Yes.

19 Q. And is that report, to your knowledge, accurate?

20 A. Yes.

21 Q. And if you knew of a mistake in the report that
22 you found out about after the report was issued, would you
23 correct it?

24 A. If it were substantive to the report, yes.

25 Q. Okay. Would you knowingly allow your name to be

1 added to the report knowing that it wasn't accurate?

2 A. My name?

3 Q. Your name.

4 A. No.

5 Q. All right. Let's talk a little bit about the
6 insurance claim aspect. The first page of the report you
7 did says that, among other things, it is created for the
8 purpose of determining certain issues. One is whether the
9 wastage event was foreseeable.

10 A. Yes.

11 Q. And whether the wastage event was expected?

12 A. Yes.

13 Q. Whether the wastage event came from normal wear
14 and tear?

15 A. Correct.

16 Q. Whether the -- whether it developed slowly over
17 many years or quickly?

18 A. Yes.

19 Q. Now, if -- if the corrosion hole developed slowly
20 and/or, in fact, visible during inspections in '98 and
21 2000, the company wouldn't be able to collect on that
22 insurance claim, would they?

23 A. I am not that familiar with the language of the
24 policy so I don't know the -- the thresholds for whether or
25 not the claim proceeds, I'm sorry.

1 Q. Okay. Well, let's go back to those insurance
2 terms. If the -- if the cavity was foreseeable and
3 expected, you wouldn't collect, right?

4 A. I -- I don't know. I assume if that's what the
5 policy -- I'm not familiar. I have not read the policy so
6 I don't know, but I -- I would --

7 Q. But those terms --

8 A. Those terms --

9 Q. -- appear on page 1 of the report?

10 A. Right.

11 Q. And page 1 of the conclusion of the report?

12 A. Correct, yes.

13 Q. And on the last page of the report?

14 A. If you say so. I haven't got the report in front
15 of me, so --

16 Q. And is it fair to say they're sprinkled
17 throughout the report?

18 A. Yes.

19 Q. Now, as a part of the work you did for FENOC, did
20 you attempt to determine the accuracy of the responses that
21 the FENOC made to bulletin 2001-01?

22 A. We reviewed the documentation that was provided
23 to us about FENOC's responsibility -- bulletin 2001-01, but
24 we made no judgment about whether or not their response was
25 appropriate.

1 Q. All right. Let me ask you -- ask you a question
2 about that. Did the report say that FENOC's response to
3 industry and regulatory concerns about CRDM cracking and
4 boric acid corrosion was in accordance with industry
5 recommendations and regulatory requirements?

6 A. Yes.

7 Q. And the bulletin responses, they were regulatory
8 requirements, weren't they?

9 A. Yes.

10 Q. But you didn't attempt to determine whether the
11 bulletin responses were accurate?

12 A. No. Our summary of the information provided in
13 the report was written for an audience, which was the
14 Tribunal of Judges in the arbitration case. And that
15 background information was meant to put our work in
16 context.

17 Q. Okay. All right.

18 MR. POOLE: At this time, we'd like to display to
19 the witness, Your Honor, and to the jury a page from
20 Government's Exhibit 60, which was previously admitted in
21 evidence.

22 BY MR. POOLE:

23 Q. I want to ask you -- ask you a question about
24 this page from the first response the company made to the
25 bulletin 2001-01. That's serial letter 2731. I know it's

1 hard to read. And I'm going to highlight a sentence. The
2 section highlighted says, inspection of the RPV head nozzle
3 area indicated some accumulation of boric acid deposits.
4 And this is referring to the -- to the inspection that
5 occurred in 2000.

6 A. The 12 RFO inspection?

7 Q. Yes.

8 A. Okay.

9 Q. 12 RFO. Now, did you interview any people at the
10 plant as a part of your research?

11 A. No.

12 Q. So you didn't talk to the people who did the head
13 cleaning at the plant?

14 A. No.

15 Q. So for example, you didn't talk to Terry Taber,
16 who was one of the head cleaners?

17 A. No.

18 Q. And he -- he didn't tell you that, in fact, in
19 2000 when they went to clean the head, there was more boric
20 acid?

21 MR. HIBEY: Excuse me, Your Honor. He said that
22 he didn't speak to Mr. Taber.

23 THE COURT: That stops the subject. He didn't
24 speak to him, then he couldn't have told him. So to
25 reiterate his testimony at this time would be

1 inappropriate.

2 MR. POOLE: All right.

3 BY MR. POOLE:

4 Q. So you have no knowledge about whether this
5 sentence is accurate or not?

6 A. I do not.

7 Q. Okay.

8 MR. POOLE: Now, Your Honor, I would like to
9 display a page from serial letter 2735, which is
10 Government's Exhibit 105 previously admitted.

11 THE COURT: Very good.

12 BY MR. POOLE:

13 Q. Now, your -- the report you drafted made
14 representations about the Boric Acid Corrosion Control
15 Procedures that they use at Davis-Besse. Do you recall
16 that?

17 A. Yes.

18 Q. And it made generalizations that they had a
19 procedure and that it was followed?

20 A. Yes.

21 Q. Fair statement? And I'm going to highlight a
22 sentence here.

23 The inspections performed during the 10th,
24 11th and 12th refueling outage -- I'm going to focus on
25 10th here, skipping some language, consisted of a whole

1 head visual inspection of the RPV head in accordance with
2 the DBNPS Davis-Besse Nuclear Power Station boric acid
3 control program.

4 Were you aware that the individual who performed
5 the inspection at the 10th refueling outage in 1996 wrote a
6 condition report or a PCAQ, as they were then called,
7 Potential Condition Adverse to Quality, stating that at the
8 time he tried to do his inspection, he was unable to comply
9 with the boric acid corrosion control program?

10 A. Yes, because I reviewed that PCAQ.

11 Q. 96-551?

12 A. Yes.

13 Q. Now, that PCAQ said that at the time he did that
14 inspection, he was only able to view 50 to 60 percent of
15 the reactor vessel head, do you recall that?

16 A. Yes, I do.

17 Q. Now, based on what you know about 96-551, can
18 this statement be true?

19 A. Based on my knowledge of that, that 100 percent
20 was not done.

21 Q. Okay.

22 MR. POOLE: I'd now like to show the witness
23 another page from the same exhibit, Exhibit 105.

24 THE COURT: Very good. It may be displayed to
25 the jury.

1 BY MR. POOLE:

2 Q. This is the table. I think you viewed it before
3 with Mr. Hibey on direct examination.

4 MR. HIBEY: No.

5 A. Not that table but I've seen that table before,
6 so --

7 Q. All right. Well, thank you for that correction.

8 So do you recognize this as the table attached to
9 serial number 2735?

10 A. Not having the serial if front of me, I'll take
11 your word for it. I -- I have seen serial -- the serial,
12 but I don't have it with me, so --

13 Q. Let me show you the whole page again.

14 A. That's fine.

15 Q. Oh, sorry. Wrong one. Here we go. Do you see
16 in the upper left-hand corner serial 2735?

17 A. Yes, sir.

18 Q. And attachment to page 2 of 2?

19 A. Yes.

20 Q. Does that help recognize it?

21 A. That's fine, yes.

22 Q. Now, on the note. It says in '96 during 10 RFO,
23 the entire RPV head was inspected. Do you see that?

24 A. Yes.

25 Q. Based on what you just said about 96-551, that's

1 a false statement, isn't it?

2 A. It depends on how you define thorough inspection.

3 I guess the question as I reviewed the statement, yes. And

4 I would disagree with that next sentence that said it was

5 void of video -- or excuse me, video was void of head

6 orientation narration. That's incorrect. You just need to

7 turn the volume up and there was volume on that tape. So

8 the entire head inspected, if I had to answer, I'd say that

9 you didn't look around every nozzle. Does that answer your

10 question, sir?

11 Q. It does. Thank you.

12 MR. POOLE: All right. Now, Exhibit 113

13 previously admitted, I'd like to display a page of that

14 one.

15 THE COURT: Of course.

16 BY MR. POOLE:

17 Q. This is from serial 2744, which contains

18 essentially a series of pictures, screen captures from

19 videos. Have you reviewed that submission?

20 A. My version of this serial was actually a black

21 and white version. I didn't have benefit of the color.

22 But, yes, I have seen this serial.

23 Q. All right. I've enlarged seven captions and I

24 want to read to you part of it. It talks about leaking

25 flanges and makes the representation because of its

1 location on the head, it could not be removed, speaking of
2 the boric acid by mechanical cleaning, but was verified not
3 to be active or wet and, therefore, did not pose a threat
4 to the head from a corrosion standpoint. Do you know
5 whether that was a true statement?

6 A. The statement about not being removed by
7 mechanical cleaning is correct. I had no basis for
8 affirming or disagreeing with the active or wet and not a
9 threat to the head from corrosion. I have no basis for
10 that.

11 Q. All right. I don't think we need to go on. But
12 the point here is that it simply wasn't part of your tasks
13 to determine whether the bulletin responses were accurate
14 or inaccurate?

15 A. That's correct.

16 Q. Now, in describing the analysis you did, you said
17 you started with the end state or the corrosion hole, the
18 conditions that existed on the head at the time the
19 corrosion hole was discovered. And you constructed models,
20 essentially mathematical models of several things, stress
21 states, cracked growth rates, flow through, and I believe
22 corrosion environment in order to model the different
23 things that were going on. Is that a fair statement?

24 A. That's correct, yes.

25 Q. And then you use that model to back in, I think

1 those are your words, to the time line that you believe
2 describes what happened to Davis-Besse?

3 A. Correct.

4 Q. And in describing how you arrived at your
5 conclusions with Mr. Hibey, you got all the way to the end
6 of your conclusions before you even discussed the operating
7 conditions at the plant, didn't you?

8 A. That's correct.

9 Q. And when you did discuss the operating conditions
10 at the plant, such as flange leakage and radiation
11 monitors, containment air coolers and the like, you did so
12 for the purpose of explaining why they don't contradict the
13 findings that you backed into using mathematical models?

14 A. That's correct.

15 Q. Now, in fact, do you recall being involved in a
16 telephone conversation with NRC staff on March 22nd, 2007
17 regarding the report that you did for First Energy?

18 A. I participated in two telephone calls. I don't
19 recall the exact dates, but I'll take your word for the
20 fact that it was that date.

21 Q. So you had a telephone conversation with NRC
22 staff where you described the analysis. Well, you --
23 Exponent representatives with you on the phone call
24 described the analysis you've done and the conclusions that
25 you reached about the time line?

1 A. That's correct.

2 Q. Is that true of both calls or have I narrowed it
3 down to one of the two?

4 A. My recollection of calls is that they both
5 discussed the time line of our report, and whether or not
6 current inspection criteria for operating nuclear reactors
7 would be sufficient to prevent an event of the Davis-Besse
8 type from occurring again. I don't recall which of the two
9 calls encompassed both of those, but that's my recollection
10 of the two calls sort of in combination.

11 Q. All right. Now, at the end of one of the calls,
12 do you recall being asked by one of the -- do you recall
13 Exponent representatives being asked by somebody on the NRC
14 side of the call whether Exponent had considered the
15 containment air cleaners and the large amount of boric acid
16 deposits that were found on the head in 2000?

17 A. I don't recall that specific comment, but it may
18 have been made.

19 Q. All right.

20 MR. POOLE: At this time, I'd like to display for
21 the jury a page from Exhibit 12 previously admitted.

22 THE COURT: Very good.

23 BY MR. POOLE:

24 Q. Is that photograph familiar to you?

25 A. Yes.

1 Q. Sometimes referred to as the red photograph?

2 A. Yes.

3 Q. And do people at Exponent call it that also?

4 A. No, we don't. It's just a photograph. I'm
5 sorry.

6 Q. And it depicts the condition of the outside of
7 the reactor vessel head in 2000, doesn't it?

8 A. Yes.

9 Q. Red boric acid flowing out from the weep holes?

10 A. Yes.

11 Q. So back to the telephone call. Do you recall
12 being asked about the containment air cleaners and the
13 large amount of boric acid and rust deposits on the head in
14 2000?

15 A. I did not recall being specifically asked about
16 the containment air cleaners. I do recall a conversation
17 about the rust deposits.

18 Q. And do you recall an Exponent representative
19 making a response, well, we weren't asked to look at that?

20 A. I don't recall that, no.

21 Q. All right. Now, in your career, have you ever
22 been the kind of engineer who goes into a reactor
23 containment building during a routine outage to do a flange
24 inspection?

25 A. No, sir.

1 Q. Have you ever actually done a flange inspection
2 in person, I mean, not reviewing videotapes but climbing
3 around on a reactor vessel head?

4 A. No, sir.

5 Q. Have you ever talked to the Davis-Besse employee,
6 Ed Chimahusky, who did the inspections -- relevant
7 inspections in this case?

8 A. No.

9 Q. Now, this jury has heard testimony that he was
10 responsible for the inspections at Davis-Besse from 1990 up
11 through 1999 and was present at the beginning of the 2000
12 inspection. Did you know that?

13 A. I have no knowledge of that, no.

14 Q. And were you informed that based on his personal
15 inspection at the time of those outages, that there was no
16 leakage from D-10 in 1998, 1999 and 2000?

17 A. No, I was not informed of that.

18 Q. And -- well, let me ask you this question: If
19 doing something like a flange inspection, I think you would
20 agree with me that having experience doing flange
21 inspections, personal experience, is relevant to the
22 quality of the results you can achieve.

23 A. I don't understand your question.

24 Q. Well, let me rephrase it. What do you think is
25 more useful in doing a good job at flange inspection, a

1 decade of personal experience, hands-on experience or a
2 Ph.D.?

3 A. I think a detailed flange inspection can be
4 completed by someone who's willing to put in the time and
5 effort to do so. In my case, I have reviewed over
6 200 hours of the video to take a look at the flanges. I've
7 listened to the audio. I've spent the time to take a look
8 at, without a prejudice of what each category of leakage
9 would look like, without that prejudice and say what do I
10 see. And my inspection of the videos, not inside
11 containment, not talking to individuals who may or may not
12 have been there at the time. My inspection of the videos
13 is the results that I presented in our report and in my
14 testimony today.

15 Q. I did not mean to suggest that your review of the
16 videos was haphazardous.

17 A. Thank you.

18 Q. But in your testimony, you did say that the
19 material -- the boric acid found on top of the insulation
20 under nozzle -- on top of the insulation above -- or around
21 nozzle 3, you said that was clearly from flange leakage and
22 not from a nozzle leak from below, is that your testimony?

23 A. I'm sorry, which outage are we talking, which
24 inspection?

25 Q. 2000.

1 A. Okay. In 2000, if you take a look at the flange
2 inspection video, there is evidence of both flange leakage
3 from above. And since in 1999 we have the crack reaching
4 above the J-Groove weld for over a year, there's a small
5 amount of leakage at the annulus at nozzle 3. There is
6 evidence underneath nozzle 3 of white deposits. Those
7 white deposits may have occurred from nozzle 31 shooting
8 laterally or may have occurred from combination of nozzle
9 31 and deposits from the annulus at the time of leakage.
10 So my -- my observations are that it is a conclusion I have
11 if it's from underneath or nozzle 3 or both.

12 Q. Thanks for that clarification.

13 A. Yes.

14 Q. You gave some testimony about unidentified
15 leakage, and I'm going to find Defendant's Exhibit 24 and
16 ask you some questions.

17 A. Okay.

18 Q. All right. Do you recognize that as the
19 unidentified leakage chart?

20 A. Yes.

21 Q. Now, I recall that you testified that when --
22 after the March 1998 outage leak and began to rise before
23 the ruptured disc was ruptured?

24 A. Correct.

25 Q. And in November through March of -- November of

1 '98 to March of '99, it spiked?

2 A. Yes.

3 Q. And your testimony was that was because of the
4 rupture and then subsequent repair of the ruptured disc?

5 A. A majority of that leakage would have been from
6 that, yes.

7 Q. And your conclusion was that the remainder, which
8 I think you said hovered around the .2 gallons per minute
9 rate, was from flange leakage?

10 A. Yes.

11 Q. Now, if this jury credits the testimony of the
12 man who performed the flange inspections that there was not
13 flange leakage during those years, and credits the
14 testimony that a cavity began to form in '98. That leakage
15 is also consistent with the development of a cavity on the
16 reactor vessel head, is it not?

17 A. Our analysis suggests that that's not possible
18 because the crack has not a large enough leak rate for the
19 cavity to form.

20 Q. And that's the analysis based on metallurgical
21 research, mathematical modeling, and backing into a time
22 line rather than basing it on operating conditions at the
23 plant, fair statement?

24 A. And a physical operation of plant data, for
25 example, in the 1998 time frame if the flange at nozzle

1 3 -- or excuse me. If the nozzle at flange 31 was leaking,
2 there would have been deposits underneath that flange
3 during the video inspection. My review of the video from
4 the 1998 11 RFO outage shows the bottom of nozzle 3 to be
5 completely clean. Thus, that supports --

6 Q. When you --

7 A. -- the no leakage in the cycle 11 time frame from
8 '96 to '98, now from --

9 Q. Let me understand '98.

10 MR. HIBEY: Excuse me, Your Honor, he's not
11 completed his answer.

12 THE COURT: I understand. Let him finish. I'm
13 sorry. Were you through, sir?

14 A. I'm fine. It's fine.

15 Q. I will give you an opportunity to go back into
16 that but I wanted to ask about '98. You said, I believe,
17 that you examined the area at the base of the nozzle in
18 1998 and found it free of boric acid?

19 A. No. The area underneath the nozzle flange,
20 underneath the bottom of the flange, which is what the
21 first camera is trying to inspect for. You can just bring
22 the nozzle.

23 Q. You're talking about the area on top of
24 insulation?

25 A. Above the insulation under the flange. If you'll

1 just bring me the nozzle, I'll show you. Yeah, that's
2 exactly right.

3 Q. We'll show the jury.

4 A. The region nozzle 3 was completely clean
5 underneath the nozzle, and in this area right here
6 circumferentially around, so there were no deposits.

7 Q. So you're testifying that because there were no
8 deposits on the bottom of this flange, that it's impossible
9 for there to be leakage below insulation?

10 A. There's some corollary information that would
11 support that claim. We looked at a supplemental video
12 taken at 13 RFO under nozzle 2, which had a very small
13 wastage cavity identified after the nozzle was removed.
14 That small wastage cavity was about the same size as the
15 small cavity that we predicted to be prevalent in mid 2001.
16 Underneath the flange of nozzle 2 at 13 RFO, there were
17 deposits. So even a small leakage from nozzle 2 at 13 RFO
18 provided deposits underneath the flange, and we saw none in
19 1998 at 11 RFO from which we concluded that there was no
20 leakage of a level equal to or greater than that which was
21 found in nozzle 2 at 13 RFO.

22 Q. Nozzle two's next to nozzle 3, isn't it?

23 A. Correct.

24 Q. And presumably, if nozzle 3 is spewing boric
25 acid, that could result in boric acid appearing under the

1 flanges above insulation, not just nozzle 3?

2 A. No, because there were no other nozzles that were
3 identified besides nozzle 2 at 13 RFO. All the peripheral
4 nozzle around 3, none of which had similar deposits. So we
5 concluded that deposit came from the crack in nozzle 2 at
6 13 RFO and not from deposits from spewing from nozzle 3.
7 Besides which to spew from nozzle 3 and get it to nozzle 2
8 would be a pretty tough geometric challenge.

9 Q. Let me ask you this: You're aware, aren't you,
10 that boric acid was left on the top of the reactor vessel
11 head in 1996?

12 A. Yes.

13 Q. And in 1998?

14 A. Yes.

15 Q. And in 2000?

16 A. Yes.

17 Q. And that it's been described as a substantial
18 build-up?

19 A. When was it described as a substantial build-up?

20 Q. A consultant on a review of the year 2000
21 inspection tapes characterized it as a substantial build-up
22 at the conclusion of the 12th refueling outage.

23 A. I would agree completely because nozzle 31 was
24 leaking.

25 Q. And so that hardened crusty barrier, that could

1 be a barrier to boron squirting up from the nozzle and
2 reaching the bottom of the flange, could it not?

3 A. It would be difficult at the velocities of
4 ejection that we calculated. It's pretty hard to stop
5 something that's going that quick.

6 Q. All right. But if the calculations don't reflect
7 the reality of the processes that were occurring, then it
8 could, couldn't it?

9 A. The calculations were based on fundamental
10 thermodynamics. I have no reason to disagree with that.

11 Q. All right. Now, you made some assumptions in
12 your report; isn't that true?

13 A. Yes.

14 Q. And one of the assumptions that you made was
15 about the J-Groove weld material, do you recall that?

16 A. Excuse me, the material or the properties in the
17 material?

18 Q. The properties in the material that the J-Groove
19 weld was made up of.

20 A. We used the specifications from the plant that
21 said the J-Groove weld consisted of alloy 182, which is
22 standard welding material for material welded to alloy 600.

23 Q. Yes, and you assumed that the properties of 182
24 were identical to alloy 600?

25 A. We -- they're very similar alloys, yes.

1 Q. Are they the same?

2 A. No, there are minor alloy and changes so that the
3 weld doesn't crack when you weld it to alloy 600, it's not
4 a homogenous weld -- sorry, it's not a weld made of the
5 same material that you're welding to.

6 Q. And did you, in fact, have information, specific
7 information, about the properties of that material?

8 A. Of alloy 182?

9 Q. Yes.

10 A. We used the data that were derived from the
11 materials MRP, materials -- I forgot what MRP stood for.

12 Q. Materials reliability?

13 A. And also the HIPPA data. So we used two sets of
14 data.

15 Q. But those are data for inconel alloy 600, are
16 they not, not for material 182?

17 A. To be honest, I don't recall because I did not do
18 the fracture analysis evaluation that was done by Dr. Bob
19 sire, S-I-R-E.

20 Q. And you stated -- let me get back to something.
21 A minute ago, counsel pointed out that I cut you off in the
22 middle of an answer. I don't remember where I was, but if
23 you do, you're welcome to finish your answer now.

24 A. I'm fine, thank you.

25 Q. Okay. Let's get back to the assumptions.

1 Another one that you mentioned here in court was the number
2 of weld passes?

3 A. Yes.

4 Q. And those were the welds that were used to fasten
5 the nozzle to the bottom of the reactor vessel head; is
6 that correct?

7 A. Correct.

8 Q. And your calculations assumed that there were 13
9 passes building up that material; is that correct?

10 A. Yes.

11 Q. Now, the number of passes that were made during
12 the weld affects the stresses on the metal, correct?

13 A. To a certain extent, yes.

14 Q. Is it fair to say that more passes equates to
15 more stress?

16 A. No.

17 Q. But it is the case that the number of passes
18 affects the stress level of the nozzle?

19 A. Yes.

20 Q. And you use the number 13 because it seemed a
21 reasonable assumption in the absence of the actual
22 information?

23 A. In the absence of the actual information, yes,
24 but it also was a reasonable assumption in that if you look
25 at the calculations that are done, as you lay down the weld

1 pass, the next time you go around the metal that's been
2 solidified, you heat it up again. As you heat up it up
3 again, you relieve the stress so the stress state changes
4 with every weld pass. It comes to a point where you reach
5 diminishing returns, that next weld pass doesn't make much
6 change in the residual stress that remains. So after
7 you've made more than 2 but less than 13, you have reached
8 a point where the next weld pass may change properties on
9 the order of maybe 5 to 10 percent. But those types of
10 levels don't make a difference in the subsequent
11 calculations that we undertook.

12 Q. Did your -- did your calculations take account of
13 efforts that were made in manufacturing the vessel head to
14 straighten the nozzles after they were inserted in the
15 head?

16 A. We did not.

17 Q. And that would affect the stress level, would it
18 not?

19 A. Not necessarily. We did not feel it necessary
20 because efforts to straighten the nozzle would result in
21 yielding of the material. Yielding of the material sets
22 the maximum stress state that you can have, and so we felt
23 that our results encompassed the maximum stress state, so
24 it was not necessary to take into consideration
25 straightening or grinding or any other mechanical endeavor

1 used to straighten the material. We did, however, take
2 into account the hydro testing and the operating pressures
3 during a lifetime reactor.

4 Q. Okay. Among the assumptions that -- that you
5 used -- well, let's show the jury Defendant's Exhibit 22-G.
6 That shows the condition of the -- of the nozzle by your
7 calculation at the time of the 12th refueling outage?

8 A. Yes, the location of the crack, correct.

9 Q. Correct me if I'm wrong, I believe your testimony
10 was that there might have been slight leakage at that time
11 but not much.

12 A. That's correct.

13 Q. And your testimony further was that corrosion is
14 inconsistent with low rates of leakage?

15 A. Corrosion within the annulus.

16 Q. Within the annulus?

17 A. Yes.

18 Q. What about on the head of the reactor vessel?

19 A. The temperature on the head would also preclude
20 corrosion, the reason that it's precluded in the --

21 THE COURT REPORTER: Can you please state that
22 again?

23 A. The reason it's precluded in the annulus is
24 because the temperature is greater than 450 degrees
25 Fahrenheit. The temperature on the head is also greater

1 than 450 degrees Fahrenheit. The reason that boric acid
2 was allowed to be left on the head was an assumption that
3 at the high temperatures of operation in the absence of
4 water, there would be no damage.

5 Q. Are you aware of corrosion incident at Oconee
6 Nuclear Power Station, one of the vessels there involving
7 corrosion found on the reactor vessel head at a very low
8 rate of leakage?

9 A. Yes.

10 Q. And isn't that inconsistent with the opinion
11 you've just given us?

12 A. No, because that was for a different type of
13 crack. That was for an axial crack that went all the way
14 around, and the wastage associated with that crack was,
15 again, associated with thermal conditions that would have
16 been conducive to material removal.

17 Q. So you just said it was an axial crack that went
18 all the way?

19 A. No, I'm sorry, it's circumferential cracking. I
20 misspoke. The --

21 Q. Are you familiar with the information about
22 cracking problems found in the heat or batch that nozzle 3
23 was made of?

24 A. Yes.

25 Q. And are you aware that there are, in power plants

1 around the United States, quite a number of work -- or were
2 quite a number of nozzles made out of that particular heat
3 of inconel and alloy 600?

4 A. Yes.

5 Q. And in fact, at Oconee -- and Oconee reactor
6 vessel head, 68 out of 69 nozzles were from that heat?

7 A. Yes.

8 Q. Fifteen of those cracked?

9 A. Yes.

10 Q. At Davis-Besse, they had five nozzles from that
11 heat?

12 A. Yes.

13 Q. Four of those cracked?

14 A. Yes.

15 Q. And your comment -- your comment that you made
16 about the cracked growth rate that you applied in your
17 model is that Davis-Besse was within the normal
18 distribution that you would expect of, I guess, nozzles
19 from that heat?

20 A. It was in the distribution of all data for all
21 cracks of alloy 600 that had ever been tested.

22 Q. Okay.

23 A. Not specific to nozzle and reactors.

24 Q. All right. Well, let's get back to the nozzles
25 from that heat.

1 So there were lots of cracked nozzles from that
2 heat?

3 A. Yes.

4 Q. Fair statement. And how many of those nozzles
5 grew to create large corrosion holes?

6 A. Nozzle 3 at Davis-Besse was the only crack that
7 promulgated to a distance of greater than an inch, and so
8 only one nozzle created a large hole. Other small wastage
9 was noted at nozzles 2 and 3, excuse me, 1 and 2 at
10 Davis-Besse. And there was the wastage event that you
11 noted for the upcoming -- the small amount of wastage.

12 Q. So your testimony is that due to the processes
13 you modeled, you're certain that the -- that the wastage --
14 significant wastage in the corrosion hole began to develop
15 in about October of 2001?

16 A. The significant wastage, yes.

17 Q. But despite all the cracking and all the other
18 nozzles from that same heat, no other large corrosion holes
19 were found?

20 A. That's true, which makes this event unique.

21 Q. And which is helpful for the insurance claim,
22 isn't it?

23 A. It's a fact.

24 Q. Isn't it also -- wouldn't it also be consistent
25 with -- with the large corrosion hole, setting aside the

1 model, that the crack that developed that could have simply
2 started earlier and the cavity had begun to form earlier,
3 and that explains why the corrosion hole happened here but
4 didn't happen at other plants?

5 A. No.

6 Q. So those -- I mean, is the nozzle at Davis-Besse
7 metallurgically unique?

8 A. No, it's the same metal.

9 Q. Is there any evidence that the stresses that were
10 on it were unique and not replicated in any other nozzle?

11 A. There are no mentions of the stress.

12 Q. Now, let's -- let's talk about the consequences
13 of your model and your conclusions. You said that
14 significant wastage began in October of 2001?

15 A. Correct.

16 Q. So if the plant had shut down and inspected in
17 October of 2001, there would have been a wastage hole there
18 to find?

19 A. Most likely.

20 Q. Certainly non destructive testing would have
21 found it?

22 A. Non destructive testing would have found the
23 cracks in the nozzle. Non destructive testing, even when
24 they did it, did not identify the wastage cavity.

25 Q. All right. But your opinion was that there was a

1 wastage cavity there in approximately the October, 2000
2 time period?

3 A. October 2000?

4 Q. Of 2001 I meant to say.

5 A. Yes, October 2001.

6 Q. All right. Now, are you aware that there have
7 been a series of discussions between the Nuclear Regulatory
8 Commission and the First Energy Company about the report
9 that Exponent did for First Energy?

10 A. Yes, I am.

11 Q. And are you aware that there was -- when the
12 Nuclear Regulatory Commission found out about the report,
13 that there was a request for information about it?

14 A. Yes.

15 Q. And FENOC responded?

16 A. Yes.

17 Q. And then --

18 MR. HIBEY: Excuse me, Your Honor. May we
19 approach the bench?

20 (A side bar conference was had on the
21 record.)

22 THE COURT: Mr. Hibey?

23 MR. HIBEY: Your Honor, I think that Mr. Poole is
24 really getting into questions involving FENOC's response.

25 THE COURT: Which would be hearsay.

1 MR. HIBEY: That's right, yes.

2 THE COURT: As to this witness, why would they
3 not be rank hearsay?

4 MR. POOLE: May I confer with my co-counsel? All
5 right. Judge, I've got a theory for you. FENOC has
6 repudiated in its report and we offer the evidence that the
7 client with a \$200,000,000 claim at stake has stepped back
8 from it, and we offer that as impeachment, not for the
9 truth of the matter, but to impeach the claims he made on
10 the stand.

11 THE COURT: Unless that's agreed to by defendant,
12 it's got to be done through somebody from FENOC who is
13 knowledgeable about it. It can't be done through this
14 witness as to whom -- unless he was a party to -- even if
15 he was a party to the decision would be rank hearsay. How
16 can that not be hearsay? He's reporting what FENOC did,
17 and that would be hearsay.

18 MR. STICKAN: Your Honor, may I weigh in on this
19 a little bit? I'm on the periphery here.

20 Judge, their witness has testified at length
21 about what other people have told him and, of course, in
22 his direct testimony with Mr. Hibey, which is hearsay. But
23 he's an expert, and he's been allowed to do that to form
24 his opinion. I think that we're allowed to cross examine
25 him on how that opinion was formed, and this would

1 certainly be relevant to form an opinion if you find out
2 your client has repudiated your own report.

3 THE COURT: But that's after the opinion was done
4 and reduced to a report. The rejection of the report, as I
5 understand it from total hearsay, according to the Toledo
6 Blade, was after it was filed when it came to light here
7 and it was filed late with the NRC, and the NRC asked FENOC
8 to explain. That's about when they came back, drew away
9 from that report. That's hearsay as to the content and
10 underpinnings of the report. And if you want to bring them
11 in on a rebuttal, an officer or knowledgeable person from
12 FENOC, that's fair game to rebut his testimony.

13 MR. HIBEY: We would want to be heard on that.

14 THE COURT: No, you wouldn't want to be heard
15 because you wouldn't want my ruling.

16 MR. BALLANTINE: It seems to me a relevant
17 question for cross examination that this witness has your
18 client accepted this report, adopted this report. And the
19 answer is no, then the question would be why not.

20 MR. HIBEY: What's the relevance of that to this
21 preceding?

22 MR. BALLANTINE: Because the client knows the
23 basis for the report.

24 THE COURT: What client?

25 MR. BALLANTINE: The client is FENOC.

1 MR. HIBEY: But that has got nothing to do with
2 the, quote, client or FENOC.

3 MR. BALLANTINE: But you've put him on to present
4 his testimony.

5 MR. HIBEY: Simply to put on his testimony, not
6 to come in here and say I'm a FENOC witness.

7 MR. BALLANTINE: We get to cross examine.

8 THE COURT: Woah, woah. She can't keep up with
9 you two idiots. He can't testify on that. He could
10 testify, how much did you charge FENOC for this report and
11 have him pay, but other than that, as to FENOC's decision
12 whether or not to back off from the report after it was in
13 the hands of the NRC, that's hearsay.

14 MR. POOLE: We accept The Court's ruling.

15 THE COURT: And Mr. Hibey --

16 MR. HIBEY: Yes, sir.

17 THE COURT: We'll talk about right now their
18 right to call a rebuttal witness if the report was, in
19 fact, rejected for reasons other than political reasons.

20 MR. HIBEY: Well, you'll be getting -- yes,
21 that's an enormous thicket that we're walking into. We'll
22 take it one step at a time. I just wanted to say that this
23 characterization of repudiation is nothing I would
24 associate with -- notwithstanding the Toledo Blade.

25 Number two, all I said was if they try to bring

1 somebody in from FENOC on this subject, we'd want to be
2 heard.

3 THE COURT: I understand. I understand. But I'm
4 getting ahead of the game.

5 MR. HIBEY: Exactly.

6 THE COURT: But that seems to me that the only
7 reason for bringing them in is if FENOC rejected the
8 underpinnings of the science, not the political aspects and
9 their dealings with NRC. That's not before this court.

10 (Side bar concluded.)

11 BY MR. POOLE:

12 Q. Just a couple more questions, Dr. Bullen.

13 I think you said that that report was prepared in
14 part at least in support of an insurance claim by First
15 Energy Nuclear Operating Company.

16 A. That's correct.

17 Q. And is it customary for Exponent to charge for
18 its services?

19 A. Yes.

20 Q. Did it do so in this case?

21 A. Yes.

22 Q. How much?

23 A. We spent about 6,000 manhours developing a
24 661-page report at a cost of about one-and-a-half million
25 dollars.

1 Q. Thank you. That's all the questions we have.

2 MR. HIBEY: Indulge me one moment.

3 THE COURT: Yes, of course.

4 REDIRECT EXAMINATION

5 BY MR. HIBEY:

6 Q. Dr. Bullen, did -- when you went into this
7 engagement to do this study, which Mr. Poole has asked you
8 about, did Exponent go into it with a preconceived notion
9 that it would make the findings that it found?

10 A. We did not. In our initial meetings with both
11 the external counsel, Morgan Lewis and Bockius and also the
12 counsel for the staff counsel for First Energy, we made it
13 abundantly clear that we would do the analysis that we
14 foresaw, which was the modeling effort and a determination
15 of the evolution of the wastage cavity, and the results
16 would be the results. They may not like what they found,
17 at which point I would assume that they would decide not to
18 pursue the case. So our report was written based on the
19 facts in evidence that we had and our modeling effort that
20 we developed. And those results are the results that we
21 would have -- those are the results, period.

22 MR. HIBEY: No further questions.

23 THE COURT: Ladies and gentlemen, we'll now take
24 our afternoon break for 15 minutes. We'll be back at 3:30.
25 Please remember my previous admonitions to you not to

1 discuss this case among yourselves or with anyone else, nor
2 permit anyone else to discuss it with you, and do not make
3 up your minds on the ultimate issues we will decide at the
4 end of the case. Enjoy your break.

5 The witness is excused.

6 (A brief recess was taken.)

7 THE COURT: Mr. Wise, what do you have new which
8 would change The Court's mind with respect to your motion
9 to admit rejection of the government's offer of deferred
10 prosecution?

11 MR. WISE: I think there are three things, Judge.
12 One is -- is that the government has, with multiple
13 witnesses, elicited the fact that those witnesses were, at
14 one point, told they were targets and later told they were
15 subjects. This coming after we indicated that we were not
16 going to go into that on cross so that there was no
17 legitimate reason to pull the string of that information,
18 so this jury has heard information about prosecutorial
19 exercises of discretion with regard to people they've heard
20 from.

21 And one of the points that I believe The Court
22 mentioned and that the government has stressed in their
23 opposition was the idea that a jury might misuse the
24 evidence of Mr. Geisen's rejection of his deferred
25 prosecution agreement offer as evidence of what the

1 prosecutors were thinking. The government's now put what
2 they've been thinking about other witnesses squarely in
3 front of the jury, knowing full well that --

4 THE COURT: Mr. Wise, that is done every time for
5 the purpose of disclosing it to the jury so that they can
6 judge whether the testimony is in exchange for the offer
7 and acceptance by the government and the witness, not for
8 the purpose of a denial of guilt.

9 MR. WISE: Your Honor, it's done all the time
10 when witnesses are offered a plea or testifying under
11 immunity. I don't, in my experience, and obviously I'm
12 not -- I'll defer to The Court on what The Court's
13 experience is, but to elicit from a witness that they were,
14 at one point, a subject and then a witness or at one point
15 a target and then a subject, when the defense has said we
16 are not going to bring up that witness' status, this jury
17 had no idea that Steve Moffitt was at one point a target of
18 the investigation and later became a subject and wouldn't
19 have found that out.

20 THE COURT: I'll let -- I'll let the government
21 respond. Go ahead. Continue.

22 MR. WISE: The second thing is that The Court has
23 heard, I think along with the jury, virtually no evidence
24 of actual knowledge. And I think this morning in dealing
25 with the MJOA issue The Court indicated that this was

1 really an issue of circumstantial evidence.

2 When the case on a charge like false statements
3 revolves around circumstantial evidence, the defendant's
4 state of mind becomes critical. And what the Second
5 Circuit realized in the case that we gave to Your Honor
6 dealing with the rejection of the immunity is that in a
7 situation like that, this is the type of evidence that a
8 jury should be allowed to hear on the grounds that an
9 average juror would think, I would jump at that if I were
10 given the offer because it is so relevant to the
11 defendant's state of mind.

12 The third thing -- and this is not new, it's just
13 something that we had not proposed and that I think
14 remunerates The Court's concern and that I would have no
15 objection if The Court, after the testimony about the
16 rejection of the deferred prosecution agreement came out,
17 were to instruct the jury that they were only to use that
18 evidence as evidence of the defendant's state of mind and
19 not for any other purpose.

20 And I think those things allow this relevant
21 evidence to get before this jury in this case where it is
22 particularly relevant. And the surrounding circumstances
23 of what happened has happened in this trial make the
24 prejudice of it or the potential for confusion minimal at
25 most. Thank you.

1 THE COURT: Mr. Ballantine?

2 MR. BALLANTINE: Your Honor, with respect to the
3 issue of taking the sting out of the issue of a witness
4 having been a target or subject or having met with the
5 government under guarantee for a day letter, we never got a
6 blanket statement from the defense that they were not going
7 to use that kind of evidence with respect to our witnesses.
8 When it came up at side bar, we then stopped. And in fact,
9 with respect to Mr. Chimahusky went and asked ahead of time
10 whether they wish to go into that with respect to him and
11 they said no, and I didn't bring it up with reference to
12 Chimahusky. If that had been in the cards and if they want
13 to make some sort of blanket representation to us that they
14 weren't going to cross examine their witnesses about their
15 prior status with respect to the government, that would be
16 one thing, but that's not the case here. I don't see that
17 as new information that affects the information of the
18 relevancy of the deferred prosecution agreement.

19 The issues that were before The Court before that
20 make this tangled are still here, which is in order to get
21 into what this might or might not mean about a particular
22 defendant's state of mind, we need to get into what he
23 thought the offer meant because it's not, you know -- it's
24 not a -- a bargain that you would jump for. If it meant
25 you would be tossed from the industry forever and if you

1 thought that your -- the outcome after trial would be the
2 same, better, worse. We'd have to get into all that, get
3 down into the weaves of all of that in order for us to
4 address what we consider to be the irrelevancy of this
5 case. We considered deferred prosecution not to be a
6 relevant evidence.

7 The instruction that Mr. Wise proposed would
8 merely emphasize that the evidence -- I don't see how
9 that's a benefit to the government in discussions.
10 Essentially, I don't think there's anything new here and we
11 hadn't expected to argue this at this time, but if there
12 are questions The Court has, we'd be happy to try to answer
13 them.

14 THE COURT: I had said at our pretrial conference
15 that with respect to that motion, I had tentatively reached
16 the conclusion to deny it. At that time, I indicated that
17 it is my opinion there were far too many factors and
18 variables, why did he reject through some witnesses. We
19 have heard that part of the issue was their continuing
20 viability to be employed within the nuclear industry. And
21 if there were a finding of guilt, that would bargain for
22 life. I believe one witness said or at least that's my
23 understanding through discussion. Whatever it may be, it
24 would seem to me that there are more reasons to keep it out
25 than to permit it to come in. And those reasons are that

1 we then open the door to cross examination on what he was
2 told by his counsel; and therefore, what he understood a
3 deferred prosecution agreement to mean for him, and what
4 else was involved in his consideration, including his
5 position for future employment in the nuclear industry and
6 other employment. It also would get into his perception
7 and maybe the discussion with counsel about, well, I -- I
8 rejected it because I felt that the government's case was
9 weak, and therefore, I felt it was worth the risk.

10 There are too many variables like probability or
11 possibility of winning, the length or type of sentence he
12 was facing against the possibility or probability of
13 winning through a not guilty verdict. There are just too
14 many variables other than the explanation which would be
15 permitted to the defendants on closing argument that that
16 represented his denial of guilt. I will not permit it and
17 I will deny the motion. Ready?

18 MR. WISE: I guess I'm not sure where we left
19 things on the schedule. Does The Court want us to call
20 Mr. Geisen to the stand now?

21 THE COURT: I think we can get through an hour
22 and a quarter at least. Will that be an appropriate
23 breaking --

24 MR. WISE: We're ready to, Your Honor.

25 THE COURT: Mr. Wise, please approach.

1 (A side bar conference was had off the
2 record.)

3 THE COURT: Please call your next witness, Mr.
4 Wise.

5 MR. WISE: Thank you, Your Honor. Defense calls
6 David Geisen.

7 DAVID GEISEN,
8 was herein, called as if upon examination, was first duly
9 sworn, as hereinafter certified, and said as follows:

10 DIRECT EXAMINATION

11 BY MR. WISE:

12 Q. Mr. Geisen, good afternoon.

13 A. Good afternoon.

14 Q. Could you introduce yourself to the jury please
15 and spell your last name for the court reporter?

16 A. My name is David Geisen, G-E-I-S-E-N.

17 Q. Mr. Geisen, in the fall of 2001 did you work at
18 Davis-Besse?

19 A. Yes, I did.

20 Q. What was your job?

21 A. I was the design basis engineering manager.

22 Q. Did you participate in communications with the
23 NRC regarding Davis-Besse's responses to bulletin 2001-01?

24 A. Yes, I did.

25 Q. Did you ever submit written documents to the NRC

1 that you knew to be false?

2 A. No, I did not.

3 Q. Did you make any oral statements to the NRC that
4 you knew to be false?

5 A. No, I did not.

6 Q. Did you participate in a scheme to deceive the
7 Nuclear Regulatory Commission?

8 A. Absolutely not.

9 Q. Did you withhold information regarding the safety
10 of Davis-Besse from the NRC?

11 A. No, I did not.

12 Q. Let me ask you to tell the jury a little bit
13 about yourself, starting with how old you are.

14 A. I am 47 years old.

15 Q. Where do you live?

16 A. I live in De Pere, Wisconsin. It's just outside
17 Green Bay.

18 Q. How long have you lived there?

19 A. Just over three years.

20 Q. And before you moved to Wisconsin, where did you
21 live?

22 A. I lived in Perrysburg, Ohio.

23 Q. Are you married?

24 A. Yes, I am, wife's in the back row.

25 Q. What's her name?

1 A. Kathleen.

2 Q. Do you have any kids?

3 A. Yes, we do.

4 Q. How many?

5 A. We have three kids; a daughter who's off, 24
6 years old, lives in D.C.

7 Q. What's her name?

8 A. Ashley. She works for the National Law
9 Enforcement Museum. I've got a son who's 19, Nicholas,
10 who's at Drake University right now his sophomore year
11 pre-med. And I've got a daughter, Meg, who's at the
12 University of Minnesota at Megan, who is a freshman music
13 major.

14 Q. What year did you and Kathy get married?

15 A. We got married shortly after graduation from
16 college in 1982.

17 Q. Where did you graduate from college?

18 A. Marquette University.

19 Q. And after you graduated from college, what did
20 you do next?

21 A. I was ROTC at Marquette, so my junior year, I did
22 recover -- got selected for and went off into the Navy in
23 nuclear submarines.

24 Q. I'm going to have to ask you to slow down just a
25 little bit so that Ms. Nixon can take everything down. I

1 apologize.

2 How many years were you in the Navy?

3 A. Six years.

4 Q. And did you do any tours on submarines?

5 A. Yes, I was on a ballistic submarine that was
6 stationed in Connecticut but refitted out the HollyRock,
7 Scotland, did five patrols on it.

8 Q. When did you leave the Navy?

9 A. I left the Navy in May of 1988.

10 Q. And what did you do after you left the Navy?

11 A. I joined Toledo Edison and the Davis-Besse
12 Nuclear Power Station.

13 Q. Is Toledo Edison now the company known as First
14 Energy?

15 A. Yeah, they've gone through a couple of changes
16 but First Energy now.

17 Q. What year did you join First Energy?

18 A. 1988.

19 Q. And can you tell the jury a little bit about the
20 jobs you held between 1988 and 1996.

21 A. Yes, in 1988 I joined as -- in their systems
22 engineering group. I was actually in the mechanical
23 systems group at various mechanical systems assigned to me,
24 primarily pumps. And then I did that all the way until
25 1994. I was selected for the senior -- senior reactor

1 operator licensing program. That was --

2 Q. From 1988 to 1994 when you were in systems
3 engineering, were you ever involved with the reactor vessel
4 head?

5 A. No.

6 Q. 1994, you said you entered the scene, or reactor
7 operator training program?

8 A. That's correct.

9 Q. And tell me a little bit about what that program
10 was.

11 A. That's a program that's designed to teach you
12 everything about all the different systems at the plant,
13 learn about the -- how the plant actually functions,
14 operates, all aspects of it, and what the goal of actually
15 getting you licensed to operate in the control room,
16 operate the plant.

17 Q. How long were you in the SRO training program?

18 A. Until the summer of 1996.

19 Q. In 1996 when the plant was going through the 10th
20 refueling outage, did you have any involvement in that
21 outage?

22 A. No, not really. We were still in preparation for
23 our final exams with the NRC that were going to be in the
24 summer.

25 Q. So I take it you had no involvement in the head

1 cleaning efforts in 1996?

2 A. No, I didn't.

3 Q. Or in the inspection efforts in 1996?

4 A. No, I didn't.

5 Q. You've heard testimony from Prasoon Goyal about
6 his writing of a PCAQ or a condition report in 1996. Do
7 you recall that testimony?

8 A. Yes, I do.

9 Q. Did you have anything to do with that condition
10 report in 1996?

11 A. No, I didn't.

12 Q. 1997?

13 A. No.

14 Q. 1998?

15 A. No.

16 Q. When was the first time that you saw that
17 condition report, 96-551?

18 A. I believe I saw it sometime in the spring of
19 2002. I can't say exactly who had showed it to me because
20 I was involved in a lot of different interviews because we
21 had just found the cavity and we were trying to do a lot of
22 searching as to what happened. So sometime in that time
23 frame.

24 Q. Was there a time during your tenure at
25 Davis-Besse that you were on the Corrective Action Review

1 Board?

2 A. Yes. The Corrective Action Review Board is a
3 position that's filled by managers, and I didn't get
4 through my whole history at Davis-Besse, but at -- in March
5 of 2000, I became the design basis engineering manager, at
6 which point I became a member of the CARB or the Corrective
7 Action Review Board.

8 Q. That was in 2002 -- I'm sorry. That was in 2000?

9 A. March of 2000, that's correct.

10 Q. Okay. I'll try not to confuse you. Let me --

11 A. I do that myself.

12 Q. Let me take you back to 1998. At the time that
13 the plant went through 11 RFO, did you have any involvement
14 in the head cleaning during 11 RFO?

15 A. No, I didn't.

16 Q. Or in the inspection of the head at 11 RFO?

17 A. No, I didn't.

18 Q. Did you have any role in the 11th refueling
19 outage?

20 A. Yes, I did.

21 Q. What was that?

22 A. During that time frame as I had come out of the
23 senior operating program and was made a supervisor in
24 systems of the electrical and instrumentation control
25 group, but because I've had so much experience with reactor

1 coolant pump motors, there was motor work going on. I
2 believe it was actually upper bearing rework on two-two
3 motor, but I'm not positive on actually which motor it was.
4 And I got recruited to work on the motors.

5 Q. And again, that had nothing to do with the head
6 cleaning and head inspection?

7 A. No.

8 Q. When did you become the manager of design
9 engineering?

10 A. March of 2000.

11 Q. And tell the jury a little bit about what your
12 responsibilities were as the manager of design engineering.

13 A. Well, the manager of design engineering is
14 responsible for -- overall for the design of the plant,
15 whereas other engineering groups might be responsible for
16 day-to-day maintenance operation of the plant. My group
17 was -- I basically had five supervisors that work for me
18 that consisted of mechanical design, mechanical, slash,
19 civil design that was under Theo Swim. Mr. Lang was my
20 supervisor of the electric and IC design group. Dennis
21 Mominee was my supervisor of procurement engineering. They
22 are the ones that do a lot of the evaluations of our parts
23 and stuff that we buy, and establishing specifications to
24 make sure what we order is what we -- whether what we get
25 is what we ordered.

1 And then I also had a computer engineering group,
2 which is Greg Hayes, and they were responsible for the
3 mainframes of computers that operate at the plant.

4 And then the last group I had was Ted Lang, who
5 was nuclear engineering. And they were responsible
6 primarily -- they did a lot of things, but primarily a lot
7 of nuclear calculations.

8 Q. Just so the jury understands how the flowchart
9 works, you described a couple supervisors that you had.
10 Were those supervisors that were above you on the
11 organization chart or below you?

12 A. I'm sorry. They were below me. I had five
13 supervisors that reported to me, and I myself reported up
14 to Steve Moffitt, the director of technical services.

15 Q. You were here, there were five supervisors
16 underneath you?

17 A. Correct.

18 Q. How many engineers were there underneath those
19 five supervisors?

20 A. Approximately 30 to 32 engineers split up among
21 the five groups.

22 Q. When you took the job as manager of the
23 department in 2000, can you tell the jury a little bit
24 about how the department had performed over the past year
25 before you took the job?

1 A. Well, the department was -- was not performing
2 well. There was a lot of issues. Probably the biggest
3 concern within the station was there was -- there had been
4 kind of an alienation between the design group, which was
5 operating -- their offices and everything are outside the
6 fence, outside the protected area, and the rest of
7 engineering was inside the fence. And there was some real
8 serious communication issues there. Myself, coming from
9 the plant engineering group, I was hoping to bridge that a
10 little bit by putting me into the design group.

11 Design also had struggled with a lot of issues
12 with modifications, getting them issued in a timely manner.
13 I came into it right before the 12th refueling outage, and
14 it was not a good outage from the standpoint we didn't have
15 a lot of modifications ready. The packages were not ready.
16 Parts were not ordered in a timely manner. There were a
17 lot of last minute changes, a lot of what we call FPR's,
18 field problem resolutions, were being generated, so we were
19 getting a lot of scrutiny.

20 And probably within the first three, four months
21 of me being in that role, we got -- I got a lot of help in
22 terms of outside groups coming in and doing evaluations and
23 identifying a big laundry list of things we needed to fix.

24 Q. You described failures on getting modifications
25 ready. Are those modifications that were implemented

1 during the refueling outages?

2 A. They were intended to be implemented during
3 refueling outages. In this particular outage at 12 RFO, we
4 actually had to defer some of them out of there because we
5 didn't have them ready.

6 Q. And by didn't have them ready, what would make a
7 modification not ready?

8 A. The package, the design package -- it just
9 wouldn't be done. Design has a lot of work that they have
10 to do with regard to calculations, drawing up dates. I
11 mean, there's a lot of that goes into developing a
12 modification to the plant. We're called design basis
13 engineering because we maintain the design basis of the
14 plant, so you just don't change the plant willy nilly.
15 You've got to have a very thought-out process to do that.
16 And they weren't ready to go, or they were completed so
17 late that we, you know, basically put the procurement group
18 into a difficult position because they were ordering parts
19 late and the lag time of the parts --

20 Q. How many modifications, on average, did the plant
21 implement during a refueling outage?

22 A. Well, it spiked up a lot in 12 RFO, but three
23 outages before that averaged about 30 to 40. It was
24 probably for the total cycle, operating cycle and outage, a
25 little bit more comfortable with those numbers. We would

1 end up having about 68 to 70.

2 Q. And how many of those modifications would design
3 engineering be involved in?

4 A. All of them. I didn't finish what I was going to
5 say, is that it spiked up to 12 RFO because it was -- there
6 was a big obsolescence push to try to fix some of our old
7 obsolescence issues. So I think the total for 12 -- cycle
8 12 to 12 RFO and cycle 13 and 13 RFO was 175 and 168
9 respectively, so it really jumped up.

10 Q. Tell The Judge what you mean by obsolescence
11 issues.

12 A. Because we maintained the design basis of the
13 plant. We maintain that all the way down to even the
14 serial number or the model number of a valve. And there
15 would be times when you would find, okay, well, the
16 manufacturer of that is no longer available or they've
17 changed that model and you've got to do what we call
18 like-for-like valuation. But it may be the exact same
19 size, shape, valve, but it's a different model number. So
20 therefore, that's actual design change to the plant.

21 Q. Okay. Let me take you back to 12 RFO and ask you
22 if there came a time that you became involved in
23 discussions about the effort to clean the reactor vessel
24 head during 12 RFO.

25 A. Yes, I did.

1 Q. And how did it happen that you got involved in
2 those discussions?

3 A. Well, the -- it was brought to my attention. I
4 don't remember exactly who all brought it up, but there was
5 a representative or discussion going between plant
6 engineering and design engineering at the engineering
7 supervisor level, and it was kicked up to me.

8 Q. Who were the people involved in the discussion
9 from the design --

10 A. Prasoon Goyal and Theo Swim. Prasoon was --
11 worked for Theo.

12 Q. And Theo was who?

13 A. One of my supervisors.

14 Q. And by that, you mean a supervisor underneath
15 you?

16 A. Correct, reported to me.

17 Q. And who was involved in the discussion from the
18 systems side?

19 A. I know Glenn McIntyre intire was involved because
20 he -- he and Theo were at the same level and they were
21 discussing it.

22 Q. And who was it that was actually doing the
23 cleaning of the head?

24 A. That was Andrew Siemaszko.

25 Q. Tell the jury a little bit about the source of

1 the disagreement or the discussion between the systems
2 folks and the design folks.

3 A. Well, the concern among the design folks -- well,
4 first of all, what systems wanted to do -- so they had been
5 unsuccessful cleaning the head with the traditional
6 mechanical means, with just going in with a vacuum and
7 trying to vacuum it up. So they wanted to use a high
8 pressure -- not high pressure, but high temperature water
9 at 140 degrees water and pressure wash it off. And this
10 had been a process that had been used on -- that they had
11 been using -- they, systems engineering had been using on
12 the containment air coolers to clean boron deposits off
13 them. So they wanted to use the exact same equipment, the
14 same approach on the head. The concern that design
15 individuals had, specifically Prasoon and Theo, was that
16 they didn't want the boron to go -- which was in a dry
17 state. They didn't want it to go back into a wet state.

18 Q. What decision was made about how to clean the
19 head?

20 A. It was decided it was more important to get the
21 boron off the head so we need -- we went ahead with the hot
22 water wash.

23 Q. Did there come a time that you were in outage
24 central during 12 RFO?

25 A. Yes. I -- I -- a little history there, I took --

1 once again, I took the manager role about a week before the
2 outage started in March of 2000. It didn't seem like it
3 was any time at all before the outage actually started, but
4 I was spending the first part of the outage learning the
5 job basically, learning the people, learning -- learning,
6 you know, who worked for me.

7 Meanwhile, the outage is going on, and Theo Swim
8 had been placed on the outage. We called it outage
9 central, but it was a conference room where representatives
10 from all different groups in the plant convened together
11 and monitored the outage. And for about the first three,
12 three-and-a-half weeks, he was in that role. And that's
13 kind of a burn out role for him because you -- I mean,
14 you're doing 12-hour days, seven days a week.

15 Q. Did there come a time when you replaced him?

16 A. Yes, he was getting burned out, so I volunteered
17 to take his spot.

18 Q. While you were in outage central -- strike that.
19 Sorry.

20 As you've been in this courtroom, do you recall
21 seeing a photograph that the prosecutors are referred to as
22 the red photo?

23 A. Yes, I have.

24 Q. And that's a photo that depicts boron coming out
25 of the weep holes during 12 RFO, correct?

1 A. Correct, I think that was from the as-found
2 inspections.

3 Q. Did you see that picture in 2000 when you were in
4 outage central?

5 A. I think I saw it floating around pictures, copies
6 of it floating around in outage central.

7 Q. Do you recall what your reaction was to seeing
8 that photograph?

9 A. Just looked like something we would obviously
10 have to address, but it didn't really alarm me at the time.

11 Q. Do you recall what you thought the source of the
12 boric acid was in the photographs?

13 A. I really didn't think about it that in-depth. By
14 the time I had gotten to the outage central, that
15 inspection had long since been done. So I guess I really
16 didn't think much about it.

17 Q. Did you think what you were seeing was boron
18 coming out of corrosion on the reactor vessel head?

19 A. No, I thought that the leakage we were seeing was
20 similar to the leakage we had seen in previous outages,
21 that because the plant had a history of flange leakage,
22 although I hadn't been involved with previous inspections,
23 I was well aware that we had gone in and repaired flanges.

24 Q. You said that that photo didn't alarm you or
25 cause you concern at the time. As you see it now, do you

1 have a different feeling about it now?

2 A. Well, I think my entire prospective of things is
3 different when you've got 20/20 hindsight of knowing that
4 you've got a cavity on the head. You tend to reevaluate
5 everything that you looked at.

6 Q. As you -- as the plant left the 12th refueling
7 outage, what was your belief about whether the reactor
8 vessel head had been completed and successfully cleaned?

9 A. I believe it had been completely cleaned.

10 Q. Do you recall why you thought that?

11 A. I believe there was a presentation part of the
12 restart readiness, but I don't -- I'm not 100 percent
13 certain. This is a long time ago.

14 Q. Are you familiar with a publication called The
15 Outage Insider?

16 A. I am familiar with it. I have seen it here at
17 the trial, copies of it. I've got to be honest that I
18 don't actually remember it that well from that long ago. I
19 did have a habit of reading all of The Outage Insiders as
20 well as the online document.

21 Q. Was it required reading for the managers?

22 A. There was nothing that was written down that said
23 you shall read this, so I mean, required, it was expected
24 reading.

25 Q. Okay. When did it come to your attention, or

1 when did you learn that the head had, in fact, not been
2 cleaned successfully coming out of 12 RFO?

3 A. That would have been sometime in October of 2001
4 after we started -- I know it was after the meeting on the
5 3rd of October.

6 Q. Do you recall how that came to your attention?

7 A. No, I don't.

8 Q. Do you recall reading the report from Mr. Gibbs?

9 A. No. I know that he sent a quick copy in my in
10 basket, but quite frankly, I don't have a recollection of
11 ever reading it. Not to say that I didn't, I just don't
12 have any recollection of it.

13 Q. Did you ever discuss the letter with Mr. Gibbs?

14 A. No.

15 Q. Did you have conversations in the October of 2001
16 time frame with Mark McLaughlin?

17 A. I might have, but I don't recall.

18 Q. Let me ask you this: When you did learn --

19 A. Let me rephrase it, I did have a lot of
20 conversations with Mark, but on that specific issue, the
21 Gibbs report, I don't recall ever discussing it with Mark.
22 Is that what you're getting at.

23 Q. No, I'm sorry, I wasn't clear. Do you recall
24 whether you had discussions with Mr. McLaughlin about the
25 fact that the head had not been entirely cleaned at 12 RFO?

1 A. I don't recall anything specific about that.

2 Q. In October of 2001 when you said you learned this
3 information, what were you doing at that time?

4 A. Well, there was a lot of things going on in
5 October. We were still -- as a group, we were still trying
6 to get our modifications complete for 13 R -- we were
7 behind. Not so much behind on the ones that were
8 identified, but there was some late identified. We had
9 about 26 mods that were late, identified for 13 R, so we
10 were working on that as a group. I also had two actions
11 that I was responsible for oversight on. One was the
12 development of crack growth rate model. Ken Byrd, who was
13 one of my engineers, he worked underneath Ted Lang in the
14 nuclear engineering group was working on that. And then
15 there was the nozzle-by-nozzle table that Andrew Siemaszko
16 was putting together.

17 Q. When you learned that the head had not been
18 cleaned coming out of 12 RFO, what, if any, significance
19 did that have to you at the time you learned it?

20 A. It really didn't have a big significance because
21 my -- the two things I was focusing on was really tied to
22 as the -- as the as-found inspections going into 12 RFO,
23 going into 1998, the 11 RFO. It really didn't -- now
24 you're talking about the as -- the as-left, which would
25 have been packed at our inspections for 13 RFO, which Mark

1 McLaughlin had the lead on that. Mark is a very capable
2 engineer, so I was letting him take care of that.

3 Q. Let me take you back to the end of 2000,
4 beginning of 2001. Can you tell me at that time frame what
5 involvement you had with issues relating to nozzle
6 cracking?

7 A. When I became the design basis engineering
8 manager, there was a lot of collateral duties that came
9 along with that. I already mentioned the Corrective Action
10 Review Board. Another one was being the station's rep, the
11 plant rep for the B & W steering committee.

12 Q. Tell the jury a little bit about what the
13 steering committee did.

14 A. What the steering committee -- well, the owners
15 group is -- probably better to start with the owners group.
16 What an owners group is, plants of the same ownership, same
17 design, get together and form an owners group. And that --
18 there's -- there's a Westing House Owners Group. There's a
19 combustion owners group, and there's a B & W owners group.
20 There's also General Electric Owners Group. And the
21 purpose of the owners group was to address issues that were
22 common to all the plants so that you've kind of got an
23 economies of scale. So the steering committee was set up
24 to -- because you can come up with a lot of different
25 things that you want to go work on. Every plant's going to

1 come into the mix with a, hey, I'd like to look at this,
2 I'd like to fix this, I'd like to do this. Let's work on
3 it together. And before you know it, you get completely
4 overwhelmed with projects. So the steering committee,
5 their goal was to ferret through all those and pick the
6 highest priority ones to work on.

7 Q. Did the steering committee deal with issues from
8 a high general level or in a plant specific level?

9 A. At -- basically not -- I can't say plant specific
10 level because it was a fleet level, so it was a higher
11 level, but we did have a group that was above us.

12 Q. Did you -- as by virtue of your service on the
13 steering committee, did you come to know about what had
14 been found at the Oconee plant?

15 A. Yes.

16 Q. And did there come a time that you made
17 presentations at Davis-Besse about what had happened at
18 Oconee?

19 A. Yes.

20 Q. Do you recall when those presentations were?

21 A. The first -- I can't tell you the exact date. It
22 would have been the spring of 2001, first presentation was
23 to the management team. The managers themselves, and there
24 was a presentation that was made to Mr. Marefield
25 (phonetic).

1 Q. What were the purpose of those presentations?

2 A. Just to bring everyone up to speed on what had
3 happened at Ocone because it was -- specifically what
4 happened at Ocone 3 because that was a new event.

5 Q. Did you speak about how those issues could impact
6 Davis-Besse or what relevance they had to Davis-Besse?

7 A. I may have, I -- I'd have to go back and review
8 the presentations.

9 Q. In order to makes those presentations, did you
10 collect information about Davis-Besse's past inspection
11 history?

12 A. No. This was more of a discussion on the
13 cracking phenomenon that we were seeing, and I use the word
14 phenomenon because I had seen a circumferential crack
15 before it had always been axial cracks.

16 Q. I'm going to show you what has been admitted as
17 Government's Exhibit 22 --

18 A. Okay.

19 Q. -- which is an e-mail from Prason Goyal to
20 Mr. Siemaszko on which you were CC'd dated December 13th,
21 2000. Do you recall seeing this e-mail during Mr. Goyal's
22 testimony?

23 A. Yes.

24 Q. Have you reviewed it in preparation for your
25 testimony here today?

1 A. Yes, I have.

2 Q. Do you have a specific recollection of receiving
3 this e-mail in December of 2000?

4 A. No, I don't, but it was obviously CC'd to me. I
5 just don't recall it.

6 Q. Will you take a look at the text at the bottom of
7 the e-mail?

8 A. Yes.

9 Q. As you look at that text and think back to what
10 was known to you by virtue of your work on the steering
11 committee, would this e-mail have told you anything that
12 you did not already know?

13 A. No.

14 Q. How many E-mails would you guess you got in a day
15 in your job as manager of design basis engineering?

16 A. It varied. It would be anywhere from 20 to 50.

17 Q. Did you have any discussions with Mr. Goyal about
18 this e-mail?

19 A. No.

20 Q. Or about what he had learned about Oconee?

21 A. No, but I mean, this was just an FYI from him, so
22 I think he was just trying to tell me what was going on at
23 his level within the owners group.

24 Q. This is Government 23. I'll ask you to take a
25 look at this document. Do you see it on the screen,

1 Mr. Geisen?

2 A. Yes.

3 Q. Do you recognize this as a trip report?

4 A. That's correct.

5 Q. To Mr. Swim from Mr. Goyal?

6 A. That's correct.

7 Q. Do you recall Mr. Goyal testifying about this --

8 A. Yes, I do.

9 Q. -- trip report? Have you reviewed this in
10 preparation for your testimony today?

11 A. Yes, I have.

12 Q. Do you have any specific recollection of
13 reviewing this trip report in January of 2001?

14 A. No, but I -- I read all the trip reports that
15 came in, so I'm sure I saw it.

16 Q. Can you tell the jury a little bit about why trip
17 reports are generated?

18 A. Well, you spend a lot of money sending people out
19 on these trips, and you want to -- you want to make sure
20 that you're getting something back in terms of what did
21 they learn. And it's often very easy for someone to go out
22 on trips and say, you know, it was a great trip, I learned
23 a lot, but if they don't tell anybody, you really
24 haven't -- the site hasn't learned anything. So I had made
25 it a policy within design that you will create a trip

1 report, and for every trip summarizing what the trip was
2 about, any lessons learned, and you will forward that to --
3 other than myself, but it would go to all the supervisors
4 within the group, so if the supervisors and I had an
5 expectation of the supervisor to review it, are there
6 things here that I want to pass along to the people in my
7 group.

8 Q. I take it you read the trip reports when they
9 came to you?

10 A. Yes.

11 Q. Do you have any recollection of discussing this
12 trip report with Mr. Goyal?

13 A. No, I didn't talk --

14 Q. Or with Mr. Swim?

15 A. No.

16 Q. Let me call your attention to the first bullet
17 point, and specifically to the second sentence where it
18 says at Oconee, they were able to find this leak because
19 their CRDM flanges do not leak, and the head was in
20 pristine condition. Do you see that sentence?

21 A. Yes.

22 Q. What was your understanding in January of 2001
23 about the condition of the RPV head at Davis-Besse coming
24 out of 12 RFO?

25 A. I was still under the impression that we had

1 cleaned it successfully with the hot water.

2 Q. As you look at this e-mail as you sit here today,
3 is there anything in this -- I'm sorry, strike e-mail, trip
4 report. As you look at this trip report, as you sit here
5 today, is there anything in this document that would have
6 caught your attention as being different from what you
7 already knew?

8 A. No, because we had already discussed this as a
9 steering group.

10 Q. This is Government 25?

11 THE JUROR: Excuse me, shouldn't the jury be
12 seeing this too?

13 MR. WISE: Yes. I am very sorry. Thank you.

14 BY MR. WISE:

15 Q. Mr. Geisen, we're going to go back to Mr. Goyal
16 to Mr. Siemaszko, the text of the e-mail is about what
17 Ocone has found at Ocone 1, correct?

18 A. Yeah, specifically Ocone 1.

19 Q. And what was your testimony about whether this
20 information was something new from what you had learned at
21 the steering committee?

22 A. It was the same information we had been told by
23 the steering committee, rather.

24 Q. And you did not have any follow-up discussions
25 with Mr. Goyal about --

1 A. No, I didn't.

2 Q. The second one that we just discussed was the
3 January 30th trip report from Mr. Goyal to Mr. Swim?

4 A. Correct.

5 Q. Okay. Let's go back to that bullet point.

6 A. Yeah, the second bullet.

7 Q. Well, take a look at the first bullet, second
8 sentence. It discusses that the head was in pristine
9 condition?

10 A. Correct.

11 Q. And you said that was consistent with your
12 understanding of Davis-Besse's head at the time?

13 A. Correct.

14 Q. Let me put up Government's 25. Do you recognize
15 this as an e-mail from Mr. Goyal to Mr. Siemaszko CC'd to
16 you?

17 A. Yes.

18 Q. Do you recall seeing this e-mail in March of
19 2001?

20 A. No, I don't.

21 Q. Okay. Have you reviewed it in preparation for
22 your testimony today?

23 A. Yes, I have.

24 Q. Tell me the significance of what Mr. Goyal is
25 reporting about the Ocone 3 nozzles.

1 A. Well, the significance is that Ocone had 60 out
2 of 69 of their nozzles were all made out of the same heat
3 of material. And Davis-Besse had five nozzles that were
4 made out of that same heat. So at this point, since we
5 didn't have any kind of failure analysis of the Ocone 3
6 plant and the circumferential crack, we were just trying to
7 look at anything. So this was just trying to say next time
8 we do an inspection in 13 R -- or excuse me, 13 RFO, let's
9 make sure to pay special attention to this.

10 Q. Throughout that last answer, you've been using
11 the word we.

12 A. I'm sorry.

13 Q. Who was working on this issue at Davis-Besse?

14 A. This was where Prasoon had sent this to Andrew
15 Siemaszko, because he would have been the one that would
16 have been -- he's the owner of the reactor vessel as a
17 system, and so he would have been involved with the
18 inspection.

19 Q. Were you working with Mr. Goyal on issues
20 relating to nozzle cracking?

21 A. Not directly. Prasoon was involved with working
22 with some issues on the MRP.

23 Q. Does the heat issue that's mentioned in the
24 second paragraph have anything to do with what you just
25 heard Dr. Bullen testifying about regarding various heats

1 from which nozzles were made?

2 A. Oh, I think we know now that it has a big thing
3 to do with it. It's got much higher, I think he testified
4 up to eight times higher crack growth rate.

5 Q. In March of 2001, did this e-mail have any
6 particular significance to you?

7 A. Not at that point, no.

8 Q. Did you -- were you aware of the information
9 that's contained in this e-mail from the steering group
10 when you received this e-mail?

11 A. Yes.

12 Q. As you look back on it now, does this e-mail have
13 a different significance to you than it did at the time?

14 A. Absolutely, because we know that that heat is
15 highly susceptible to cracking at most, so I would say
16 more -- not more susceptible to cracking, but once a crack
17 is induced in it, it perpetuates at a much faster rate than
18 other heats.

19 Q. I'm putting on the screen Government's Exhibit
20 26, which is an inner company memorandum dated June 27th
21 from Mr. Goyal. Do you recall Mr. Goyal's testimony about
22 this document?

23 A. Yes, I do.

24 Q. Do you recall that this was a document that you
25 signed?

1 A. On page 3, correct.

2 Q. As an approver?

3 A. That's correct.

4 Q. I believe that the jury was told that this
5 document was a JCO. Can you tell the jury, first of all,
6 what a JCO is?

7 A. JCO stands for -- well, this is not a JCO, but
8 JCO stands for -- is a justification for continued
9 operation. And my understanding is it's a formal agreement
10 or a formal evaluation between the station and the
11 government and the NRC. I know that a later time we saw --
12 or what I saw earlier was Mr. Goyal had put a cover sheet
13 on this and labeled this always a JCO.

14 Q. What is this document that you're looking at
15 right now?

16 A. Well, this document -- well, it's kind of
17 captured in the first paragraph. In the question there
18 says should Davis-Besse perform a visual inspection if the
19 plant shuts down to mode five conditions. What we had at
20 the station so you could avoid a lot of chaos or when it --
21 if and when the plant were to trip off line.

22 Q. What does that mean?

23 A. I'm sorry, if the plant, for whatever reason,
24 were to shut down automatically, and it could be for a lot
25 of reasons I mean, in 1998, we were shut down by a tornado.

1 So in the event that you do shut down, there's -- before
2 you go and start up, there may be work that you want to do
3 that you can't do when the plant's up and operating. And
4 so we actually maintain two different work lists. We have
5 a mode three work list and a mode five work list. Both
6 require the plant to be shut down, but mode five required
7 it to be shut down, cooled down and depressurized.

8 So what this was really asking the question of
9 should we be putting things in place in case we were to
10 trip and go to mode five, should we have everything in
11 place for work orders, contracts, whatever we needed for
12 doing an inspection.

13 Q. By June of 2001, was there a sense at Davis-Besse
14 that the NRC was going to take some follow-up action on the
15 findings at Oconee?

16 A. I know that we had already had an information
17 notice out by then. That came out shortly after the Oconee
18 three. I can't tell you. I know there was a discussion at
19 some point during the summer that there's probably going to
20 be a bulletin coming out, but I couldn't tell you when that
21 discussion occurred.

22 Q. We discussed, I think, before that you signed
23 this document as approved?

24 A. That's correct.

25 Q. Would you have read this document?

1 A. Yes, I did.

2 Q. Would you have read it closely?

3 A. Yes.

4 Q. I'm going to show you page 2 of the document. In
5 June of 2001, what was your understanding as to the
6 condition of the reactor vessel head coming out of 12 RFO?

7 A. Once again, that we had cleaned it successfully
8 with the hot water.

9 Q. Take a look at the last paragraph of this second
10 page, specifically the fourth line.

11 A. Where it says the flange was repaired and the
12 head was cleaned?

13 Q. Correct. Is that a reference to 12 RFO?

14 A. That's correct.

15 Q. Did anything in this document from Mr. Goyal
16 change your opinion in June of 2001 about the condition of
17 the head coming out of 12 RFO?

18 A. No, it didn't.

19 Q. Did you ever have a discussion with Mr. Goyal
20 about this memorandum?

21 A. May very well have. I don't recall it, but, I
22 mean, it would be highly unusual for him to bring in a
23 document like that. That requires my approval signature,
24 and not discuss it with either he or Theo Swim, discuss it
25 with me. I mean, morally if you're going to go get

1 approval signature of someone above you, you take the
2 document to them and discuss it with them.

3 Q. Do you recall any discussion with Mr. Goyal about
4 language that he had had in this document being omitted at
5 Mr. Swim's request?

6 A. No, I don't.

7 Q. Would that have caused you concern if he had
8 suggested that to you?

9 A. I probably ask was he happy with the revision.

10 Q. This is Government's 27, which is an e-mail from
11 Mr. Goyal to Mr. Siemaszko, CC'd to you and others. Do you
12 recall Mr. Goyal testifying about this document?

13 A. Yes, I do.

14 Q. Did you review this in preparation for testifying
15 today?

16 A. Yes, I did.

17 Q. Do you have any specific recollection of
18 receiving this e-mail back in July of 2001?

19 A. No, but I'm CC'd on it so I probably did.

20 Q. Can you tell the jury what this e-mail is about?

21 A. Yeah. Prasoon was our site recipe for the EPRI
22 MRP. And they were --

23 Q. I'm sorry?

24 A. I'm sorry.

25 Q. What is the EPRI MRP?

1 A. EPRI stands for Electric Power Research
2 Institute. They are a -- they do a lot of work for the
3 electric industry, and there's a lot of committees and
4 stuff that we participate on. They have a group that's
5 called the MRP and it's called materials reliability
6 program. And that was like a sub committee. So when I say
7 EPRI MRP, the MRP is a sub committee of EPRI, and Prasoon
8 was on that committee.

9 Q. And what is it that is being discussed in this
10 e-mail?

11 A. Well, they -- at this time frame, the NRP was
12 developing what they called a susceptibility model and they
13 were trying to range all of the pressurized water reactors
14 in the country based upon simple but, you know, a series
15 of, I don't know, criteria. They were talking about age,
16 then they went just the age from based on what your
17 temperatures is that your head was operating at. And there
18 was a form data verification form as the title implies.

19 Q. What is the form asking for information about?

20 A. It had a lot of information on there, but
21 specifically what Prasoon was asking Andrew about was to
22 verify that the information in the inspection column was
23 correct.

24 Q. In July of 2001, were you involved in past
25 inspection information?

1 A. No, I wasn't.

2 Q. Were you involved in communications with the MRP?

3 A. No.

4 Q. Do you have any specific recollection as you sit
5 here today of receiving this e-mail?

6 A. No, I don't.

7 Q. Do you know who -- at the time, did you know who
8 had done the 2000 inspection?

9 A. No, I did not at that time.

10 Q. What would you have taken from this e-mail on
11 July 10th, assuming you saw it?

12 A. It was sent to -- I would take it as Prasoon is
13 asking Andrew, who is in a different department, to do
14 something for him. And I think out of courtesy, he was
15 CCing it to Andrew's supervisor, Andrew's supervisor
16 manager, and then his -- you know, Prasoon's supervisor and
17 me.

18 Q. There came a time in October of 2001 where you
19 had -- you were parting interactions with the NRC regarding
20 past inspections, correct?

21 A. That's correct.

22 Q. When you had those discussions in October of
23 2001, did you have any recollection of this July e-mail?

24 A. No.

25 Q. Showing you a trip report marked as Government's

1 Exhibit 28 from Mr. Goyal to Mr. Swim --

2 A. Correct.

3 Q. -- dated July 12th. Do you recall Mr. Goyal
4 testifying about this document?

5 A. Yes, I do.

6 Q. What do you recall his testimony was about, what
7 this document was written for?

8 A. Well, once again, it was a -- it was a trip
9 report for a trip that he attended with the MRP, and it
10 says right in the first sentence, June 13th, 14th and 15th.

11 Q. Have you reviewed this document to prepare for
12 your testimony today?

13 A. Yes, I have.

14 Q. Do you have any recollection of receiving this
15 document in July of 2001?

16 A. Not specifically, but once again, it was a trip
17 report. I tried to make a point of reading all trip
18 reports.

19 Q. Based on what's in the document about the lessons
20 learned at Oconee, is there anything in this document that
21 would have either changed what you then believed to be true
22 or caused you concern?

23 A. No.

24 Q. Government 36 is an e-mail from Mr. Goyal to you.

25 A. Correct.

1 Q. Do you recall Mr. Goyal's testimony about this
2 document?

3 A. Yes, I do.

4 Q. Were you at the meeting that the e-mail is about?

5 A. No, I wasn't.

6 Q. From looking at the e-mail, can you tell what the
7 purpose of the meeting was?

8 A. I would guess that this was probably a work scope
9 committee meeting.

10 Q. And what is the work scope committee?

11 A. Well, the work scope committee was like -- that
12 was the directors that would approve large projects, they
13 would fund large projects. Basically to get a project
14 modification or anything, it proved that the plant was kind
15 of a two-tier approach. If you were like -- let's say you
16 were an engineer and you came up with an idea and you first
17 bring it to the project review committee, which was staffed
18 with managers, make your pitch and then if -- then it would
19 go from there up to the work scope committee, which was
20 staffed by the directors, I'm just guessing at that point,
21 because I look at the attendance here and with the
22 exception of licensing, everyone else was a director.

23 Q. Do you recall receiving this e-mail in August of
24 2001?

25 A. No, I don't.

1 Q. Did Mr. Goyal ever come and talk to you about
2 either the e-mail or the meeting that the e-mail's about?

3 A. Not that I recall.

4 Q. As you look at the two paragraphs below the list
5 of names of people at the meeting, can you tell the jury
6 how you believe you would have analyzed this e-mail,
7 assuming you received it?

8 A. Well, there's a lot of discussion about what we
9 have to do for inspections in 13 RFO. And there's
10 obviously a lot of discussion on do we have to have some
11 sort of plans or scenarios worked up for what if we find
12 cracks and what we have to do to fix those.

13 Q. In August of 2001, who was tasked with leading
14 the preparations for 13 RFO?

15 A. Mark McLaughlin.

16 Q. Let me call your attention to the third paragraph
17 that starts I indicated. Do you see where I'm looking at?

18 A. Yes, I see that.

19 Q. And specifically to the sentence that begins on
20 the second line and reads it was pointed out that we cannot
21 clean our head through the mouse holes. Do you see that
22 sentence?

23 A. Yes, I see that.

24 Q. Do you have any recollection of reading that
25 sentence in August to be telling you that the head had not

1 been cleaned in 12 RFO?

2 A. No, I didn't. I didn't read this that way at
3 all.

4 Q. How do you know that you didn't read it that way?

5 A. Well, because I think it would have stuck in my
6 mind that we hadn't cleaned the head at that point.

7 Q. And what would that have meant to you?

8 A. Well, I mean, we had said -- I was operating on
9 the premise all along that we had a pristine head. I mean,
10 when I look at this, the thing that jumped out in my --
11 when I reviewed this for this testimony is Andrew Siemaszko
12 requesting three large holes to be cut in the service
13 structure, review any cleaning, and we already had a
14 modification on the books to cut, I think it was seven to
15 nine holes for that very thing. So I'm just guessing that
16 at the time, I just chalked this up to, yeah, this is
17 further ratification that we want to get this modification
18 done.

19 Q. And did Mr. Goyal ever come talk to you about how
20 the head had been left at 12 RFO?

21 A. No.

22 Q. When you say you thought the head was pristine,
23 are you talking about how it was found at the beginning of
24 12 RFO or how it was left?

25 A. How it was left. And I don't think I ever used

1 the word pristine, but, you know --

2 Q. Oh, I believe you did.

3 A. Did I?

4 Q. Let me just ask you, though.

5 A. I know we cleaned it with hot water with the idea
6 of getting all the boron off.

7 Q. Can you tell the jury what the difference is
8 between as left and as found as it relates to going
9 forward?

10 A. Well, any time that you do the inspection to look
11 for leakage, you really want to do your as found because
12 the leakage manifests itself at pressure. And so you shut
13 down, you go in, do your inspection looking at did anything
14 occur while I was at pressure, did anything leak out. Once
15 you clean the head and then you do an as left, that as left
16 inspection is really intended to be a baseline for your
17 next as-found inspection.

18 Q. Let me show you one last e-mail. This is
19 Government's Exhibit 40, which is from Mr. Goyal to
20 Mr. Fyfitch on which you are CC'd.

21 A. Correct.

22 Q. Did you review this document in preparation for
23 your testimony today?

24 A. Yes, I did.

25 Q. Do you have any specific recollection of seeing

1 this in August of 2001?

2 A. No, but I -- once again, I was CC'd on it, so I'm
3 sure I probably got it.

4 Q. What is your understanding of what Mr. Goyal was
5 doing at the time that he sent this e-mail to Mr. Fyfitch?

6 A. Well, in reading through the document, there was,
7 once again -- I mentioned earlier he was on the MRP, and
8 they were developing a susceptibility model. And in that
9 susceptibility ranking model, we end up coming out as a
10 plant that was within five -- it says EFPY, which stands
11 for Effective Full Power Years of Oconee 3.

12 Q. What's the subject matter of the e-mail?

13 A. It talks about the NRC bulletin.

14 Q. Do you understand that to be bulletin 2001-01?

15 A. Is it? I'm assuming that's what it would apply
16 to. That was the only bulletin I think we had at the time.

17 Q. Were you involved on August 17th of 2001 in the
18 drafting of the response to bulletin 2001-01?

19 A. No.

20 Q. Take a look at the statement at the very bottom
21 of the first paragraph where Mr. Goyal asks, is it possible
22 to go back to 1998. That is when a good head exam was done
23 with no nozzle leakage, meaning not taking credit -- taking
24 any credit for 2000 inspection. Do you see that sentence?

25 A. Yes, I do.

1 Q. In August of 2001, did you believe that the 2000
2 inspection had been a full and complete inspection?

3 A. I don't think I really even thought about it that
4 much. I hadn't even seen the response yet, the 2731, so I
5 often ask myself that question.

6 Q. Would it, seeing this e-mail, have caused you any
7 concern?

8 A. No, I took it as he was trying to -- Framatome is
9 working on doing some gap analysis with regard to the weld,
10 and I think that was just a continuing part of that. We
11 had -- I think there was testimony made that SIA did gap
12 analysis for us. Framatome did some for us as well.

13 Q. We have just looked at nine documents from
14 December of 2000 through August of 2001. In that
15 eight-month period, can you estimate how many trip reports
16 you received per week on average?

17 A. Probably about one a week on average.

18 Q. How many e-mails did you receive per day on
19 average?

20 A. Probably anywhere from 20 to 50, depending on the
21 day.

22 Q. Do you recall any discussions with Mr. Goyal or
23 anyone else on any of those documents that I've just showed
24 you?

25 A. No.

1 Q. Tell the jury a little bit about what you were
2 doing in your job in August of 2001.

3 A. Well, August of 2001 was -- was -- was a tough
4 month. And given the fact that we had had -- I mentioned
5 there was a lot of problems within the design basis group.
6 And actually, I was actually challenged by the site vice
7 president to come up with an action plan to address
8 shortcomings within the design group. I provided an action
9 plan in October of 2000. And there was ten pretty
10 significant improvement initiatives. We're talking about
11 design calculation reconstitution, stuff like that. And a
12 lot of those issues dealt back to some audit -- I keep
13 saying audit finance, but it really is AFI is Area For
14 Improvement is what it stands for, but it sure felt like
15 about an audit finding. But these were things from Impo,
16 that in previous Impo evaluations, that he had provided a
17 lot of shortcomings in our group. So we were trying to get
18 those up to speed. Impo was coming back in for the next
19 inspection in September. And so the month of August was
20 spent a lot of time in prep work for -- that Glenn McIntyre
21 had been pulled out of his role as a supervisor and put
22 into a full time role to prep for the -- for the Impo team
23 coming in, and I was one of the engineering people that was
24 on his -- helping on the team to get ready.

25 In addition to that, I mentioned these ten

1 improvement initiatives that we had self assessments that
2 we were rung through the month of July and August so that
3 when Impo came in, we would at least look polished and
4 prepared, may not be completely done with all the
5 improvement issues, but at least we could go and say this
6 is how far we've come, you know, we've made a real good
7 faith effort to really square away the design group, and
8 this is what we have left to do. So we were kind of
9 benchmarking where each one of those initiatives were at
10 the time.

11 Q. Aside from the Impo preparations, were there
12 other things that you were working on in your role as
13 manager of design basis engineering in August of 2001?

14 A. No. We were trying to get our mods done for 13
15 RFO.

16 Q. What does that mean?

17 A. The modifications, the -- by the time August
18 rolled around, our -- our due date had already passed for
19 getting these mods done, we'd try to get them done like
20 nine months ahead of time. And we had stragglers, I think
21 I mentioned earlier we had about 26 that were issued after
22 the freeze date or after the due date for various reasons.
23 Some were because they were late identified, but we were
24 scrambling to get those done, and every design package
25 that's issued is personally signed off by myself as the

1 design managers.

2 Q. You are aware that bulletin 2001-01 was issued on
3 or about August 4th of 2001?

4 A. That's correct.

5 Q. Were you involved in the drafting of
6 Davis-Besse's initial response 2731?

7 A. No.

8 Q. Were you assigned to any specific answers in that
9 response?

10 A. No.

11 Q. Were you involved in meetings about reviews of
12 the drafts that were being passed around in preparation to
13 submit a final response?

14 A. No, I wasn't.

15 Q. Were you involved in the greensheet?

16 A. Yes, I was.

17 Q. What was your understanding of your role in the
18 greensheet review of 2731?

19 A. Well, if you look at the greensheet, there are
20 several managers' names or positions -- not names but
21 positions, design basis engineering being one of them, that
22 are like preprinted on the greensheet. And it's because
23 most of the greensheets always come to those managers. And
24 my role was to go through, read the document, make sure it
25 made sense to me but at the same time verify that the right

1 people participated in the preparation of that document,
2 and that they had also had reviewed and signed the
3 concurrence of that document.

4 Q. What was the date of your first personal
5 interaction with the NRC regarding the bulletin?

6 A. That would have been October 3rd we had a
7 teleconference.

8 MR. WISE: Judge, I'm sorry, I have not gotten as
9 far as I would like. This might be a good time to break
10 for the evening if The Court so wish.

11 THE COURT: Thank you. Ladies and gentlemen, I
12 had discussed with counsel beforehand that if he felt he
13 could finish by 5:15 or so, 5:30 at the very latest, we
14 would continue with Mr. Geisen. It appears that that will
15 not be the case, and so rather than keep you and breaking
16 at an -- at a rather opportune time, we'll break now. Can
17 we start tomorrow morning at 8:30?

18 Very good. 8:30 tomorrow morning. All right
19 with all counsel?

20 MR. WISE: Yes, Your Honor.

21 THE COURT: Very good. Please remember as we
22 part, as I have in each of the days we have parted, that
23 you are not to discuss this case among yourselves, nor with
24 anyone else, nor permit anyone to discuss it with you.
25 Please do not read, watch, listen to anything touching on

1 this case in any way. Please do not make up your mind on
2 the ultimate issues which you will determine at the end of
3 the case, where there are more witnesses to be heard, the
4 arguments of counsel, and The Court's instructions. Enjoy
5 your time away. We'll see you at 8:30 in the morning.

C E R T I F I C A T E

I certify that the foregoing is a correct transcript
from the record of proceedings in the above-entitled matter.

Angela D. Nixon, RPR, CRR

Date

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[4] 1833/18 1847/4 1859/6 1859/6</p> <p>added [1] 1777/1</p> <p>addition [9] 1647/24 1658/8 1689/23 1703/21 1729/1 1739/17 1752/1 1770/18 1859/25</p> <p>additional [1] 1713/24</p> <p>additionally [1] 1758/14</p> <p>address [7] 1651/18 1654/18 1710/22 1815/4 1832/10 1836/21 1859/7</p> <p>addressed [3] 1634/12 1656/10 1686/22</p> <p>addresses [2] 1651/8 1657/16</p> <p>adequate [1] 1631/5</p> <p>adjacent [2] 1722/5 1737/18</p> <p>admission [1] 1645/10</p> <p>admit [2] 1682/2 1811/9</p> <p>admitted [16] 1644/4 1645/1 1645/16 1686/14 1690/11 1719/13 1730/18 1730/21 1754/19 1759/4 1766/24 1779/20 1781/10 1784/13 1787/21 1838/16</p> <p>admittedly [1] 1647/16</p> <p>admonitions [3] 1705/14 1760/13 1810/25</p> <p>adopt [2] 1634/10 1643/1</p> <p>adopted [2] 1641/25 1807/18</p> <p>Adverse [1] 1782/7</p> <p>advertisement [2] 1672/5 1672/7</p> <p>affect [3] 1654/8 1655/2 1799/17</p> <p>affects [3] 1798/12 1798/18 1814/17</p> <p>affirmative [12] 1627/8 1627/16 1627/20 1628/1 1633/22 1634/13 1634/14 1634/20 1635/2 1636/20 1636/20 1637/3</p> <p>affirmatively [1] 1639/24</p> <p>affirming [1] 1785/8</p> <p>AFI [1] 1859/13</p> <p>after [63] 1629/3 1629/3 1630/5 1630/5 1632/3 1633/1 1633/2 1633/11 1645/8 1645/12 1647/2 1647/3 1649/18 1654/13 1660/12 1664/11 1664/12 1664/13 1666/8 1667/13 1672/13 1673/24 1683/12 1684/13 1684/17 1685/3 1699/11 1703/5 1703/12 1707/7 1714/7 1714/25 1725/10 1731/9 1732/14 1734/11 1734/15 1743/6 1751/17 1765/8 1765/21 1768/7 1769/24 1775/4 1776/22 1791/22 1794/13 1799/6 1799/14 1807/3 1807/6 1808/12 1811/15 1813/15 1815/1 1819/15 1819/19 1820/10 1834/4 1834/4 1847/17 1860/21 1860/22</p> <p>afternoon [5] 1773/15 1773/16 1810/24 1817/12 1817/13</p> <p>again [34] 1628/18 1630/1 1636/2 1640/22 1643/1 1657/1 1657/3 1661/14 1697/18 1719/4 1719/17 1721/25 1723/21 1726/16 1732/5 1753/4 1756/14 1764/18 1766/20 1767/13 1771/21 1783/13 1787/8 1799/2 1799/3 1800/22 1801/15 1824/5 1831/1 1848/7 1852/8 1852/16 1857/2 1857/7</p> <p>against [5] 1626/7 1633/18 1646/5 1661/20 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A August 17th [1] 1857/17 August 4th of [1] 1861/3 automatically [1] 1846/24 available [3] 1713/24 1734/13 1828/16 Avenue [3] 1624/14 1624/19 1625/9 average [11] 1737/4 1737/10 1737/11 1766/8 1767/7 1774/21 1813/9 1827/20 1858/16 1858/17 1858/19 averaged [1] 1827/23 averages [1] 1736/6 AVI [1] 1659/8 avoid [2] 1653/2 1846/20 aware [13] 1637/17 1684/16 1685/12 1748/23 1782/4 1795/9 1801/5 1801/25 1805/6 1805/11 1832/23 1845/8 1861/2 away [12] 1681/11 1699/4 1722/2 1729/18 1738/20 1742/22 1745/23 1772/6 1772/16 1807/8 1860/7 1863/5 axial [4] 1723/23 1801/13 1801/17 1838/15 axis [3] 1741/5 1741/7 1742/17	1817/21 1823/5 1827/12 1827/13 1828/12 1836/7 1839/15 1859/5 1860/13 1861/21 basket [1] 1834/10 batch [1] 1801/22 bath [2] 1743/22 1743/23 Bay [1] 1818/17 be [201] 1626/10 1626/23 1627/25 1628/2 1628/14 1628/17 1629/17 1630/20 1630/24 1630/25 1631/9 1631/16 1633/18 1634/11 1637/17 1638/24 1639/13 1641/1 1642/4 1642/7 1642/25 1644/16 1649/24 1650/1 1650/8 1652/18 1652/19 1657/12 1658/5 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1809/1 1810/16 1810/24 1813/8 1814/15 1814/25 1815/1 1815/4 1815/5 1815/12 1815/20 1815/23 1816/14 1816/22 1818/1 1818/4 1821/23 1824/15 1827/2 1827/9 1828/3 1828/15 1828/18 1833/17 1839/16 1842/11 1846/24 1847/2 1847/6 1847/7 1847/9 1847/20 1848/22 1852/21 1854/25 1855/12 1856/16 1857/14 1860/4 1862/9 1862/15 1863/3 bead [1] 1738/5 beads [2] 1738/7 1738/8 bearing [2] 1712/10 1824/2 became [12] 1665/21 1666/6 1666/10 1684/15 1685/12 1699/11 1713/24 1812/18 1823/5 1823/6 1828/22 1836/7 because [97] 1627/24 1631/5 1637/1 1637/11 1638/20 1644/15 1645/4 1647/8 1648/9 1651/11 1655/22 1660/15 1664/7 1664/10 1664/23 1666/24 1667/7 1670/5 1670/20 1670/24 1671/9 1673/14 1674/10 1691/8 1692/17 1692/17 1697/6 1698/21 1703/1 1719/11 1724/11 1726/8 1727/6 1728/2 1728/15 1733/4 1737/10 1739/5 1743/16 1744/2 1746/9 1750/9 1751/9 1752/3 1752/17 1756/10 1757/9 1757/11 1757/16 1758/1 1759/17 1765/18 1770/19 1772/14 1782/10 1784/25 1792/3 1792/18 1794/7 1795/2 1795/23 1797/17 1798/20 1799/20 1800/24 1801/12 1807/15 1807/22 1813/10 1814/23 1816/8 1822/19 1822/20 1823/25 1827/4 1827/13 1827/18 1828/5 1828/12 1829/19 1831/13 1832/21 1835/20 1836/24 1837/10 1838/3 1838/4 1838/14 1841/18 1842/8 1844/15 1845/14 1853/21 1855/5 1856/11 1860/23 1861/22 become [5] 1665/18 1712/5 1744/13	1775/10 1824/8 becomes [2] 1647/12 1813/4 been [123] 1628/11 1628/16 1629/21 1629/25 1631/1 1633/3 1633/7 1635/16 1640/5 1644/13 1646/15 1648/10 1648/11 1651/22 1655/5 1655/7 1655/8 1655/16 1657/13 1661/10 1661/13 1662/2 1662/24 1664/14 1664/24 1665/2 1665/15 1666/2 1666/8 1667/11 1669/18 1669/21 1670/12 1672/25 1673/8 1673/14 1677/23 1678/20 1683/1 1686/6 1686/14 1688/24 1688/25 1690/11 1693/20 1694/9 1701/19 1702/7 1708/6 1709/24 1709/24 1716/1 1718/1 1730/18 1730/21 1734/13 1735/23 1737/2 1738/20 1739/23 1740/4 1746/9 1747/13 1750/18 1753/25 1754/3 1757/7 1759/21 1761/20 1762/15 1762/18 1771/17 1772/22 1772/23 1773/9 1775/1 1787/18 1788/22 1790/12 1792/5 1793/2 1795/17 1799/1 1800/10 1801/16 1802/21 1804/17 1805/7 1806/23 1812/2 1814/4 1814/12 1826/3 1830/4 1830/10 1830/10 1830/11 1830/11 1831/8 1831/20 1832/15 1832/22 1833/8 1833/9 1834/1 1834/3 1834/25 1835/17 1835/25 1837/14 1837/22 1838/15 1838/16 1842/22 1844/10 1844/15 1844/16 1844/17 1855/1 1855/20 1858/2 1859/21 1862/6 before [56] 1624/9 1627/25 1630/12 1632/1 1644/3 1645/2 1645/4 1648/21 1649/9 1649/17 1650/8 1650/25 1650/25 1656/10 1656/25 1658/4 1658/9 1658/19 1659/21 1661/17 1664/10 1668/5 1668/22 1669/25 1675/25 1684/19 1685/10 1691/1 1698/8 1711/14 1719/5 1723/1 1734/24 1740/16 1745/18 1751/9 1758/2 1767/3 1783/2 1783/5 1786/6 1791/22 1809/9 1813/21 1814/19 1814/19 1818/20 1825/25 1826/13 1827/23 1831/1 1831/3 1837/3 1838/15 1847/1 1847/22 beforehand [1] 1862/12 began [10] 1651/15 1715/24 1716/1 1733/21 1763/15 1769/11 1791/22 1792/14 1803/14 1804/14 begin [2] 1646/12 1753/18 beginning [9] 1664/4 1664/6 1673/19 1732/9 1768/15 1769/9 1789/11 1836/4 1855/23 beginnings [1] 1718/6 begins [5] 1724/10 1724/13 1733/7 1753/19 1854/19 begun [3] 1669/6 1723/24 1804/2 behalf [5] 1624/23 1625/3 1640/13 1640/20 1719/9 behavior [1] 1630/25 behind [7] 1631/9 1636/15 1757/1 1757/14 1758/11 1835/7 1835/7 being [35] 1630/18 1631/1 1631/2 1649/18 1653/9 1655/14 1662/16 1675/17 1678/1 1680/25 1681/14 1691/16 1691/25 1697/15 1698/4 1699/6 1699/18 1701/21 1753/8 1755/19 1767/25 1785/6 1786/15 1787/12 1787/13 1788/12 1788/15 1826/18 1826/21 1836/10 1842/6 1849/4 1850/9 1861/12 1861/21 belief [2] 1630/12 1833/7 believe [26] 1626/19 1639/17 1641/9 1641/17 1645/1 1657/5 1659/10 1659/16 1661/19 1687/3 1690/10 1734/18 1785/21 1786/1 1793/16 1800/9 1811/21 1815/22 1822/18 1824/2 1833/9 1833/11 1846/4 1854/6 1856/2 1858/1 believed [1] 1852/21 believes [1] 1652/2 below [7] 1763/9 1763/11 1790/22 1794/9
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<p>B</p> <p>below... [3] 1825/11 1825/12 1854/4</p> <p>bench [1] 1805/19</p> <p>benchmark [1] 1685/6</p> <p>benchmarking [1] 1860/9</p> <p>beneath [1] 1716/11</p> <p>benefit [4] 1735/18 1740/12 1784/21 1815/9</p> <p>Bernard [1] 1706/6</p> <p>besides [2] 1795/3 1795/7</p> <p>Besse [77] 1626/23 1629/18 1631/17 1631/20 1631/25 1632/3 1632/20 1632/25 1648/24 1649/11 1650/21 1655/12 1663/13 1663/17 1663/18 1664/17 1665/5 1667/23 1669/19 1673/5 1673/24 1698/2 1698/13 1698/14 1710/15 1710/25 1712/20 1713/8 1713/15 1716/7 1716/16 1719/17 1735/6 1735/6 1736/8 1736/10 1736/20 1736/21 1736/25 1737/6 1737/14 1750/11 1752/8 1754/23 1758/21 1759/10 1761/4 1763/7 1766/10 1769/8 1775/7 1775/11 1776/4 1781/15 1782/2 1786/2 1787/7 1789/5 1789/10 1802/10 1802/17 1803/6 1803/10 1804/6 1817/18 1818/10 1820/11 1822/25 1823/4 1837/17 1838/6 1838/6 1841/23 1844/3 1844/13 1846/18 1847/13</p> <p>Besse's [5] 1761/6 1817/23 1838/10 1843/12 1861/6</p> <p>best [1] 1770/5</p> <p>better [10] 1664/2 1673/5 1694/15 1700/7 1717/12 1737/11 1753/1 1753/12 1815/2 1836/15</p> <p>between [27] 1630/11 1658/17 1663/13 1670/19 1715/19 1725/5 1725/6 1726/10 1728/13 1736/18 1746/19 1750/25 1751/19 1752/2 1755/6 1755/23 1755/24 1756/1 1758/9 1774/2 1805/7 1820/20 1826/4 1829/5 1830/1 1846/10 1856/8</p> <p>beyond [13] 1626/11 1626/23 1631/17 1631/20 1632/13 1635/12 1642/20 1647/21 1652/25 1659/25 1660/22 1660/25 1661/15</p> <p>bibles [1] 1638/6</p> <p>big [9] 1667/22 1720/22 1738/6 1745/13 1774/17 1826/23 1828/6 1835/20 1845/2</p> <p>bigger [1] 1727/6</p> <p>biggest [1] 1826/2</p> <p>binder [1] 1708/13</p> <p>bird [2] 1743/22 1743/23</p> <p>bit [24] 1663/7 1671/12 1684/14 1718/5 1718/5 1723/23 1731/23 1736/12 1741/9 1770/10 1777/5 1806/19 1818/12 1819/25 1820/19 1821/9 1824/11 1825/23 1826/10 1827/25 1829/25 1836/12 1840/16 1859/1</p> <p>black [1] 1784/20</p> <p>Blade [2] 1807/6 1808/24</p> <p>blank [2] 1767/9 1767/11</p> <p>blanket [2] 1814/6 1814/13</p> <p>blankets [2] 1668/21 1668/22</p> <p>blanks [1] 1767/12</p> <p>blouse [1] 1662/7</p> <p>blow [1] 1723/9</p> <p>blue [11] 1717/15 1720/11 1720/19 1720/20 1721/2 1721/6 1722/13 1723/25 1724/3 1727/2 1727/4</p> <p>blueprints [1] 1716/15</p> <p>board [7] 1638/22 1657/9 1708/10 1823/1 1823/2 1823/7 1836/10</p> <p>Bob [1] 1797/18</p> <p>Bockius [1] 1810/11</p> <p>bolt [1] 1716/24</p> <p>bond [6] 1725/11 1725/12 1725/12 1725/13 1733/1 1733/5</p> <p>bookkeeping [1] 1724/18</p>	<p>books [1] 1855/14</p> <p>boric [47] 1644/14 1648/25 1649/8 1649/10 1650/19 1650/22 1651/12 1658/22 1665/15 1687/14 1742/15 1743/20 1744/7 1744/13 1747/23 1747/25 1750/14 1756/11 1757/13 1759/19 1761/18 1762/18 1763/17 1763/25 1769/7 1769/9 1769/14 1769/16 1769/17 1770/2 1779/4 1780/3 1780/19 1781/14 1782/2 1782/9 1785/2 1787/15 1788/9 1788/13 1790/19 1793/18 1794/24 1794/25 1795/10 1801/1 1832/12</p> <p>born [1] 1660/7</p> <p>boron [49] 1670/22 1670/22 1671/13 1671/15 1671/17 1683/20 1684/16 1684/23 1685/8 1686/2 1686/8 1687/23 1689/20 1696/12 1697/8 1697/9 1697/11 1697/14 1701/1 1702/4 1702/7 1702/10 1702/14 1702/17 1726/15 1732/7 1747/12 1753/23 1754/24 1755/16 1755/18 1756/24 1756/25 1758/3 1758/8 1758/10 1758/13 1759/16 1762/5 1765/7 1765/11 1765/14 1796/1 1830/12 1830/16 1830/21 1831/24 1832/17 1856/6</p> <p>both [22] 1639/14 1644/17 1646/10 1646/11 1646/13 1649/17 1650/18 1658/20 1661/11 1669/3 1723/23 1732/12 1740/13 1743/13 1745/22 1787/2 1787/4 1787/9 1791/2 1791/11 1810/10 1847/5</p> <p>bottom [19] 1716/20 1717/16 1722/13 1732/10 1732/12 1741/24 1744/14 1750/13 1751/18 1751/24 1753/3 1769/1 1793/4 1793/20 1794/8 1796/2 1798/5 1839/6 1857/20</p> <p>bottom-up [2] 1732/10 1732/12</p> <p>box [4] 1723/14 1723/14 1723/15 1757/5</p> <p>brackets [1] 1721/16</p> <p>breached [1] 1768/3</p> <p>break [9] 1661/16 1662/18 1705/13 1760/7 1773/6 1810/24 1811/4 1862/9 1862/16</p> <p>breaking [2] 1816/23 1862/15</p> <p>Brian [1] 1685/2</p> <p>bridge [1] 1826/9</p> <p>brief [6] 1642/25 1661/23 1704/5 1705/19 1760/19 1811/6</p> <p>briefed [1] 1641/9</p> <p>briefing [2] 1627/22 1642/3</p> <p>briefly [1] 1640/22</p> <p>bring [13] 1628/6 1667/24 1686/17 1746/20 1793/21 1794/1 1807/10 1808/25 1812/16 1814/11 1838/2 1848/22 1853/17</p> <p>bringing [2] 1680/20 1809/7</p> <p>broken [2] 1714/4 1737/22</p> <p>brought [6] 1680/22 1699/4 1710/2 1765/23 1829/3 1829/4</p> <p>brown [1] 1717/15</p> <p>brownish [1] 1770/4</p> <p>build [3] 1795/18 1795/19 1795/21</p> <p>build-up [3] 1795/18 1795/19 1795/21</p> <p>building [2] 1788/23 1798/9</p> <p>bulbs [1] 1663/23</p> <p>Bullen [11] 1705/22 1705/23 1706/6 1708/23 1711/4 1711/24 1760/24 1773/15 1809/12 1810/6 1844/25</p> <p>bullet [4] 1841/16 1843/5 1843/6 1843/7</p> <p>bulletin [27] 1647/7 1647/10 1648/2 1649/2 1649/18 1650/13 1650/25 1666/8 1666/12 1666/15 1666/24 1670/17 1676/18 1778/21 1778/23 1779/7 1779/11 1779/25 1785/13 1817/23 1847/20 1857/13 1857/14 1857/16 1857/18 1861/2 1862/5</p> <p>burden [1] 1660/7</p> <p>buried [1] 1702/17</p> <p>burn [1] 1831/13</p> <p>burned [1] 1831/16</p>	<p>business [1] 1709/15</p> <p>but [174] 1629/19 1634/9 1634/14 1637/16 1637/16 1638/8 1638/16 1641/2 1644/7 1645/19 1647/16 1651/12 1651/14 1652/22 1654/8 1654/25 1655/24 1658/15 1659/16 1660/11 1660/23 1661/6 1662/17 1664/12 1667/8 1669/2 1670/11 1671/19 1673/24 1678/19 1680/15 1680/23 1681/6 1682/23 1683/16 1684/1 1684/19 1686/5 1687/6 1688/19 1690/5 1693/11 1699/25 1701/25 1702/13 1703/7 1704/5 1709/17 1719/19 1720/7 1720/11 1725/8 1727/25 1730/11 1732/5 1732/14 1732/23 1733/25 1736/2 1737/8 1737/9 1739/4 1739/10 1742/23 1742/24 1743/24 1744/6 1744/15 1744/22 1748/23 1749/5 1750/14 1751/1 1751/10 1752/6 1752/20 1753/5 1756/24 1757/15 1761/17 1762/3 1762/11 1765/14 1766/16 1769/23 1771/18 1772/15 1773/24 1774/10 1774/11 1774/22 1775/16 1775/17 1776/6 1778/6 1778/7 1778/23 1779/10 1783/5 1783/12 1784/22 1785/2 1785/11 1786/19 1787/9 1787/17 1789/2 1790/18 1793/16 1796/6 1797/15 1797/22 1798/17 1798/24 1799/7 1799/9 1800/11 1803/17 1804/3 1804/25 1806/9 1806/22 1807/3 1808/1 1808/3 1808/11 1809/3 1809/6 1812/13 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1828/17 1841/16 1854/16</p> <p>called [23] 1634/4 1663/21 1665/5 1673/23 1673/24 1705/24 1715/1 1716/20 1716/25 1716/25 1725/10 1730/8 1738/12 1738/24 1745/18 1782/6 1817/8 1827/12 1831/8 1833/14 1850/5 1850/5 1850/12</p> <p>calls [9] 1662/21 1705/21 1786/18 1787/2 1787/4 1787/9 1787/10 1787/11 1817/5</p> <p>came [40] 1629/3 1632/21 1646/18 1650/16 1664/25 1666/3 1667/10 1667/15 1672/12 1684/24 1685/7 1685/23 1692/12 1699/21 1703/12 1715/13 1725/25 1734/2 1736/19 1748/16 1750/24 1754/25 1756/13 1757/4 1777/13 1795/5 1807/6 1807/8 1813/16 1814/8 1826/13 1828/22 1834/6 1836/8 1840/15 1841/9 1847/17 1851/18 1853/16 1860/3</p>
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<p>C</p> <p>camera [16] 1648/25 1654/1 1699/24 1755/4 1755/5 1755/8 1755/8 1755/14 1755/15 1756/3 1756/4 1756/7 1756/10 1759/17 1759/19 1793/21</p> <p>cameras [1] 1755/5</p> <p>can [90] 1636/23 1637/9 1637/16 1637/16 1640/17 1647/20 1650/9 1652/19 1652/24 1652/25 1658/2 1659/24 1663/4 1663/16 1666/18 1676/5 1678/1 1679/12 1680/23 1683/5 1688/19 1696/16 1702/16 1704/2 1704/5 1708/18 1715/21 1716/6 1717/13 1719/7 1719/22 1721/8 1724/2 1735/1 1737/20 1741/8 1741/11 1742/22 1743/21 1746/11 1746/11 1746/20 1746/21 1751/20 1751/20 1752/19 1753/23 1754/11 1755/9 1757/13 1757/17 1758/3 1758/19 1759/7 1761/21 1762/2 1762/4 1762/6 1762/17 1762/19 1762/20 1764/18 1766/2 1766/2 1766/5 1766/24 1768/20 1774/19 1782/17 1789/22 1790/3 1793/21 1799/22 1800/21 1806/16 1812/5 1816/21 1819/25 1820/19 1825/23 1836/4 1836/24 1840/16 1846/5 1849/20 1853/6 1854/5 1856/7 1858/15 1862/16</p> <p>can't [13] 1664/11 1741/12 1743/24 1756/8 1762/6 1806/13 1808/8 1808/9 1822/19 1837/9 1837/21 1847/3 1847/18</p> <p>cannot [7] 1631/9 1635/1 1635/17 1638/24 1652/18 1691/18 1854/20</p> <p>capable [3] 1669/15 1701/1 1836/1</p> <p>capacity [3] 1654/8 1739/13 1739/16</p> <p>caption [1] 1654/3</p> <p>captions [1] 1784/23</p> <p>captured [1] 1846/17</p> <p>captures [1] 1784/18</p> <p>CARB [1] 1823/6</p> <p>cards [1] 1814/12</p> <p>care [3] 1630/24 1678/24 1836/2</p> <p>career [2] 1708/1 1788/21</p> <p>careful [1] 1640/1</p> <p>carefully [1] 1660/14</p> <p>Carolina [2] 1707/7 1707/20</p> <p>carrying [1] 1701/20</p> <p>case [63] 1626/7 1628/19 1632/1 1632/20 1634/9 1639/19 1641/4 1643/8 1653/8 1655/4 1655/7 1656/12 1658/1 1659/19 1660/6 1660/12 1660/13 1660/14 1660/16 1661/9 1673/1 1673/5 1679/22 1705/14 1705/18 1711/17 1712/6 1712/9 1713/3 1718/24 1727/22 1733/13 1747/11 1748/24 1752/4 1757/7 1757/14 1760/13 1760/16 1760/18 1763/24 1774/21 1775/3 1776/11 1779/14 1789/7 1790/5 1798/17 1809/20 1810/18 1811/1 1811/4 1813/2 1813/5 1813/21 1814/16 1815/5 1816/8 1847/9 1862/15 1862/23 1863/1 1863/3</p> 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[1] 1673/11</p> <p>college [3] 1819/16 1819/17 1819/19</p> <p>Collins [1] 1632/7</p> <p>color [2] 1770/4 1784/21</p> <p>Columbus [1] 1738/25</p> <p>column [1] 1850/22</p> <p>columns [2] 1690/7 1691/2</p> <p>combination [4] 1636/13 1704/22 1787/10 1791/8</p> <p>combustion [1] 1836/19</p> <p>come [31] 1633/19 1637/12 1639/19</p>
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<p>C</p> <p>come... [28] 1664/1 1664/17 1671/24 1676/7 1679/21 1700/5 1724/6 1734/21 1757/3 1757/4 1757/14 1761/12 1764/5 1808/6 1815/25 1823/22 1830/23 1831/15 1833/25 1836/24 1837/1 1837/13 1837/16 1854/1 1855/19 1859/7 1860/6 1861/23 comes [7] 1646/16 1660/18 1733/7 1747/8 1751/8 1753/1 1799/4 comfortable [3] 1657/12 1693/9 1827/25 coming [21] 1667/12 1668/8 1729/8 1730/5 1743/12 1747/1 1753/25 1811/15 1826/8 1826/22 1831/24 1832/18 1834/2 1835/18 1841/23 1847/20 1848/6 1848/17 1857/9 1859/18 1859/23 comment [11] 1643/18 1683/2 1683/24 1684/1 1684/2 1684/6 1684/7 1774/15 1787/17 1802/15 1802/15 commenting [2] 1680/6 1697/4 comments [12] 1657/23 1657/24 1658/2 1658/7 1678/21 1679/4 1680/19 1680/24 1682/16 1682/18 1682/21 1682/23 Commission [10] 1629/13 1646/3 1648/21 1658/6 1735/5 1736/15 1739/1 1805/8 1805/12 1818/7 commissions [1] 1708/7 commitment [2] 1639/23 1704/6 committed [1] 1626/16 committee [21] 1648/12 1699/10 1699/13 1836/11 1836/13 1836/14 1836/23 1837/4 1837/7 1837/13 1839/11 1842/21 1842/23 1850/6 1850/7 1850/8 1853/9 1853/10 1853/11 1853/17 1853/19 committees [1] 1850/3 common [1] 1836/22 commonly [1] 1627/12 communication [1] 1826/8 communications [2] 1817/22 1851/2 company [24] 1632/12 1638/22 1663/7 1709/14 1709/19 1709/24 1710/5 1738/24 1738/25 1773/20 1774/6 1774/13 1774/16 1775/12 1775/12 1775/22 1776/1 1776/16 1777/21 1779/24 1805/8 1809/15 1820/13 1845/20 company's [3] 1643/19 1657/9 1775/1 comparable [1] 1730/11 compare [1] 1661/12 comparison [1] 1692/18 comparisons [2] 1740/2 1740/3 complaining [1] 1664/9 complete [11] 1629/8 1629/11 1631/7 1636/11 1658/5 1710/17 1712/23 1736/16 1744/21 1835/6 1858/2 completed [12] 1714/2 1717/2 1731/8 1734/11 1734/14 1734/23 1747/18 1770/8 1790/4 1793/11 1827/16 1833/8 completely [8] 1644/16 1744/1 1793/5 1794/4 1795/23 1833/9 1837/3 1860/4 completion [2] 1687/13 1707/1 compliance [1] 1650/21 complies [1] 1636/6 comply [1] 1782/8 component [1] 1629/16 components [2] 1719/20 1719/22 computational [4] 1715/1 1724/9 1724/16 1725/15 computer [7] 1714/5 1714/22 1715/1 1716/14 1737/24 1737/25 1825/1 computers [2] 1773/6 1825/3 conceal [11] 1643/5 1645/24 1648/20 1651/15 1651/15 1651/15 1651/21 1652/3 1652/3 1656/12 1657/8 concealed [3] 1627/16 1639/24 1639/24</p>	<p>concealment [22] 1627/8 1627/20 1628/2 1633/21 1633/22 1633/24 1634/1 1634/13 1634/14 1634/14 1635/1 1635/2 1636/7 1636/20 1637/3 1637/25 1638/21 1638/24 1640/2 1653/8 1654/23 1657/25 concealments [1] 1634/20 conceded [3] 1627/21 1654/3 1654/4 concentration [2] 1769/7 1769/9 concentrations [1] 1769/17 concern [11] 1681/10 1695/20 1756/24 1813/14 1826/3 1830/3 1830/14 1832/25 1849/7 1852/22 1858/7 concerned [1] 1670/5 concerning [3] 1636/4 1670/12 1741/22 concerns [1] 1779/3 conclude [18] 1626/9 1636/16 1645/15 1647/20 1647/21 1648/8 1648/14 1652/11 1652/25 1652/25 1654/2 1655/4 1659/25 1660/20 1661/14 1709/3 1724/6 1724/10 concluded [6] 1682/9 1712/8 1733/22 1794/19 1795/5 1809/10 conclusion [13] 1635/17 1639/19 1645/21 1657/11 1715/14 1734/21 1750/4 1768/17 1778/11 1791/10 1792/7 1795/22 1815/16 conclusions [8] 1632/18 1748/12 1761/12 1771/3 1786/5 1786/6 1786/24 1804/13 concurrence [1] 1862/3 condensed [1] 1765/13 condenser [2] 1763/17 1765/13 condition [23] 1648/14 1651/16 1653/23 1653/25 1659/23 1684/13 1695/23 1729/12 1729/12 1750/10 1770/23 1782/6 1782/7 1788/6 1800/6 1822/6 1822/9 1822/17 1841/20 1841/23 1843/9 1848/6 1848/16 conditions [13] 1655/6 1724/12 1724/12 1724/21 1726/12 1728/6 1744/22 1785/18 1786/7 1786/9 1792/22 1801/15 1846/19 conductive [1] 1801/16 conduct [2] 1633/11 1711/24 conducted [1] 1644/14 conducting [1] 1712/12 confer [1] 1806/4 conference [8] 1679/14 1682/9 1748/6 1760/9 1805/20 1815/14 1817/1 1831/9 conflict [1] 1644/9 conformance [2] 1752/8 1753/12 confuse [2] 1630/4 1823/10 confused [2] 1636/24 1727/18 confusion [3] 1634/4 1634/5 1813/24 Connecticut [1] 1820/6 connection [4] 1666/19 1667/4 1667/5 1667/7 Conroy [1] 1625/5 consequence [1] 1658/6 consequences [3] 1653/2 1710/10 1804/12 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1760/20 1767/16 1772/14 1772/21 1812/21 1862/14 continued [2] 1646/23 1846/8 continuing [2] 1815/19 1858/10 contract [1] 1699/3 contracted [5] 1669/11 1700/2 1700/4 1700/13 1736/15 contracts [1] 1847/11 contradict [1] 1786/12 contrary [2] 1644/6 1644/24 control [13] 1644/14 1649/8 1649/11 1650/19 1650/22 1658/23 1720/4 1763/10 1781/14 1782/3 1782/9 1821/15 1823/24 controversy [1] 1641/4 convened [1] 1831/10 conversation [4] 1704/15 1786/16 1786/21 1788/16 conversations [2] 1834/15 1834/20 conversion [1] 1659/4 converted [1] 1673/21 converting [1] 1659/2 converts [1] 1639/8 convey [2] 1630/23 1639/21 conveyed [3] 1628/16 1629/25 1640/7 conveys [1] 1639/10 convinced [1] 1638/5 Cook [43] 1625/3 1636/22 1640/14 1640/20 1640/25 1642/8 1642/10 1642/14 1642/17 1642/23 1643/2 1643/24 1644/4 1644/7 1645/1 1645/15 1645/24 1646/5 1649/12 1649/18 1649/21 1650/3 1650/14 1650/17 1650/20 1651/7 1651/10 1657/17 1657/18 1657/23 1658/8 1658/18 1658/20 1661/11 1661/20 1661/20 1681/10 1681/13 1681/17 1681/20 1712/1 1712/15 1719/9 Cook's [1] 1658/21 cool [1] 1727/7 coolant [5] 1770/17 1770/17 1770/19 1771/24 1824/1 cooled [3] 1671/12 1671/13 1847/7 coolers [9] 1763/6 1763/7 1763/14 1763/15 1763/17 1763/19 1763/21 1786/11 1830/12 cooling [1] 1765/13 cools [3] 1725/9 1726/8 1726/8 coordinated [1] 1677/13 coordinator [1] 1707/13 copies [2] 1832/5 1833/17 copper [3] 1770/9 1770/18 1770/22 copy [5] 1686/19 1688/19 1688/22 1708/19 1834/9 core [1] 1655/21 corner [1] 1783/16 corollary [1] 1794/10 correct [133] 1632/22 1661/18 1676/14 1676/19 1676/20 1676/22 1676/23 1677/1 1678/12 1678/13 1678/24 1683/14 1683/15 1683/17 1683/18 1683/22 1684/18 1684/21 1685/17 1685/19 1686/7 1686/23 1686/25 1687/2 1687/18 1692/23 1693/1 1693/4</p>
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[24] 1764/23 1771/8 1773/19 1774/22 1782/20 1786/24 1789/1 1797/18 1798/25 1806/12 1806/13 1807/3 1812/4 1812/9 1827/9 1832/15 1851/8 1855/18 1857/22 1860/4 1860/14 1860/19 1860/19 1860/24</p> <p>door [2] 1662/7 1816/1</p> <p>doors [1] 1662/10</p> <p>dot [5] 1720/19 1720/20 1721/6 1755/25 1764/15</p> <p>dots [1] 1721/3</p> <p>doubt [8] 1626/12 1635/13 1647/21 1653/1 1659/25 1660/23 1660/25 1661/15</p> <p>down [67] 1631/24 1633/3 1634/15 1637/23 1649/25 1650/2 1652/22 1655/12 1656/13 1668/5 1669/25 1671/12 1671/13 1704/12 1715/15 1721/14 1721/15 1729/7 1732/6 1732/9 1732/10 1732/13 1732/14 1733/7 1735/20 1738/5 1738/7 1741/23 1741/24 1742/3 1742/5 1743/2 1744/19 1747/9 1751/22 1752/19 1753/6 1755/14 1756/10 1756/13 1756/14 1756/17 1758/1 1758/2 1758/15 1759/18 1759/23 1759/25 1765/23 1768/9 1768/9 1787/3 1798/25 1804/16 1815/3 1819/24 1819/25 1828/13 1833/22 1846/19 1846/24 1846/25 1847/1 1847/6 1847/7 1847/7 1856/13</p> <p>downhill [3] 1741/4 1741/5 1742/16</p> <p>Dr [2] 1708/23 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1783/10 1812/3 full [7] 1636/17 1724/17 1744/1 1812/3 1857/11 1858/2 1859/22 function [2] 1737/17 1771/9 functions [1] 1821/13 fund [1] 1853/13 fundamental [2] 1626/8 1796/9 fundamentally [1] 1626/20 funded [1] 1736/14 further [8] 1691/15 1704/3 1735/1 1752/23 1772/25 1800/13 1810/22 1855/17 furtherance [2] 1643/13 1643/14 future [6] 1671/7 1676/7 1682/25 1683/11 1683/14 1816/5 Fyfitch [2] 1856/20 1857/5 FYI [1] 1839/21
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[4] 1768/10 1768/25 1771/15 1792/8</p> <p>game [2] 1807/12 1809/4</p> <p>gap [25] 1656/6 1670/19 1671/4 1671/13 1671/17 1671/20 1689/3 1700/12 1700/14 1700/18 1700/21 1701/1 1701/2 1701/5 1701/9 1703/4 1703/8 1703/11 1703/20 1725/2 1725/3 1725/5 1755/6 1858/9 1858/11</p> <p>gaps [1] 1671/9</p> <p>gases [1] 1763/18</p> <p>gasket [2] 1751/4 1751/25</p> <p>gaskets [1] 1746/25</p> <p>gathered [1] 1684/25</p> <p>gathering [1] 1643/20</p> <p>gave [8] 1635/21 1636/4 1648/6 1670/2 1685/3 1693/8 1791/14 1813/5</p> <p>GEISEN [74] 1624/6 1624/23 1626/6 1628/8 1628/10 1628/16 1628/20 1628/25 1629/9 1630/2 1630/9 1630/22 1630/25 1633/10 1634/23 1635/9 1635/14 1636/21 1638/10 1638/16 1638/22 1639/2 1639/20 1642/6 1646/17 1647/4 1647/22 1648/8 1648/12 1648/14 1649/6 1649/9 1651/6 1652/22 1653/4 1653/6 1654/3 1654/11 1654/13 1654/15 1657/5 1659/3 1659/5 1661/11 1667/4 1672/18 1674/18 1675/5 1679/19 1680/22 1681/5 1681/5 1681/7 1689/24 1692/22 1693/12 1693/12 1694/22 1695/10 1695/18 1704/17 1704/24 1705/7 1711/25 1712/15 1816/20 1817/6 1817/7 1817/12 1817/16 1817/17 1840/1 1842/15 1862/14</p> <p>Geisen's [6] 1628/24 1630/11 1635/13 1674/21 1675/6 1811/24</p> <p>general [5] 1671/2 1758/20 1759/9 1836/20 1837/8</p> <p>generalizations [1] 1781/18</p> <p>generally [1] 1633/18</p> <p>generated [2] 1826/18 1840/17</p> <p>generator [2] 1720/2 1720/20</p> <p>generators [1] 1719/19</p> <p>gentleman [1] 1667/17</p> <p>gentlemen [16] 1662/5 1662/15 1705/8 1705/12 1706/23 1711/12 1713/18 1741/21 1747/16 1751/12 1760/3 1760/11 1764/13 1773/8 1810/23 1862/11</p> <p>geometric [1] 1795/8</p> <p>geometry [3] 1716/17 1743/7 1744/4</p> <p>Georgia [2] 1707/8 1707/20</p> <p>get [56] 1630/16 1636/23 1651/2 1652/18 1654/1 1654/7 1655/22 1658/14 1659/16 1664/13 1668/2 1668/7 1688/4 1688/19 1721/21 1728/18 1737/6 1738/11 1739/6 1742/20 1752/11 1753/20 1755/14 1756/10 1757/1 1758/13 1758/16 1761/22 1771/25 1795/7 1797/20 1797/25 1802/24 1808/7 1813/21 1814/20 1814/22 1815/2 1815/2 1816/6 1816/21 1819/14 1823/3 1824/24 1830/20 1835/6 1836/17 1837/3 1848/25 1853/13 1855/17 1859/17 1859/24 1860/14 1860/19 1860/24</p> <p>gets [12] 1651/1 1651/13 1654/19 1657/1 1726/6 1726/9 1727/6 1732/8 1733/2 1733/4 1733/5 1753/21</p> <p>getting [23] 1649/13 1655/20 1655/23 1664/18 1666/4 1672/14 1673/20 1756/3 1756/4 1756/7 1756/20 1805/24 1808/20 1809/4 1821/15 1826/12 1826/19 1826/24 1831/16 1834/22 1840/20 1856/6 1860/19</p> <p>Gibb's [1] 1651/3</p> <p>Gibbs [17] 1667/18 1667/19 1667/20</p>	<p>1667/21 1667/22 1668/4 1668/5 1669/23 1685/15 1685/20 1685/21 1687/11 1687/21 1687/23 1834/8 1834/13 1834/21</p> <p>Gibbs' [2] 1686/20 1687/1</p> <p>give [5] 1635/18 1668/1 1671/24 1774/19 1793/15</p> <p>given [5] 1637/19 1700/2 1801/11 1813/10 1859/4</p> <p>gives [4] 1696/22 1719/19 1752/4 1753/14</p> <p>giving [6] 1636/17 1652/13 1665/7 1689/16 1713/2 1717/12</p> <p>glass [1] 1661/13</p> <p>Glenn [2] 1829/19 1859/20</p> <p>go [51] 1637/3 1637/5 1637/16 1660/7 1661/17 1669/12 1672/4 1674/2 1674/12 1681/24 1692/11 1692/18 1693/23 1702/16 1721/10 1721/18 1721/23 1727/12 1738/6 1742/1 1742/16 1743/25 1752/18 1752/22 1768/8 1778/1 1783/15 1785/11 1793/15 1799/1 1810/8 1811/16 1812/21 1814/10 1827/16 1830/16 1830/17 1836/25 1838/7 1840/21 1841/3 1842/15 1843/5 1847/2 1847/10 1848/25 1853/19 1856/13 1857/22 1860/5 1861/24</p> <p>goal [3] 1700/9 1821/14 1837/5</p> <p>goes [11] 1650/25 1651/2 1651/6 1656/9 1681/18 1733/2 1739/14 1739/15 1753/4 1788/22 1827/11</p> <p>going [70] 1647/19 1647/23 1648/13 1650/19 1652/11 1656/18 1658/14 1662/6 1664/14 1669/15 1682/2 1682/2 1684/2 1684/3 1690/17 1695/21 1701/16 1705/12 1708/13 1716/3 1729/4 1729/8 1729/8 1729/17 1730/21 1745/25 1748/10 1749/2 1751/7 1752/11 1752/13 1752/23 1753/1 1754/21 1755/21 1757/14 1757/15 1757/16 1757/22 1757/25 1780/1 1781/21 1781/24 1785/23 1791/15 1796/5 1811/16 1812/16 1814/6 1814/14 1819/24 1821/19 1821/23 1824/1 1828/4 1829/5 1830/6 1831/7 1835/4 1835/22 1835/23 1836/25 1838/16 1839/22 1842/15 1847/14 1847/19 1848/4 1848/25 1856/8</p> <p>gold [3] 1723/14 1723/14 1723/15</p> <p>gone [5] 1629/4 1646/16 1674/6 1820/15 1832/23</p> <p>good [32] 1626/2 1626/4 1638/7 1646/9 1646/15 1662/5 1663/1 1675/14 1675/15 1676/4 1704/11 1706/3 1706/4 1719/8 1752/5 1755/25 1772/19 1773/7 1773/15 1773/16 1781/11 1782/24 1787/22 1789/25 1817/12 1817/13 1826/14 1857/22 1860/6 1862/9 1862/18 1862/21</p> <p>Gordon [4] 1625/4 1625/4 1646/7 1657/17</p> <p>got [34] 1643/21 1650/2 1651/12 1654/13 1669/23 1675/25 1676/9 1690/6 1713/21 1723/20 1755/11 1778/14 1786/5 1806/5 1806/12 1808/1 1814/5 1819/9 1819/11 1819/15 1819/22 1824/4 1826/21 1826/21 1827/15 1828/17 1829/1 1833/3 1833/4 1833/17 1836/22 1839/14 1845/3 1857/3</p> <p>gotten [2] 1832/14 1862/8</p> <p>government [40] 1626/14 1627/17 1627/21 1633/24 1634/3 1636/23 1638/23 1639/14 1641/17 1642/2 1643/16 1643/23 1644/11 1644/25 1648/19 1651/19 1651/21 1652/2 1654/22 1655/2 1656/14 1660/7 1661/4 1679/19 1681/13 1690/10 1697/20 1748/1 1749/16 1811/12 1811/22 1812/7 1812/20 1814/5 1814/15 1815/9 1839/24 1842/10 1846/11 1852/24</p> <p>government's [32] 1626/7 1628/19 1633/20 1639/23 1640/3 1640/16 1644/9 1644/15 1645/22 1645/23 1682/12 1682/14</p>	<p>1688/21 1730/15 1740/16 1741/13 1745/8 1748/1 1749/17 1760/25 1761/4 1779/20 1781/10 1811/9 1812/1 1816/8 1838/17 1843/14 1845/19 1849/10 1851/25 1856/19</p> <p>Goyal [40] 1628/7 1634/22 1643/12 1644/18 1648/1 1648/6 1649/15 1649/17 1650/20 1653/5 1658/20 1822/5 1829/10 1838/19 1839/17 1840/5 1840/7 1841/12 1842/15 1842/25 1843/3 1843/15 1843/24 1844/19 1845/21 1846/12 1848/15 1848/19 1849/3 1849/11 1849/12 1852/1 1852/3 1852/24 1854/1 1855/19 1856/19 1857/4 1857/21 1858/22</p> <p>Goyal's [4] 1644/5 1838/21 1845/21 1853/1</p> <p>graduate [3] 1707/1 1707/14 1819/17</p> <p>graduated [1] 1819/19</p> <p>graduation [1] 1819/15</p> <p>grandpa [1] 1743/23</p> <p>granted [1] 1711/13</p> <p>graph [1] 1766/8</p> <p>graphic [2] 1733/12 1742/8</p> <p>graphically [1] 1718/22</p> <p>great [5] 1681/5 1720/14 1720/15 1747/23 1840/22</p> <p>greater [6] 1639/4 1753/21 1794/20 1800/24 1800/25 1803/7</p> <p>Green [1] 1818/17</p> <p>greensheet [6] 1634/25 1650/17 1861/15 1861/18 1861/19 1861/22</p> <p>greensheets [2] 1648/15 1861/23</p> <p>Greg [9] 1651/3 1667/19 1667/20 1667/21 1667/22 1667/24 1668/1 1668/8 1825/2</p> <p>Gregory [1] 1667/18</p> <p>grew [2] 1715/15 1803/5</p> <p>grid [3] 1724/19 1724/20 1724/25</p> <p>grinding [1] 1799/25</p> <p>groove [39] 1713/23 1714/7 1714/17 1715/13 1715/15 1715/15 1715/25 1717/13 1717/17 1717/25 1718/5 1718/12 1722/12 1723/3 1727/25 1732/15 1732/19 1732/22 1734/5 1735/21 1737/22 1738/9 1739/2 1739/4 1740/6 1741/2 1741/3 1741/3 1742/2 1742/3 1747/9 1747/20 1751/18 1751/22 1771/11 1791/4 1796/15 1796/18 1796/21</p> <p>grooves [9] 1746/25 1751/4 1751/19 1751/21 1751/21 1752/2 1752/3 1752/24 1753/9</p> <p>grounds [2] 1627/23 1813/8</p> <p>group [38] 1663/21 1663/25 1678/10 1709/22 1820/22 1820/23 1823/25 1824/16 1824/20 1825/1 1825/4 1826/4 1826/9 1826/10 1827/17 1835/5 1835/10 1835/14 1836/15 1836/15 1836/16 1836/17 1836/18 1836/19 1836/19 1836/20 1836/21 1837/11 1839/23 1841/4 1841/7 1842/9 1845/9 1850/4 1859/5 1859/8 1859/17 1860/7</p> <p>groups [5] 1663/22 1824/15 1825/21 1826/22 1831/10</p> <p>grow [1] 1772/21</p> <p>growing [1] 1714/13</p> <p>grown [4] 1718/4 1723/6 1723/22 1723/23</p> <p>grows [2] 1725/10 1761/19</p> <p>growth [16] 1714/9 1714/15 1715/8 1727/1 1733/8 1735/16 1736/5 1737/8 1737/16 1768/19 1768/21 1771/7 1785/21 1802/16 1835/12 1845/4</p> <p>guarantee [1] 1814/5</p> <p>guaranty [1] 1681/18</p> <p>guess [14] 1663/21 1670/1 1678/10 1700/12 1704/8 1753/10 1756/14 1770/4 1784/3 1802/18 1816/18 1832/15 1839/14 1853/8</p>
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<p>H</p> <p>his... [52] 1640/7 1640/22 1643/6 1647/8 1647/16 1650/15 1650/22 1651/3 1653/15 1655/11 1657/18 1662/2 1674/9 1679/18 1680/9 1680/11 1680/14 1680/17 1681/1 1681/22 1681/24 1688/9 1691/20 1692/4 1694/20 1695/15 1697/23 1698/1 1698/1 1780/25 1782/8 1789/14 1793/11 1806/22 1806/24 1807/12 1808/4 1808/5 1811/24 1816/2 1816/4 1816/4 1816/6 1816/16 1819/10 1822/6 1831/17 1839/23 1851/16 1852/6 1859/21 1859/24</p> <p>Hiser [1] 1638/3</p> <p>Hiser's [1] 1647/16</p> <p>history [8] 1697/13 1706/24 1710/4 1769/21 1823/4 1830/25 1832/21 1838/11</p> <p>hit [1] 1644/1</p> <p>hitting [1] 1767/12</p> <p>Hizer [2] 1655/10 1655/19</p> <p>hold [3] 1662/7 1707/16 1766/1</p> <p>hole [16] 1731/4 1731/7 1733/3 1738/6 1740/17 1745/7 1745/13 1745/18 1777/19 1785/17 1785/19 1803/8 1803/14 1803/25 1804/3 1804/17</p> <p>holes [25] 1649/16 1651/5 1654/1 1658/12 1658/14 1658/16 1668/12 1668/14 1668/19 1668/25 1669/13 1688/2 1700/5 1716/25 1716/25 1721/15 1721/17 1725/8 1788/9 1803/5 1803/18 1831/25 1854/21 1855/12 1855/15</p> <p>HollyRock [1] 1820/6</p> <p>Holmberg [1] 1650/11</p> <p>homogenous [1] 1797/4</p> <p>honest [3] 1743/4 1797/17 1833/17</p> <p>Honor [76] 1626/2 1626/3 1626/5 1627/1 1629/7 1630/3 1631/25 1633/9 1636/2 1637/22 1640/9 1641/2 1646/6 1646/9 1646/12 1660/4 1661/17 1661/24 1662/21 1662/22 1675/10 1677/24 1678/4 1679/8 1679/12 1680/4 1681/3 1681/9 1681/16 1686/12 1687/8 1690/15 1691/18 1695/7 1695/15 1696/3 1697/22 1702/18 1703/16 1704/2 1704/3 1704/5 1705/21 1708/22 1709/3 1711/8 1711/11 1719/1 1719/4 1719/10 1720/16 1727/14 1748/3 1748/8 1749/4 1754/17 1759/3 1760/22 1766/19 1766/22 1773/3 1773/5 1773/11 1779/19 1780/21 1781/8 1793/10 1805/18 1805/23 1806/18 1812/9 1813/5 1814/2 1816/24 1817/5 1862/20</p> <p>HONORABLE [1] 1624/9</p> <p>Hope [1] 1662/18</p> <p>hopefully [2] 1640/19 1751/13</p> <p>hoping [1] 1826/9</p> <p>hose [1] 1743/24</p> <p>hot [5] 1664/12 1830/21 1842/1 1848/8 1856/5</p> <p>hour [4] 1730/2 1760/12 1816/21 1831/14</p> <p>hours [2] 1663/24 1790/6</p> <p>House [1] 1836/18</p> <p>Houston [1] 1659/10</p> <p>hovered [1] 1792/8</p> <p>how [75] 1637/6 1637/8 1640/24 1652/20 1663/11 1667/15 1671/15 1676/2 1676/4 1677/12 1684/24 1685/12 1685/22 1698/23 1714/11 1714/19 1714/24 1715/5 1718/17 1724/6 1724/22 1724/22 1725/25 1731/7 1734/21 1735/15 1738/8 1738/15 1738/21 1744/8 1755/2 1755/10 1757/1 1758/7 1758/13 1758/15 1761/12 1761/16 1773/17 1773/20 1774/1 1775/5 1784/2 1786/4 1803/4 1806/15 1806/25 1808/10 1809/22 1815/8 1818/13 1818/18 1819/4 1820/2</p>	<p>1821/13 1821/17 1825/8 1825/18 1825/24 1827/20 1828/2 1829/1 1830/18 1834/6 1838/5 1839/14 1854/6 1855/4 1855/19 1855/23 1855/24 1855/25 1858/15 1858/18 1860/6</p> <p>however [1] 1800/1</p> <p>huh [1] 1719/25</p> <p>humorous [1] 1664/7</p> <p>Hyatt [2] 1710/1 1774/23</p> <p>hydro [1] 1800/2</p> <p>hypothetically [1] 1671/18</p> <p>I</p> <p>I'd [18] 1646/12 1651/18 1652/1 1654/18 1660/4 1662/10 1670/1 1679/5 1690/9 1760/24 1782/22 1784/8 1784/13 1787/20 1837/1 1837/2 1837/2 1838/7</p> <p>I'll [22] 1633/17 1634/10 1640/23 1642/25 1678/5 1684/14 1686/16 1691/22 1696/3 1743/15 1746/15 1749/10 1749/12 1753/4 1783/10 1786/19 1794/1 1812/12 1812/20 1812/20 1823/10 1839/24</p> <p>I'm [94] 1637/11 1647/1 1654/24 1658/14 1659/15 1667/7 1676/1 1676/5 1679/4 1680/15 1682/1 1682/2 1684/2 1684/3 1687/8 1690/1 1690/17 1690/19 1694/21 1697/22 1704/9 1704/10 1707/20 1707/22 1707/24 1708/13 1711/13 1716/3 1720/10 1721/8 1727/4 1730/21 1742/3 1748/15 1749/2 1751/7 1752/12 1753/3 1754/21 1755/21 1756/19 1756/20 1757/11 1757/23 1758/15 1761/17 1766/4 1766/22 1767/12 1767/12 1767/22 1774/8 1775/2 1777/25 1778/5 1780/1 1781/21 1781/24 1788/4 1790/23 1791/15 1793/12 1793/14 1797/24 1800/9 1801/19 1806/19 1808/6 1809/3 1812/11 1816/18 1819/24 1823/8 1824/3 1825/12 1833/12 1834/23 1838/16 1840/15 1842/3 1844/12 1845/19 1846/23 1848/4 1849/19 1849/23 1849/24 1853/20 1854/17 1855/15 1857/2 1857/15 1862/8</p> <p>I've [17] 1639/17 1660/3 1660/14 1697/12 1711/13 1733/11 1773/19 1783/5 1784/23 1790/6 1790/7 1806/5 1819/9 1819/11 1823/25 1833/17 1858/23</p> <p>I-600 [1] 1699/9</p> <p>IC [1] 1824/20</p> <p>idea [7] 1657/2 1697/10 1712/4 1811/23 1812/17 1853/16 1856/5</p> <p>identical [1] 1796/24</p> <p>identified [19] 1713/23 1714/8 1723/8 1729/10 1735/7 1738/19 1744/14 1748/18 1750/10 1751/16 1754/4 1770/8 1770/9 1794/13 1795/3 1835/8 1835/8 1835/9 1860/23</p> <p>identifies [1] 1647/15</p> <p>identify [15] 1633/25 1708/18 1712/24 1716/6 1722/4 1726/1 1733/9 1737/16 1739/8 1754/11 1758/19 1759/8 1766/5 1771/10 1804/24</p> <p>identifying [1] 1826/23</p> <p>idiots [1] 1808/9</p> <p>if [179] 1628/1 1632/9 1633/20 1635/11 1635/20 1636/24 1637/10 1638/6 1639/12 1641/12 1641/14 1641/23 1642/8 1642/21 1644/9 1645/21 1645/21 1651/11 1655/15 1655/16 1656/13 1657/9 1658/2 1660/20 1662/10 1663/22 1664/17 1666/5 1667/25 1670/9 1670/20 1671/4 1671/9 1671/10 1671/15 1671/17 1672/5 1672/6 1673/3 1673/3 1674/8 1681/18 1683/5 1686/8 1687/25 1690/19 1690/24 1691/9 1692/9 1692/13 1697/23 1700/21 1700/25 1701/2 1701/5 1702/2 1703/4 1703/20 1703/24</p>	<p>1705/24 1709/23 1710/15 1710/23 1714/4 1714/20 1715/5 1715/21 1716/12 1719/7 1719/24 1720/12 1720/13 1720/13 1720/19 1720/22 1723/7 1723/13 1724/1 1724/23 1725/20 1725/21 1725/21 1726/3 1727/5 1728/6 1731/15 1731/17 1731/24 1733/1 1735/22 1736/4 1737/2 1737/20 1741/8 1741/20 1741/24 1741/25 1742/1 1742/4 1742/5 1742/13 1742/21 1743/19 1745/4 1745/23 1746/20 1748/13 1751/25 1752/5 1752/15 1752/16 1752/21 1753/11 1755/10 1756/12 1756/24 1756/25 1758/14 1762/7 1768/20 1768/25 1769/11 1769/14 1773/8 1774/20 1775/2 1776/21 1776/24 1777/19 1777/19 1778/2 1778/2 1778/4 1778/14 1783/10 1784/8 1789/18 1791/1 1791/11 1792/11 1792/25 1793/1 1793/25 1794/24 1796/6 1797/22 1798/24 1800/9 1804/16 1806/14 1807/1 1807/10 1808/18 1808/25 1809/7 1813/9 1813/15 1814/12 1814/12 1814/24 1814/25 1815/11 1815/21 1817/8 1828/22 1835/18 1840/23 1841/4 1846/18 1846/21 1846/23 1848/25 1849/7 1853/15 1853/18 1854/11 1861/19 1862/10 1862/12</p> <p>ignorance [1] 1629/24</p> <p>ignoring [1] 1629/20</p> <p>II [1] 1730/2</p> <p>III [1] 1730/12</p> <p>Illinois [1] 1707/20</p> <p>image [20] 1716/18 1717/12 1721/14 1721/19 1722/10 1723/7 1723/9 1723/10 1723/13 1724/2 1724/4 1724/6 1730/25 1731/20 1731/21 1746/20 1749/22 1750/12 1750/13 1751/9</p> <p>images [5] 1716/15 1750/11 1753/20 1761/23 1762/13</p> <p>immediately [1] 1628/13</p> <p>immunity [2] 1812/11 1813/6</p> <p>impact [3] 1746/4 1751/15 1838/5</p> <p>impacting [1] 1655/9</p> <p>imparted [1] 1635/16</p> <p>imparting [1] 1630/13</p> <p>impeach [1] 1806/9</p> <p>impeachment [1] 1806/8</p> <p>impediment [6] 1649/17 1649/20 1649/21 1658/13 1658/16 1658/17</p> <p>impingement [2] 1745/5 1746/4</p> <p>implement [1] 1827/21</p> <p>implemented [2] 1826/25 1827/2</p> <p>implicate [1] 1681/1</p> <p>implication [1] 1681/4</p> <p>implies [1] 1850/18</p> <p>Impo [6] 1859/15 1859/16 1859/18 1859/22 1860/3 1860/11</p> <p>importance [1] 1629/14</p> <p>important [12] 1627/2 1639/14 1641/3 1645/3 1652/21 1683/21 1685/24 1728/2 1740/25 1774/16 1776/17 1830/20</p> <p>importantly [1] 1751/5</p> <p>impossible [1] 1794/8</p> <p>impressed [1] 1704/11</p> <p>impression [1] 1841/25</p> <p>impressive [1] 1773/20</p> <p>improper [1] 1679/24</p> <p>improvement [4] 1859/10 1859/14 1860/1 1860/5</p> <p>imputed [1] 1629/17</p> <p>in [867]</p> <p>in-depth [1] 1832/13</p> <p>inaccurate [1] 1785/14</p> <p>inadequacy [1] 1656/21</p> <p>inappropriate [1] 1781/1</p> <p>inch [8] 1668/23 1739/19 1745/15 1745/16 1745/17 1768/22 1771/13 1803/7</p>
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<p> inches [2] 1772/20 1772/21 incident [2] 1734/6 1801/5 Incidentally [2] 1696/6 1697/7 include [1] 1652/6 included [6] 1689/7 1701/12 1750/24 1765/6 1765/7 1770/4 includes [2] 1653/20 1737/11 including [1] 1816/4 incomplete [1] 1728/11 inconel [2] 1797/15 1802/3 inconsistent [2] 1800/14 1801/10 incorporated [2] 1744/12 1745/21 incorrect [9] 1628/12 1628/15 1629/1 1630/14 1630/17 1639/8 1640/6 1694/19 1784/6 incorrectness [1] 1627/19 increase [4] 1715/17 1718/14 1728/5 1750/14 increased [9] 1715/16 1727/23 1765/8 1765/16 1767/20 1767/23 1768/17 1769/25 1772/7 increases [1] 1726/6 increasing [1] 1768/5 indeed [2] 1643/5 1655/10 indicate [3] 1653/22 1677/14 1695/22 indicated [14] 1654/12 1654/12 1657/17 1661/25 1678/8 1680/8 1680/17 1696/10 1696/17 1780/3 1811/15 1812/25 1815/16 1854/17 indicating [3] 1658/15 1659/3 1720/6 indication [3] 1742/17 1752/4 1752/22 indications [1] 1746/3 indictment [12] 1626/19 1631/23 1633/6 1633/10 1633/15 1633/25 1634/17 1638/10 1640/15 1644/12 1654/20 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[26] 1693/25 1696/7 1696/12 1698/5 1698/8 1698/18 1698/22 1700/8 1700/14 1700/19 1701/1 1701/13 1702/1 1702/8 1702/16 1703/8 1703/23 1776/7 1776/13 1776/17 1784/1 1794/22 1796/12 1801/10 1803/22 1803/24</p> <p>issue [27] 1631/4 1633/18 1641/9 1642/3 1644/2 1646/18 1654/7 1654/17 1654/18 1654/18 1655/19 1655/21 1656/9 1657/24 1670/14 1692/10 1694/6 1701/21 1735/25 1812/25 1813/1 1814/3 1814/3 1815/19 1834/20 1844/13 1844/23</p> <p>issued [6] 1666/8 1776/22 1826/12 1860/21 1860/25 1861/2</p> <p>issues [23] 1651/8 1661/10 1705/17 1710/22 1743/7 1760/17 1777/8 1811/3 1814/19 1826/2 1826/8 1826/11 1828/7 1828/11 1836/5 1836/21 1837/7 1838/5 1844/19 1844/22 1859/12 1860/5 1863/2</p> <p>it [580]</p> <p>it that [1] 1676/18</p> <p>it's [109] 1627/23 1629/16 1630/8 1630/8 1630/17 1631/14 1633/21 1638/1 1645/8 1646/14 1651/21 1655/1 1657/2 1662/9 1664/7 1671/15 1677/23 1678/24 1681/18 1686/14 1686/24 1690/5 1690/6 1691/20 1701/16 1702/15 1702/15 1704/11 1719/21 1721/7 1723/15 1724/18 1725/5 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<p>John [1] 1625/5</p> <p>join [2] 1640/20 1820/17</p> <p>joined [3] 1775/12 1820/11 1820/21</p> <p>joining [1] 1645/20</p> <p>judge [14] 1624/10 1641/10 1679/16 1681/8 1681/21 1691/21 1695/5 1695/24 1806/5 1806/20 1811/11 1812/6 1828/10 1862/8</p> <p>judges [3] 1660/18 1660/23 1779/14</p> <p>judgment [6] 1626/6 1640/10 1660/5 1660/12 1757/3 1778/24</p> <p>judgments [1] 1644/21</p> <p>July [7] 1849/18 1850/24 1851/11 1851/23 1852/3 1852/15 1860/2</p> <p>July 10th [1] 1851/11</p> <p>July 12th [1] 1852/3</p> <p>jump [3] 1752/13 1813/9 1814/24</p> <p>jumped [2] 1828/9 1855/10</p> <p>junction [2] 1661/7 1749/12</p> <p>June [8] 1694/12 1694/13 1697/17 1845/20 1847/13 1848/5 1848/16 1852/10</p> <p>June 13th [1] 1852/10</p> <p>June 20th [1] 1694/13</p> <p>June 27th [1] 1845/20</p> <p>junior [1] 1819/21</p> <p>junk [1] 1746/9</p> <p>juror [1] 1813/9</p> <p>jury [87] 1624/6 1624/9 1627/25 1635/18 1637/12 1639/13 1639/15 1639/18 1641/2 1646/15 1647/20 1647/21 1648/7 1648/13 1648/21 1649/9 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1756/21 1757/6 1764/8 1783/25 1784/6 1788/4 1793/21 1794/1 1795/1 1801/11 1801/17 1808/22 1809/12 1813/12 1816/13 1818/16 1818/19 1819/24 1822/21 1825/8 1827/8 1827/14 1830/6 1832/9 1834/11 1838/2 1839/5 1839/21 1839/22 1843/2 1844/6 1844/7 1844/24 1850/16 1853/20 1855/15 1855/16 1856/4 1858/10 1858/13 1858/23</p> <p>Justice [2] 1624/17 1749/24</p> <p>justification [2] 1646/23 1846/8</p> <p>justify [1] 1632/12</p>	<p>K</p> <p>Kansas [1] 1710/1</p> <p>Kathleen [1] 1819/1</p> <p>Kathy [1] 1819/14</p> <p>KATZ [1] 1624/9</p> <p>keep [13] 1652/12 1653/1 1656/13 1656/18 1657/8 1660/18 1701/7 1709/9 1732/18 1808/8 1815/24 1859/12 1862/15</p> <p>keeping [6] 1653/11 1654/5 1662/16 1758/9 1759/23 1761/5</p> <p>Ken [1] 1835/12</p> <p>kept [1] 1656/22</p> <p>key [4] 1629/16 1630/3 1669/13 1723/2</p> <p>kicked [1] 1829/7</p> <p>kids [2] 1819/2 1819/5</p> <p>kind [27] 1655/24 1664/7 1664/11 1674/10 1691/3 1691/3 1715/6 1716/12 1717/16 1720/21 1729/22 1743/1 1753/4 1754/8 1764/12 1767/4 1768/10 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1833/3</p> <p>knowingly [4] 1630/18 1639/9 1639/21 1776/25</p> <p>knowledge [33] 1627/5 1627/12 1628/25 1629/2 1629/9 1629/17 1629/20 1636/4 1636/19 1639/8 1645/7 1646/13 1649/8 1650/24 1651/1 1651/13 1654/11 1654/13 1660/1 1660/2 1673/3 1698/1 1698/15 1712/14 1731/6 1748/25 1762/1 1774/8 1776/19 1781/4 1782/19 1789/13 1812/24</p> <p>knowledgeable [3] 1646/18 1806/13 1807/11</p> <p>known [9] 1645/5 1648/8 1657/15 1667/22 1702/7 1708/20 1762/18 1820/13 1839/10</p> <p>knows [1] 1807/22</p> <p>L</p> <p>labeled [1] 1846/13</p> <p>laboratory [11] 1707/2 1707/5 1707/15 1714/3 1714/10 1714/23 1726/19 1736/11 1736/13 1736/14 1771/8</p> <p>lack [2] 1629/11 1664/2</p> <p>ladies [15] 1662/5 1662/15 1705/12 1706/23 1711/12 1713/17 1741/20 1747/16 1751/12 1760/3 1760/11 1764/12 1773/8 1810/23 1862/11</p> <p>lady [1] 1662/7</p>
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<p>Q</p> <p>question... [28] 1679/21 1680/9 1681/21 1691/10 1691/11 1691/15 1692/4 1695/13 1696/16 1697/16 1697/18 1703/17 1713/12 1735/16 1736/1 1750/21 1772/10 1779/1 1779/23 1784/3 1784/10 1789/18 1789/23 1807/17 1807/19 1846/17 1847/8 1858/5</p> <p>question's [1] 1695/13</p> <p>questioned [4] 1680/1 1691/12 1691/12 1692/21</p> <p>questioning [3] 1680/20 1690/23 1748/4</p> <p>questions [23] 1646/22 1650/7 1650/10 1651/8 1656/17 1656/19 1657/24 1658/3 1660/9 1675/25 1681/7 1692/4 1700/12 1702/25 1704/3 1704/12 1772/25 1791/16 1805/24 1809/12 1810/1 1810/22 1815/12</p> <p>quick [4] 1663/21 1730/3 1796/5 1834/9</p> <p>quickly [5] 1637/10 1637/24 1646/13 1671/24 1777/17</p> <p>quite [8] 1638/4 1638/19 1704/11 1723/16 1756/8 1802/1 1802/2 1834/10</p> <p>quote [4] 1631/15 1632/11 1658/14 1808/2</p>	<p>readiness [1] 1833/12</p> <p>reading [10] 1632/6 1633/9 1833/19 1833/21 1833/24 1834/8 1834/11 1852/17 1854/24 1857/6</p> <p>reads [2] 1631/23 1854/20</p> <p>ready [15] 1626/1 1662/12 1662/20 1666/4 1773/11 1816/17 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