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UNITED STATES NUCLEAR REGULATORY COMMISSION'S
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

March 2, 2005

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This transcript has not been reviewed, corrected and edited and it may contain inaccuracies.

1 UNITED STATES OF AMERICA
2 NUCLEAR REGULATORY COMMISSION

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4 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

5 (ACRS)

6 MEETING OF THE AD HOC SUBCOMMITTEE

7 ON EARLY SITE PERMITS

8 +++++

9 WEDNESDAY

10 MARCH 2, 2005

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12 ROCKVILLE, MARYLAND

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14 The Committee met at the Nuclear Regulatory
15 Commission, Two White Flint North, Room T2B3, 11545
16 Rockville Pike, at 1:00 p.m., Dana A. Powers,
17 Chairman, presiding.

18 COMMITTEE MEMBERS:

19 DANA A. POWERS, Chairman

20 GEORGE A. APOSTOLAKIS, Member

21 MARIO V. BONACA, Member

22 THOMAS S. KRESS, Member

23 WILLIAM J. SHACK, Member

24 JOHN D. SIEBER, Member

25 GRAHAM B. WALLIS, Member

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ACRS STAFF PRESENT:

MEDHAT EL-ZEFTAWY

NRC STAFF PRESENT:

LAURA DUDES, NRR/DRIP/RNRP

MICHAEL SCOTT, NRR/DRIP/RNRP

BELKYS SOSA, NRR/DRI/RNRP

BRAD HARVEY, NRR/DSSA/SPSB-C

BROOKE POOLE, NRC/OGC

KAZ CAMPE, NRR/DSSA/SPSB

CLIFF MUNSON, NRR/DE/EMEB

GOUTAM BAGCHI, NRR/DE/EMEB

PAUL PRESCOTT, NRR/DIPM/IPSB

JOHN SEGAK, NRR/DRIP/RNRP

JAY LEE, NRR/DSSA/SPSB

ROBERT WEISMAN, OGC/RP

DAN BARSS, NSIR/DPR/EPD

KEN HECK, NRR

DALE THATK, NRR/DIPM/IPSB

BRUCE MUSICO

1 ALSO PRESENT:

2 RICHARD BAKER, Bechtel Power Corporation

3 MIKE SCHOPPMAN, FRAMATOME, ANP

4 TOMOHO YAMADA, JNES

5 CHARLES MUELLER, U.S. Geological Survey

6 ANTHONY J. CRONE, U.S. Geological Survey

7 STEVE ROTH, Bechtel Power Corporation

8 GEORGE ZINKE, Entergy/NUSTART

9 EDDIE R. GRANT, Exelon

10 JOE HEGNER, Dominion

11 BRENDAN HOFFMAN, Public Citizen

12 EUGENE GRECHECK, Dominion

13 MARVIN SMITH, Dominion

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P R O C E E D I N G S

1
2 DR. POWERS: The meeting will now come to
3 order.

4 This is a meeting of the ACRS Subcommittee
5 on Early Site Permits, and in some incarnations it's
6 been called an ad hoc subcommittee. The members may
7 be ad hoc, but there's nothing ad hoc about the
8 subcommittee.

9 I'm Dana Powers, chairman of the
10 subcommittee. Other ACRS members in attendance
11 include George Apostolakis, Mario Bonaca, Thomas
12 Kress, William Shack, Graham Wallis. Jack Sieber will
13 join us as his busy meeting schedule allows.

14 For today's meeting the subcommittee will
15 review and discuss the NRC Staff's draft safety
16 evaluation report regarding the North Anna early site
17 permit and the applicant's submittals for this early
18 site permit.

19 As you are aware, subcommittees gather
20 information, analyze relevant facts and issues, and
21 formulate proposed positions and actions for
22 deliberation by the full committee.

23 Dr. Medhat El-Zeftaway is the cognizant
24 ACRS staff engineer for this meeting, and actually
25 knows what we're doing.

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1 The rules for participation in today's
2 meeting have been announced as part of the notice of
3 this meeting previously published in the Federal
4 Register on February the 15th, 2005. A transcript of
5 this meeting is being kept by K.C., and you will be
6 kind to K.C. because she is new here, and this is her
7 first exposure to a litany of geological terms that
8 surpasseth all human understanding. So a certain
9 amount of kindness will be appreciated.

10 This transcript will be made available as
11 stated in the Federal Register Notice.

12 It is a requirement of this committee that
13 all speakers first identify themselves and speak with
14 sufficient clarity and volume so they are readily
15 heard. Should you not do this, you will be called
16 "and I" or "I just want to" or "hey, you funny
17 looking."

18 We have received no written comments or
19 requests for time to make oral statements from members
20 of the public.

21 At this point I am supposed to make some
22 comments, and my first comment is that the technology
23 available for reading a 2,000-page document off a
24 computer screen is truly abysmal. I asked my staff if
25 there was anything better, and sure enough, they came

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1 up with something that was fantastically better, but
2 does not work on PDF documents.

3 So clearly there is some progress in
4 computer science to be made.

5 Other than that, I have no opening
6 comments.

7 Do any of the members have any opening
8 comments?

9 Seeing none of those, I think we're going
10 to turn to Mr. Gene Grecheck, who is the vice
11 president of Dominion, who is going to give us an
12 introduction to this massive tome of geological
13 insights that surpasseth all human understanding.

14 MR. GRECHECK: Well, with that, I'm not
15 sure how I can --

16 (Laughter.)

17 MR. GRECHECK: But thank you, Dr. Powers.

18 Again, I am Gene Grecheck, vice president
19 of nuclear support services for Dominion, and it is
20 our pleasure to be here at this -- one of many
21 milestones for --

22 DR. POWERS: Now that's the first
23 disingenuous thing that you've said; right?

24 (Laughter.)

25 DR. POWERS: I seriously doubt that you

1 stayed up nights saying, gosh, I just wish I could go
2 to the subcommittee meeting.

3 MR. GRECHECK: Actually, I did.

4 (Laughter.)

5 MR. GRECHECK: But go to the first slide.
6 This is an immense milestone that we have been doing
7 this for about a year and a half now, and along with
8 the staff, learning what this thing called an early
9 site permit is all about. It's been a very
10 interesting process. I think there are many lessons
11 learned, and one of the things that we are looking
12 forward to, once our application and the other two
13 that are close behind us are completed, I think it
14 would be useful for all the stakeholders to take some
15 time to go through that and figure out what we've
16 learned from this.

17 But as you can see, we submitted our
18 application back in September of 2003. There have
19 been three formal revisions to the application
20 submitted. Primarily of interest for this discussion
21 is revision 3, because that was the one that mostly
22 focused on requests for additional information or
23 changes that we made to the application as a result of
24 requests for additional information.

25 As you know, the staff issued the draft

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1 SER in September, and we are scheduled to respond to
2 essentially all of their remaining open items. You
3 saw the number of open items in the DSER. For the
4 most part we will respond to all of them tomorrow, so
5 that we will have that, and I'll talk about a couple
6 of those questions in a moment.

7 So we are reaching the end of the safety
8 review.

9 DR. APOSTOLAKIS: You said for the most
10 part?

11 MR. GRECHECK: There are two that we --
12 one we answered earlier, and there is one that will be
13 answered at the end of this month. But the vast
14 majority will be answered tomorrow.

15 DR. APOSTOLAKIS: Thank you.

16 MR. GRECHECK: On the next slide, as you
17 can see, one seismic open item response was answered
18 back in January. We did also provide some extensive
19 feedback on the draft SER and that is -- that was
20 provided electronically, but that is on ADAMS and is
21 accessible.

22 DR. POWERS: Now that is a contradiction
23 in terms.

24 (Laughter.)

25 MR. GRECHECK: That I won't comment on.

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1 We have had several phone calls to discuss
2 open items, and we did have a meeting last week with
3 the staff over in the other building to go through the
4 entire list of open items and attempt to come to some
5 level of understanding as to the acceptability of the
6 responses that we plan to make in our submittal
7 tomorrow.

8 Based on all of those meetings, we think
9 that technical resolution appears to be achievable.
10 I did want to take a few minutes just to talk about
11 seismic, since obviously there is a great deal of
12 interest on that subject here among the subcommittee
13 members.

14 I think what we will hear today is that we
15 are all exploring this for and having some interesting
16 growing pains as we go through this process.

17 I think you may be aware that all three of
18 the ESP applicants essentially have used the same
19 methodology. This was work that was done by EPRI in
20 response to changing NRC requirements during the last
21 decade.

22 So basically any questions that we see on
23 this application having to do with the models or how
24 the models were used or the basis for the models will
25 apply to the entire industry at this point. So it's

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1 pretty much a generic issue.

2 I think -- and I certainly will let the
3 staff discuss how they did their review, but some of
4 the questions that we are seeing at the moment are
5 starting to get into details of some of the
6 constituent models that went through this SSHAC
7 process, and I think once we start getting into that,
8 we are getting into issues where the applicants,
9 including us, did not go through and try to
10 selectively pull items out of the models.

11 We went through the process; that doesn't
12 mean we necessarily agree with all of the models or
13 the conclusions that were drawn by the models, but
14 that's what the process was supposed to deal with.
15 The process was supposed to come to this consensus
16 position based on the various model inputs.

17 So I think that as the afternoon
18 progresses, we may see some discussions on that.

19 DR. APOSTOLAKIS: Now this EPRI model was
20 a process; it was not just a model?

21 MR. GRECHECK: Correct.

22 DR. APOSTOLAKIS: It had never been
23 blessed by the NRC staff.

24 MR. GRECHECK: That is correct.

25 DR. APOSTOLAKIS: Although a regulatory

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1 guide later said you can use either that or the
2 Lawrence Livermore approach. That's kind of a
3 blessing.

4 MR. GRECHECK: Right.

5 DR. POWERS: Well, I mean you come in and
6 you say here is this thing that was developed, what is
7 it now --

8 DR. APOSTOLAKIS: '89, since '89.

9 DR. POWERS: So 15, 20 years ago. Some
10 long time ago. And in the intervening period, we find
11 that the data base they used is now called into
12 question. Isn't the whole process called into
13 question now? Or certainly all of its conclusions are
14 called into question.

15 DR. APOSTOLAKIS: Again, it depends on
16 whether the data or the model is in question. I mean
17 the data I can understand. They are updating their
18 data base, but the models are questioned as well.

19 MR. GRECHECK: But they are much newer
20 than 1989. I think the SSHAC process is what, '97?

21 DR. APOSTOLAKIS: Well, let me understand.
22 When you say SSHAC, you are referring to that seismic
23 hazards?

24 MR. GRECHECK: Yes.

25 DR. POWERS: That you might know something

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1 about, George.

2 DR. APOSTOLAKIS: No, because I didn't see
3 it anywhere in the document.

4 DR. POWERS: It's not mentioned in polite
5 company.

6 DR. APOSTOLAKIS: But SSHAC itself again
7 recommended the process.

8 MR. GRECHECK: That is correct, and that's
9 the process that we used to develop the EPRI --

10 DR. APOSTOLAKIS: Oh, that's what you
11 used?

12 MR. GRECHECK: Yeah.

13 DR. APOSTOLAKIS: I read all 150 pages.
14 I didn't see anything about that in there.

15 MR. SMITH: Marvin Smith with Dominion.

16 Just to clarify a little bit, the EPRI
17 model that we are talking about is the CEUS ground
18 motion model. There was a lot of work done, as you
19 know, back in the late '80s by EPRI, Livermore, and
20 others, when these were originally developed, and one
21 of the criteria in Reg Guide 1165 is that there was an
22 expectation that if 10 years or so passed that you
23 would go back and reexamine the models, et cetera.

24 So the -- and again, this isn't discussed
25 in a great deal of detail in our ESP application, but

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1 it is discussed in detail in the EPRI reports that are
2 referenced in that application, and so what EPRI did
3 is applied the SSHAC process, the SSHAC level 3
4 process, to develop a new CEUS ground motion modeling,
5 and that is the ground motion modeling that we have
6 applied.

7 DR. APOSTOLAKIS: And what is the date of
8 this?

9 MR. SMITH: The model itself was completed
10 in 2003. Actually the final project report itself was
11 actually only issued in the end of 2004, December
12 2004. There were interim reports issued, a model was
13 developed, but this is a very recent model.

14 Again, what they did is they went through
15 a literature search and identified quite a lot of work
16 that has been done in the last 15 years, and had a
17 process to go through and pick out the constituent
18 models to make up this ground motion model based on
19 much more recent work than what was available in the
20 late '80s.

21 DR. APOSTOLAKIS: But how is that helping
22 you? I mean according to your first slide, by
23 September of '04, you had completed the version REV 3.

24 MR. SMITH: Correct.

25 DR. APOSTOLAKIS: And you are saying that

1 the EPRI document came out in December. Maybe --

2 MR. SMITH: There were previous EPRI
3 documents on this modeling work that came out. But in
4 other words, EPRI did the actual model itself and the
5 original -- the initial documentation was completed
6 before we submitted our application back in 2003. But
7 EPRI continued to work and to -- and issued a final
8 project report. It didn't really change the model in
9 any way, but it did further document the details of
10 the process that they went through in order to develop
11 this model, and that final project report, which we
12 submitted, if you look here at the -- where we
13 indicate that the open item response was submitted in
14 January 25th, 2005, one of the open items dealt with
15 some of the details that were involved in this
16 modeling effort, and so what part of what we did in
17 that January 25th, 2005 submittal is submit this
18 December 2004 final project report, which contained
19 additional details about the SSHAC process, the level
20 3 process they followed, and how they came to develop
21 the CEUS ground motion model.

22 DR. APOSTOLAKIS: Your basic approach is
23 this EPRI work?

24 MR. SMITH: For the ground motion modeling
25 itself.

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1 DR. APOSTOLAKIS: For the ground motion,
2 not for the --

3 MR. SMITH: Not for the data, no. The
4 EPRI report is on ground motion model; in other words,
5 how you model the ground motion from the point of
6 origin to the plant.

7 DR. APOSTOLAKIS: The seismicity part, the
8 seismic curves, those were from where? From the
9 regional '89 study?

10 MR. SMITH: We went through and did a --
11 we certainly took that, but we went through a data
12 updating process and looked very extensively at all of
13 the data sources, et cetera, and updated that until --
14 to reflect again the knowledge that had been gained
15 since.

16 DR. APOSTOLAKIS: Do we have access to the
17 EPRI report of 2004?

18 STAFF: Not the 2004. I think we have an
19 earlier version.

20 MR. SMITH: Well, again, that was
21 submitted with this January 25 submittal, so it's
22 certainly on the docket now.

23 DR. APOSTOLAKIS: Okay, great.

24 DR. POWERS: All right.

25 MR. GRECHECK: So I knew seismic would be

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1 interesting, so I'm glad we brought that up.

2 So with the exception of that, we really
3 do believe that with the responses that we are going
4 to provide tomorrow and the discussions we have had
5 with the staff that it appears that the remaining
6 technical issues on the application are well under --
7 on the path to being resolved.

8 So we are looking forward to the next
9 steps in the process, and I just did want to mention
10 one thing here, that we have had some discussions with
11 the staff, and that is we have started reviewing some
12 of the proposed license conditions which also exist in
13 the draft SER, and we are -- have just begun having
14 those discussions, but I would say at this point we
15 still have some issues that -- conditions that we
16 either do not understand or do not believe are based
17 on the -- are adequately based on the materials in the
18 application.

19 The reason I think that is significant is
20 because again this is the first application. Part of
21 the reason that we and the other applicants and the
22 Department of Energy have been working on this at this
23 point was to establish the regulatory basis for the
24 ESP process as we go forward, and I think it is
25 important for us to establish some regulatory

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1 certainty in this process, with some clear criteria
2 and clear expectations for future applicants as to
3 what to expect and how to translate things that you
4 put in your application into expected conditions.

5 So we are going to spend some time with
6 the staff hopefully working on that.

7 So that's all I have.

8 DR. POWERS: Let me ask you a couple
9 questions about that. And I guess it's a question
10 about what your going-in philosophy was in preparing
11 this document.

12 You're asking for a site permit that will
13 be valid for the next 10 to 20 years, so you are in
14 some respects prognosticating what the future is, yet
15 throughout much of your application there's very
16 little prognostication whatsoever. It is more saying
17 the future shall be much like the past, and here's
18 what the past looked like.

19 So why did you eschew the prognostication?

20 MR. GRECHECK: Do you have some specific
21 areas of --

22 DR. POWERS: Sure. Let's turn to the
23 meteorology work in which everything is based on
24 "this is kind of what we have seen in the past," yet
25 I have got an entire world that is saying, well, no,

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1 the weather is changing.

2 Now some of those say that it is a
3 systematic change; some of those say, no, this is a
4 minor fluctuation. But they all agree that the
5 weather is changing in the coming years from what it
6 has been in the past. But your application seems not
7 to make -- let me put a caveat:

8 Anything I say about your application may
9 be incorrect because I didn't find it, okay? I'm
10 still struggling a little bit with this electronic
11 gizmo, so it's sometimes hard for me to find things.
12 And feel free to correct me if it's in there.

13 But I could not find this, any recognition
14 of this worldwide body of opinion. Some of those
15 opinions have impact.

16 For instance, I can find for you
17 relatively easily people saying, well, the hurricane
18 frequency is going to double, and then I can find you
19 some experts that say, yes, and those hurricanes are
20 going to be worse, and the others say, no, there are
21 going to be more of them, but they're going to be
22 milder hurricanes.

23 But I mean there's not a hint of that kind
24 of information in the application. And I wonder why.

25 MR. GRECHECK: Because I think that the

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1 same dilemma that you just described, there is
2 certainly a large body of papers and people's opinions
3 out there about what that is, but based on what I have
4 seen from everybody that hypothesizes one effect, you
5 will find somebody that will hypothesize some other
6 effect.

7 You have to make some base line for design
8 and traditionally, both from a design standpoint and
9 from a regulatory standpoint, what you do is you go
10 through the historical record, you attempt to discern
11 from that historical record what you believe bounding
12 conditions are, and you use those bounding conditions
13 for both licensing purposes and for design purposes.

14 DR. POWERS: But, see, here is a case
15 where it's not clear that the past is bounding. Okay,
16 you could take, for instance, the worst of the
17 experts. You can say, okay, well, here's a guy that
18 says this is the worst frequency of hurricanes that I
19 can find in the literature, and here is the worst
20 intensity of those hurricanes that I can find in the
21 literature, and that would be bounding.

22 I mean I think everybody would concede
23 that that was bounding because you could show that
24 nothing in the past has been much worse than that.

25 The thing that is distressing, especially

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1 with respect to hurricanes, is you say, well, there's
2 been this many since the dawn of time or when people
3 actually recorded the fact that there were hurricanes,
4 and the worst ones, where you find all the worst ones
5 were in the last 40 years.

6 Okay, that's not a comforting thing, if
7 I've got people predicting more and worse coming in
8 the future.

9 Let me be fair. I'm going to ask the same
10 question of the staff, so you guys can prepare your
11 answers.

12 MR. SCOTT: This is Mike Scott with the
13 NRC staff. I would be happy to answer now if that
14 would work for you. Let him go? Okay.

15 DR. POWERS: Let Mr. Grecheck explain to
16 me.

17 DR. APOSTOLAKIS: Can we pursue this point
18 a little more?

19 DR. POWERS: Sure.

20 DR. APOSTOLAKIS: Two questions or
21 comments.

22 As Dana just said, this permit will be
23 valid for 20 years -- is that what it is? Yeah. If
24 there is new data from now until then, does the
25 regulation -- do the regulations ask you to go back

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1 and update the study, or whatever basis you used to
2 get the permit?

3 MR. GRECHECK: The way I understand it,
4 the regulations require at the time that we would come
5 in for a COL application, if we chose to do that, if
6 we were aware of significant changes, then we would be
7 required to bring that up.

8 DR. APOSTOLAKIS: But the second point
9 now, you have a couple of statements in the -- or at
10 least I read them in the SER, but I'm sure they were
11 in your original application, updating the data base
12 from '89 or whatever EPRI used then, to today, or to
13 whenever you submitted your application.

14 The new earthquake now has a recurrence
15 period of about 500 years, when people thought at that
16 time it was several thousand years? In the Charleston
17 earthquake -- I mean these are the two largest
18 earthquakes east of the Rockies. Again went down, I
19 think, 550 years from several thousand. Wow, that's
20 pretty impressive.

21 DR. POWERS: Not nearly as impressive as
22 the fact that it only had a 1 percent effect on their
23 risk.

24 (Laughter.)

25 DR. APOSTOLAKIS: But, my goodness, if the

1 permit is valid for 20 years, and I extrapolate from
2 what I read happened in the last 15 years, am I going
3 to see such dramatic changes in the next 20 years,
4 too? Are you going to reduce that to 10 years? Or
5 something else? Is this -- in other words, how mature
6 are the theories that we're using or the models or the
7 data? This is a pretty dramatic change. It's almost
8 like a PRA guide playing with the exponents of the 10
9 to the minus 6, and say, well, yeah, I don't think
10 it's 10 to the minus 5. Yeah, but in seismic, I would
11 expect it to be a little bit more serious.

12 So what do I do, in other words? If I
13 want to be a cautious regulator and I read that, and
14 I know that I am about to approve a permit -- not me
15 personally, but a permit for you guys for 20 years,
16 wouldn't that bother me that there was such dramatic
17 change in something that I thought was -- had a very
18 long return period? Or is that something we have to
19 live with? Do we have enough conservatism somewhere
20 to cover ourselves?

21 MR. GRECHECK: Well, I think we do. I
22 think what experience has shown us, not only here but
23 internationally with many industrial facilities that
24 have been exposed to actual earthquakes as opposed to
25 hypothesized ones, is that the actual robustness of

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1 those structures and complements is much greater than
2 what we analytically assume in these calculations.

3 DR. APOSTOLAKIS: I think that's a true
4 statement.

5 MR. GRECHECK: So I think that there is
6 significant margin and significant conservatism, and
7 I suggest that particularly in an area of seismic,
8 which is not, in my opinion -- and I am by no means a
9 geologist or a seismic expert, but it is not -- up to
10 now has not be extraordinarily precise or -- what I'm
11 trying to say is that the -- translating between
12 theory and actual observed effects does not appear to
13 be extraordinarily robust. There seems to be a great
14 deal of assumption and perhaps almost parametric type
15 models that develop that.

16 If that is the case, then I think that we
17 have a lot to learn. But I think based on actual
18 experience, particularly when structures have been
19 exposed to actual ground motion, it suggests that
20 there is much more robustness than what we assume for
21 analytical purposes for safety.

22 DR. POWERS: Mr. Scott, you want to do --
23 pitch in something here?

24 MR. SCOTT: Mike Scott, NRC staff.

25 Regarding the question in general, we have

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1 a regulatory framework in Part 52 that includes a
2 process by which if the parameters as defined in the
3 early site permit are exceeded at some later time when
4 an applicant comes in for a combined license
5 application, there is a process by which the issues
6 can be revisited.

7 There are some predictions in the early
8 site permit application, and the staff refers to them
9 in its safety evaluation report, but in any event, the
10 early site permit applicant, and ultimately if they
11 are successful, the early site permitholder, is
12 burdened with providing boundaries that they will be
13 able to live with at the combined license stage, and
14 if the site falls outside those boundaries, then the
15 applicant needs to provide additional analyses that
16 show that the site is still adequate.

17 DR. POWERS: Well, I guess I understand
18 your response. There is imbalance in the presentation
19 of the application in the level of detail that raises
20 this question of why wouldn't you discuss -- I mean
21 the argument gets made that, well, the future is
22 difficult to predict, and I think that is probably
23 true, but when you say it's difficult to write on it
24 because there are conflicting opinions, in fact, when
25 you read your seismic section, you go through and say,

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1 well, there are differences of opinion on the past as
2 well.

3 You make judgments on who to include and
4 who not to include, and we'll explore a couple of
5 those judgments in a minute. But I mean you are
6 perfectly capable of assessing people's writings on
7 the past, but you seemed unwilling to discuss the
8 future, and I mean in granting something for the
9 future, shouldn't we think a little bit about the
10 future, rather than saying, well, we'll wait until
11 somebody is going to actually use this?

12 I mean it's a very practical approach, but
13 then we can throw out the whole process and say, okay,
14 when you are ready to put up a plant, come in and tell
15 us about your site.

16 You are still going to be caught in the
17 position of having to predict the future, there for 40
18 years instead of 20.

19 MR. GRECHECK: But even at that point
20 there would be no -- under the current regulatory
21 scheme, at least, there would be no requirement, even
22 if this were a COL application, to try to predict what
23 the weather, for example, would be over the next 40
24 years.

25 You would use exactly the same approach

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1 that has been used here, where you look at historical
2 data and you come up with bounding conditions.

3 DR. POWERS: All you are doing is changing
4 the question, which is --

5 MR. GRECHECK: I understand.

6 DR. POWERS: Okay, why don't you change
7 the regulation? Which may be my question, after all,
8 right?

9 Okay, I promise that we would talk about
10 some of the discussions of the past. Let's talk about
11 the Weems fault and quaternary fault, evidence of
12 fault activities in the site.

13 You go through and you excuse the Weems
14 fault. That doesn't exist. And whatnot. And you
15 cite Crone and Wheeler for doing that, and you excuse
16 a lot of the evidence of quaternary activity based on
17 Crone and Wheeler.

18 When we go to Crone and Wheeler, we find
19 indeed they went through and they looked at a number
20 of these pieces of evidence, and they classified them
21 into classes, A, B, C, and D, the only one of which of
22 those classes that we care at all about are the A
23 class.

24 But when we look at what they did, they
25 looked at physical evidence on the surface, and then

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1 said, now, is there any evidence that this has been
2 active in the last 5,000 years? And if it wasn't,
3 they immediately put it into a lower category.

4 Aren't we asking a different question?
5 Here is this physical surface manifestation.
6 Shouldn't we be asking the question is there any
7 evidence that this has not been active before we
8 excuse it?

9 MR. GRECHECK: Obviously I'm going to ask
10 for some technical help here because I'm certainly not
11 able to answer that directly. But again, I feel that
12 the approach that has been used has been
13 systematically applied in the way that has been done
14 for previous applications and is what is expected by
15 the staff.

16 But if Marvin or Steve or someone wants to
17 make a more technical discussion, I would be willing
18 to yield my place on the floor to them.

19 MR. SMITH: Again, this is Marvin Smith.

20 I don't think we have the seismic
21 technical expertise here to discuss this in detail at
22 this point.

23 DR. POWERS: Well, I don't want to get
24 hung up on the specific. I bring up specifics to say
25 it's a specific question. It is really the

1 philosophical question of how you go about disposing
2 of this evidence. I mean should the disposition --
3 how many of these things can I excuse by whatever
4 argument versus how many should I include, barring
5 there being definitive evidence to exclude it?

6 I mean how do you approve it? What was
7 the philosophy of approach? Because I can find you
8 papers in the literature that are different than Crone
9 and Wheeler, take a different view than Crone and
10 Wheeler. Crone and Wheeler, maybe they have a better
11 PR man than these guys do. You know, I mean a lot of
12 people look at Crone and Wheeler, but there are other
13 papers in the literature, and what I am trying to
14 understand, what I am struggling with understanding is
15 what was the philosophical underpinning on looking at
16 the surface manifestation?

17 Because, now, recognize that at your
18 particular site, you've got an awful lot of fault
19 activity that has no surface manifestations, and that
20 too raises a question.

21 MR. SMITH: Well, again, we did a very
22 comprehensive, not only literature review, but you
23 know, engaged a number of consultants to go out and do
24 field studies, to -- and recorded the details of all
25 of that in our application and basically presented

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1 that for review.

2 You know, when you are dealing with
3 seismology, of course, you have a lot of uncertainty
4 associated with that, and that's one of the reasons
5 why you go through these studies where you consider
6 not only the data, but the epistemic uncertainties and
7 those are all taken into account, and you come up with
8 at the end of the day SSEs that are extremely
9 conservative.

10 And then those very conservative safe
11 shutdown earthquake ground motions have to be shown to
12 be again very conservatively included in the design or
13 structure of systems and components that are important
14 to safety.

15 You know, seismic is certainly not one of
16 those things that affords itself the absolute
17 certainty that, as you say, some particular event has
18 never occurred. It's nearly impossible to prove the
19 fact that something hasn't happened or can't possibly
20 happen. And I don't think that is really the way you
21 do these studies.

22 You try to look at taking all of the
23 literature into account, taking the very conservative
24 approach, not only on what the sources might be, but
25 what the recurrence intervals are, and incorporating

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1 those into your analysis.

2 For example, you point out the fact that
3 the New Madrid and Charleston earthquake recurrence
4 intervals, the postulated recurrence intervals were
5 significantly reduced in the last 15 years.

6 I would also observe, however, that that
7 did not have a dramatic effect on the calculated safe
8 shutdown earthquake, and I think the reason for that
9 is that the overall process of developing the safe
10 shutdown earthquakes incorporates a considerable
11 amount of data and epistemic uncertainty into it.

12 DR. APOSTOLAKIS: Well, New Madrid is too
13 far away.

14 MR. SMITH: New Madrid is too far away.
15 Charleston, for central Virginia, is pretty far away
16 as well, although as we point out in our application,
17 certain people have postulated, although it's not
18 really -- again there's uncertainty as to whether this
19 is true or not, but since certain people have
20 postulated that there might be a northern extension of
21 that -- of the fault that resulted in the Charleston
22 earthquake, we did in fact consider and look at that
23 and see whether or not that had any impact on the SSE
24 for North Anna site, for the North Anna ESP site.

25 So, you know, again the approach and

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1 philosophy here is -- and again, it really is this
2 SSHAC process where you -- you know, you go through
3 and you don't dismiss any particular piece of
4 literature, but you really have to come at the end of
5 the day to some conclusions as to, you know, what
6 appears to be a reasonable set of conclusions. And we
7 think we have done that.

8 DR. POWERS: Let me take a quote here.
9 Crone and Wheeler assessed the faulting at Adarona as
10 likely to be of quaternary age. But because the
11 likelihood has not been tested by detailed
12 paleoseismological or other investigations, this
13 feature was assigned to class C, which effectively
14 means we don't worry about it.

15 In other words, they said, okay, well, we
16 got this thing, we don't know a damn thing about it,
17 so we'll not worry about it. And you have accepted
18 that.

19 Now why wouldn't you say no, no, no, no,
20 that is fine for an academic study, I'm doing a
21 practical thing, I want to be reasonably bounding.
22 Why didn't I say I'll put that in class A? Because I
23 don't know. Okay? That's what I'm trying to
24 understand.

25 MR. SMITH: Well, I think again if you

1 were to take that approach, you would again never
2 reach a conclusion on, you know, anything.

3 DR. POWERS: Why would I not reach a
4 conclusion? It seems to me I would reach a
5 conclusion.

6 MR. SMITH: Well, I guess you would -- if
7 the conclusion -- I just don't think you can go
8 through and we didn't attempt to have our seismic
9 experts go through and we said, you know, we assembled
10 a team of seismic experts and said take this, look at
11 all the data, and give us your best technical
12 judgment. And that's what they did.

13 DR. APOSTOLAKIS: So you're saying the
14 basis was different, then?

15 DR. POWERS: It must have been a different
16 basis because this says because we don't know anything
17 about it, we're going to ignore it.

18 DR. APOSTOLAKIS: And now you're saying
19 they looked at it and they decided it was ignorable.
20 That's a very different basis.

21 DR. POWERS: I mean if it had been said,
22 yeah, we thought about this as not important, you
23 know, I would probably say, well, I may not agree with
24 them, but at least they looked at it.

25 MR. SMITH: Again, we would have to get

1 the technical experts here to discuss that in detail,
2 if that is necessary, but --

3 MR. SCOTT: This is Mike Scott again.

4 As it happens, we have one -- actually
5 more than one technical expert on this subject here.
6 We can either bring them now to address you --

7 DR. POWERS: They can answer the same
8 question.

9 MR. SCOTT: Okay. So we'll just wait
10 until we get to it in our part. Okay. We do have
11 people here that can answer some of these questions.

12 MR. SMITH: Let me discuss with you just
13 for a second, if you don't mind, your question earlier
14 about, you know, meteorological conditions.

15 Again, what you are looking at, if you are
16 establishing, you know, something like a wind speed
17 that's a characteristic value for North Anna ESP site,
18 you know, there's a process you go through that is
19 intended to achieve a very bounding value for that
20 kind of a parameter, and certainly the historical
21 record is the primary thing you have to depend upon to
22 do that.

23 But you do it in really a statistical and
24 very conservative way. I mean it doesn't just simply
25 look at what the highest wind speed I have seen and

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1 say that's it. You know, it goes through and does an
2 analysis of that, but it is based on the historical
3 record.

4 But the purpose of that is to come up with
5 again a conservative representation of what might be,
6 a wind speed or a ground snow load or those type of
7 parameters. And it certainly is not any different
8 than the way it has frankly been done in licensing the
9 current reactors.

10 You know, I don't think anyone for a
11 license in the current reactors -- again, it's a very
12 conservative approach to coming up with bounding
13 values that you can have confidence in, but it's not
14 a process where you go through and attempt to predict
15 future changes in meteorological conditions.

16 DR. POWERS: You say it's conservative,
17 and what I'm asking you is why do you think it's
18 conservative, in the face of this body of world
19 opinion -- I mean it is universal among
20 meteorologists, as far as I can say, that say the
21 weather is changing. And why it's changing, they
22 disagree on, and that's really not germane, why it's
23 occurring is probably not germane.

24 MR. SMITH: Well, for example, if you look
25 at the tornado wind speed, you know, you are coming up

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1 with a process that looks like a 10 to the minus 7
2 type of wind speed probability. And many of the other
3 parameters that you look at, you apply a very
4 conservative approach to the historical data to
5 calculate a parameter.

6 Now if the currents of tornadoes, for
7 example, were to increase, perhaps that's less than 10
8 to the minus 7, as far as what that wind speed would
9 be, but, you know, there is built into the regulatory
10 process and built into the analysis we did a very
11 conservative approach to trying to come up, based on
12 the historical record, with the site characteristics
13 that, you know, would be important to consider in the
14 design of structures, systems and components.

15 But it is based upon the regulatory
16 structure that's in place, and I think, frankly, that
17 regulatory structure appropriately looks at the actual
18 data that you have and then applies some very
19 conservative approaches to interpreting that data to
20 come up with values that give you a conservative
21 design input to your design of your structures,
22 systems, and components.

23 DR. POWERS: I think you are touching on
24 an approach that I think I would have taken on
25 speaking of the prognostication issue. The only thing

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1 missing is to say, okay, I got this approach that's
2 fairly -- and if I look at all these -- it's hard to
3 say they're weather experts. Maybe they're weather
4 specialists in this world, but experts I'm not sure
5 there are.

6 I looked at all those, and it looks like
7 they might move me up from 10 to the minus 7 to what,
8 3 times 10 to the minus 6 or something like that, and
9 that defendants make any difference. Okay. I mean I
10 don't know how far they will move me, but it's not
11 enough for me to change the argument that I'm
12 bounding.

13 And had there been something said like
14 that, then I would probably have to -- I would have
15 mumbled and probably dug out some paper that said it
16 was worse than that to harass you with, but -- other
17 than that, I mean that is not an illegitimate
18 approach, to fall back and say, well, the regulations
19 tell me to do this, I'm not sure that this is mature
20 enough of a regulatory area to derive much confidence
21 from that.

22 MR. SMITH: Well, again, I would point
23 out that it's the same regulatory approach that has
24 frankly been used for licensing the existing fleet of
25 reactors.

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1 MR. GRECHECK: I understand your point,
2 and I think it's something that is worth considering
3 at some point, but I think at this point my thought on
4 that is since there is so much uncertainty about that,
5 if I was going to be putting -- if I was going to use
6 a probabilistic approach on this and say, okay, well,
7 here are some projections that I could surmise from
8 some of these predictions, but then I have to attach
9 some uncertainty level to that --

10 DR. POWERS: Well, I mean that's in fact
11 what you did in the seismic area. You came in and
12 said, well, all right, it changed this, it changed
13 that -- well, that's the uncertainty I have so I'm not
14 going to worry about it. And that kind of an
15 argument, I've gotten in trouble with that.

16 MR. GRECHECK: I could see how that could
17 be done, and I hate to just keep coming back to the
18 standard statement we followed the regulations, but in
19 essence when you are filling out an application like
20 this --

21 DR. POWERS: Yeah, yeah, you probably have
22 to, right.

23 Any other questions on that? If not, I'll
24 move on to another area of interest.

25 DR. APOSTOLAKIS: Well, what is your SSE?

1 The safe shutdown earthquake?

2 MR. GRECHECK: Yes, it's -- you know, it's
3 shown in the application. There's a curve in there
4 that shows you the acceleration versus frequency.

5 DR. APOSTOLAKIS: Yes, but you pick the
6 SSE to correspond with certainly frequencies, do you
7 not?

8 MR. SMITH: Well, it's one of the areas
9 that we think needs further exploration in terms of
10 what you see versus past practice.

11 DR. APOSTOLAKIS: But I thought you said
12 somewhere that you used a mean frequency of 5.5 10 to
13 the minus 5?

14 MR. SMITH: That's an occurrence
15 probability.

16 DR. APOSTOLAKIS: Yeah.

17 MR. SMITH: Okay.

18 DR. APOSTOLAKIS: Doesn't that give you --

19 MR. SMITH: That's not a frequency. In
20 other words, the SSE itself is defined by a curve that
21 shows acceleration as a function of the ground motion
22 frequency of the ground motion.

23 DR. APOSTOLAKIS: No, it's ground
24 acceleration, a frequency --

25 MR. SMITH: There is a peak ground

1 acceleration associated with that, which is the
2 acceleration that occurs at the highest frequency. In
3 other words, the peak -- the PGA is a specific
4 acceleration value that is associated with high
5 frequency accelerations.

6 MR. SCOTT: This is Mike Scott.

7 I might just insert, when we get to the
8 staff's presentation, we will be projecting that SSE
9 figure.

10 DR. APOSTOLAKIS: Okay. Fine. Fine. No
11 more questions for you.

12 DR. POWERS: What I would like to touch
13 upon now, again it is not much the specifics as the
14 philosophical underpinning of the approach you adopted
15 here that I am most interested in, but I'm going to
16 try to pick specific things just to give us something
17 concrete to discuss.

18 When I look at the items in the
19 application, in some cases I find a fairly elaborate
20 background, and then it comes out and here's the
21 number we got. Okay, and it will even say, okay, I
22 followed this particular procedure, you know, Reg
23 Guide 1.65, and I got this number. But it doesn't
24 show me any of the steps, and I can pull the Reg Guide
25 or whatever document you have used, and I can look at

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1 the procedure, and I say, you know, gee, there are a
2 lot of steps, and I'm not sure I can reproduce this
3 number.

4 And now some part of this may be because
5 I am still struggling with the electronic manipulation
6 of a 2,000-page document on a slow computer or
7 something like that, so correct me if I'm wrong, but
8 in general I had a hard time going through and saying,
9 here is the number they got. Here, for instance, are
10 the Chi over Q ratios that they obtained, and I don't
11 know how they got -- I mean I can't sit down and say,
12 oh, yeah, yeah, that's the number I would have gotten,
13 or it's two times the number I would have gotten, or
14 10 percent of the number I would have gotten.

15 Where do I go to find that? Do I have to
16 come down to your site?

17 MR. SMITH: Well, you talk, for example,
18 about Chi over Q, that involves statistical analysis
19 of three years worth of hourly meteorological data.
20 Now we don't put three years worth of meteorological
21 data, obviously, in the application. We certainly
22 provided that data to the NRC so that they could, for
23 example, independently run an analysis to confirm the
24 results that we achieved.

25 And so, you know, in a lot of cases, you

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1 know, the data involved is pretty extensive and is not
2 going to be included in the application, but certainly
3 if the staff, the NRC staff considers it important
4 enough that they want to do their own independent
5 analyses, then we provide them with the data and also
6 with the detailed engineering calculations to the
7 extent that they want to see that.

8 DR. POWERS: I guess it's the engineering
9 calculations.

10 MR. SMITH: The engineering calculations
11 are much more than 2,000 pages. You're probably -- I
12 hesitate to guess how many pages it is, but it's a lot
13 more than 2,000. And so you don't try to incorporate
14 all of that detailed engineering calculational
15 packages into the application. It is basically the
16 results of those analyses and a description of the
17 methodology that you used to attain those results that
18 are included in the application.

19 But the analyses themselves and the data
20 is certainly available. It's in our records. It's
21 been provided, you know, as requested by NRC, and so
22 it's there to the extent that it's necessary to look
23 at it.

24 DR. POWERS: I mean, for instance, when we
25 talk about Reg Guide 1.6 -- I mean it's kind of a

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1 prescription, and again, I'm just using this as an
2 example. I'm trying to understand the philosophy
3 behind the application.

4 I mean, couldn't you have gone through and
5 said, okay, step number one was this, this is what we
6 did, and if you want to go into the details, it's in
7 such and such? And then step number two is this, and
8 then you come down until you finally get this Chi over
9 Q ratio.

10 MR. GRECHECK: You could, yeah, but --

11 DR. POWERS: It's just an alternative.
12 I'm just trying to understand how you selected to do
13 what you did, because it results in a tremendous
14 balance in the document. I mean in some cases there's
15 more detail than probably I can handle, and in some
16 cases it's so terse, I say, well, okay.

17 MR. GRECHECK: And again, I think there
18 was a very concerted attempt to have a writer's guide
19 in the preparation of this application to have some
20 consistency in that. So if you see those kinds of
21 things, it was because a decision was made that this
22 is using a standardized methodology which people
23 familiar with the process should be aware of how this
24 works, so therefore, you know, we have that
25 calculation certainly in our records, but a person

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1 familiar with this should understand what's happening
2 here. And if they want to come and look at the
3 detail, they can.

4 In other cases where we were trying to
5 develop a methodology that may not perhaps exist or
6 may not have been commonly known, then there's more
7 detail put in there to try to explain what that
8 methodology is.

9 DR. POWERS: I mean that's as good a
10 rationale as I can think of for doing it. I mean Chi
11 over Q ratios, I could probably go look at your FSAR,
12 you probably did the same thing, had the same ratios
13 and whatnot in it.

14 MR. GRECHECK: Correct.

15 DR. POWERS: Any other questions?

16 And you thought this would be quick,
17 didn't you?

18 (Laughter.)

19 DR. POWERS: Okay. Well, thank you very
20 much. And we will move on to Mr. Scott. And, Mr.
21 Scott, I am going to interrupt you at 2:45. You have
22 chosen to start late, so you will have to suffer the
23 consequences of that, of your own election here.

24 MR. SCOTT: Yes, I made that decision and
25 didn't even know I did it.

1 (Laughter.)

2 DR. POWERS: I'm going to interrupt this
3 at 2:45 to take a break, and then we will just resume.
4 So think about -- recognize that.

5 MR. SCOTT: Okay, fine.

6 I believe before I get started that the
7 section chief for New Reactors, Laura Dudes, would
8 like to make a few remarks.

9 MS. DUDES: My name is Laura Dudes.

10 I think I would be remiss if I didn't take
11 this opportunity to thank Michael Scott for the work
12 that he has done, and you are going to get -- part of
13 our agreement for Mike's transition date was he had to
14 make it through today and tomorrow with ACRS before he
15 comes over to you.

16 But I do want to recognize the work that
17 he has done on this first-of-a-kind project, and also
18 introduce Belkys Sosa which you know from ACR-700, as
19 your new early site permit project manager.

20 DR. POWERS: If she's going to drive the
21 early site permits the way she did ACR-700 -- is that
22 --

23 (Laughter.)

24 MS. DUDES: I don't think so. George just
25 asked if Mike is moving.

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1 DR. POWERS: He's coming with us.

2 MS. DUDES: We sent out a memo at some
3 point.

4 DR. POWERS: George, if you would come to
5 meetings, you would know.

6 (Laughter.)

7 DR. POWERS: He's one of the kindred.
8 We've got to be nice to him.

9 MS. DUDES: We did choose to start late.
10 I just want to take a step back on the early site
11 permits and talk about some of the activity, recent
12 activity that we are looking at.

13 I think, as has been said several times,
14 these are first-of-a-kind reviews. We are learning
15 lessons as we go through these early site permits.

16 We talk about the 20-year duration, and I
17 think those are good questions. We need to look at
18 what is going on today. We may be looking at three
19 and four-year durations before we are actually sitting
20 back here looking at a COL as a group and questioning
21 these activities.

22 The current environment of new reactors,
23 the activity is increasing and it's increasing at an
24 exponential rate. We are talking about COLs. We are
25 talking about COLs in the next several years, and I am

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1 not even talking about one anymore. People are
2 starting to become more and more specific.

3 Now as other national policies continue to
4 move in this direction in the next year, we should
5 start to see this flurry of maybe circular activity
6 sort of shoot out of the gate in a straighter line,
7 and we are going to get a lot busier.

8 So these early site permits we talk about,
9 it is a product of Part 52. It's important that we
10 get it right. It's important that we ask the right
11 siting questions because it is feasible and probable
12 that these permits can be -- could be referenced in
13 applications in the near time rather than long term.
14 So I think that is really important.

15 The other thing is just as information or
16 for all of you is that North Anna, this North Anna
17 application is the first application to go. We have
18 two more that are staggered at two-month intervals, so
19 we are here today to discuss the draft safety
20 evaluation report for North Anna, and we will be in
21 full committee tomorrow.

22 Basically after that we are going to have
23 Clinton and we will have Grand Gulf to follow in the
24 next several months, and the staff is working on doing
25 a high quality safety review and also trying to do

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1- that within a published timeframe and schedule. So
2 you will see us coming to you with a draft SER at two-
3 month intervals, and then we are going to come right
4 out of that and we will be back together again,
5 sitting here with the final for North Anna.

6 So I know that Mike is going to talk about
7 getting an interim letter, and hopefully by the end of
8 today we will have a good idea of where we stand on
9 the draft and what we need to do and how we need to
10 communicate in the future.

11 DR. POWERS: Professor Wallis, your
12 subcommittee chairman, would like to retire.

13 MS. DUDES: Well, I think it is important
14 to recognize, we are looking at resources from a new
15 reactor agency standpoint for the Office of General
16 Counsel, our new reactor staff, the technical staff.
17 But I think it is also important to step back and look
18 at our scheduling and resource burden over in the
19 ACRS. We have three early site permits that are
20 staggered by two months.

21 Now you move forward into the next year or
22 two and you are working on design certification for a
23 ESBWR. You may have another early site permit. We
24 may be getting into combined license preapplication
25 and license reviews.

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1 So as we progress and define our resources
2 and our expansion or possible expansion, I think the
3 ACRS should take a look at that as well, and we will
4 try and provide you with that information and
5 communicate with your branch chief as much as possible
6 on this.

7 So with that, Mike.

8 MR. SCOTT: Okay. Do we need to pause
9 here or keep going?

10 DR. POWERS: No, Jack is going to take
11 over as being chairman while I go and do my little
12 thing.

13 MR. SIEBER: You'd better speak quickly
14 while Dana is out of the room.

15 MR. SCOTT: Okay, let's get right to it.

16 DR. APOSTOLAKIS: At 2:45, we have been
17 promised a break.

18 MR. SCOTT: We are on slide two, and this
19 is of course just the purpose. Our purpose here today
20 is to brief the subcommittee on this application and
21 the staff's review of that application, and to support
22 the subcommittee's review in the subsequent committee
23 interim letter that we are going to request that you
24 send to the commission.

25 Next slide.

1 This is today's agenda. Now, of course,
2 when we made this presentation up, we didn't know
3 exactly what the subcommittee's interest would be. We
4 have gotten a little smarter in the last hour on that.
5 We may spend less time on some of these things as you
6 prefer.

7 I would like to go through and just go a
8 little bit over where we have been and where we are
9 going, so you will understand the context for the
10 discussion that follows.

11 Regarding the questions that were raised
12 of Dominion that perhaps the staff could weigh in on,
13 we do have a full complement of tech staff reviewers
14 here who can answer some of those questions that
15 perhaps need an answer from the staff.

16 Next slide.

17 This slide number four just discusses the
18 regulatory framework we are in here, which of course
19 is subpart A to 10 CFR Part 52, which governs early
20 site permits, and Part 52 references subpart B to 10
21 CFR Part 100, which contains the applicable siting
22 evaluation factors.

23 10 CFR 52.23 requires an ACRS report to
24 the commission on safety reports, so that's of course
25 why we are here today.

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1 The purpose of the ESP process itself is
2 to resolve issues at an early stage before a large
3 expenditure of resources is needed to identify site
4 issues.

5 As Laura mentioned, North Anna is the
6 first of three of these. Basically you have the other
7 two applications coming at two-month intervals, and
8 then by the time you are done with those, then the
9 final safety evaluation report will be complete, and
10 so you will have three more opportunities to review
11 these applications. And most all that happens this
12 calendar year.

13 DR. APOSTOLAKIS: The other two have not
14 been submitted yet; is that --

15 MR. SCOTT: No, all three applications
16 have been submitted. They were all actually submitted
17 within about three weeks of each other in late 1993.
18 It's just that we staggered the review of each of them
19 by two months, just for staff resource constraints.

20 DR. APOSTOLAKIS: You mean 2003?

21 MR. SCOTT: What did I say? '93? 2003.
22 Sorry. 2003.

23 DR. APOSTOLAKIS: They start getting --

24 MR. SCOTT: Although the applications
25 essentially came in simultaneously, the staff does not

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1 have the resources to review three of them
2 simultaneously.

3 This one was put on the fastest track.
4 Exelon Clinton follows two months after this one, and
5 Grand Gulf two months after that.

6 DR. APOSTOLAKIS: All right.

7 MR. SCOTT: Okay. Where we have been. I
8 mentioned that the applications were submitted in
9 September '03. We docketed it a month later. The
10 staff issued its draft environmental impact statement
11 in December '04, and we issued our draft safety
12 evaluation report the same month and provided to the
13 committee the first week of January -- or excuse me,
14 the last week of December of '04.

15 Our schedule, our current scheduled
16 assumes an ACRS interim letter to the commission in
17 March of '05.

18 The schedule then follows for the staff to
19 provide the final safety evaluation report to the
20 committee in late May 2005.

21 Now I notice it does say prior to final
22 division director and OGC concurrence. This is
23 similar to a practice that I understand that we
24 proposed to the committee for AP-1000. You have an
25 essentially final document, but with a few steps you

1 have to go just to final reviews of the final SER
2 mostly in the Office of General Counsel.

3 We would then issue the final safety
4 evaluation report in June of '05. We assume -- again
5 our schedule assumes an ACRS final letter to the
6 commission in July of '05.

7 We will incorporate that letter, make any
8 changes if necessary, in a supplemental FSER and
9 issue the final safety evaluation report as a NUREG
10 currently scheduled to occur at the end of August of
11 '05.

12 We then have mandatory hearings. As you
13 may be aware, the Part 52 process requires a hearing
14 for all early site permits, and this one in fact has
15 a contested hearing, and that hearing will occur we
16 believe some time in the fall of this year or at least
17 begin in the fall of this year. We the staff, of
18 course, have no control over that schedule.

19 DR. APOSTOLAKIS: Who is contesting it?

20 MR. SCOTT: There were three intervenors,
21 Greenpeace -- I'm going from memory here -- Public
22 Citizen, and Little Ridge Environmental Defense
23 League.

24 Bob can correct me here. What were the
25 intervenors?

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1 MR. WEISMAN: I'm Bob Weisman within the
2 Office of General Counsel.

3 I am representing these -- I am
4 representing the staff in the North Anna proceeding.
5 It was the NIRS, Nuclear Information Resource Service,
6 not Greenpeace. But the other intervenors Mike
7 correctly identified.

8 MR. SIEBER: And the issues?

9 MR. SCOTT: Now there were a number of
10 contentions raised. The Atomic Safety and Licensing
11 Board admitted two, both of them on the environmental
12 side.

13 One of them has since been settled, and
14 the one that remains is regarding striped bass in Lake
15 Anna.

16 No contentions were admitted on the safety
17 side.

18 Okay, so we have the hearings coming up at
19 the end of -- after all the staff's review products
20 are complete, then we will have the hearing, and then
21 the commission decision is assumed or expected in mid-
22 2006. Of course, that's their prerogative as to when
23 they actually issue, if they issue.

24 Next slide, please.

25 Just to give a few details about the North

1 Anna site and the application. It was submitted for
2 a site basically within the existing North Anna Power
3 Station site, adjacent to the existing Units 1 and 2,
4 and partially overlying the cancelled Units 3 and 4.
5 You may recall from the 1980s that Dominion did begin
6 construction on two additional units, and then
7 cancelled them and subsequently removed much of the
8 construction material, though I understand the base
9 mat is still there for Units 3 and 4.

10 North Anna Power Station is owned by
11 Virginia Power and Old Dominion Electric Cooperative
12 and controlled by Virginia Power.

13 Dominion Nuclear North Anna, LLC, who is
14 the applicant for this early site permit, is, like
15 Virginia Power, a wholly owned subsidiary of Dominion
16 Resources, Incorporated.

17 Dominion has requested the limited work
18 authorization in accordance with 10 CFR 52.17.

19 Dominion has requested that their site be
20 approved for the location of two units, and I put that
21 term in parentheses -- in quotes for a reason. The
22 units would be of up to 4300 megawatts thermal
23 capacity, but a unit is not necessarily one reactor in
24 this case, because Dominion has declined to submit a
25 specific design at this stage.

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1 They have decided that they would prefer
2 to retain the flexibility to make a decision on the
3 design later, and have used what is referred to as the
4 plant parameter envelop approach, which we briefed the
5 committee on in the past as part of their early site
6 permit process.

7 So they developed their PPE, plant
8 parameter envelope, based on a number of current
9 designs of interest which you can see there on the
10 slide.

11 So each unit may be one large reactor, or
12 more than one smaller reactors.

13 DR. APOSTOLAKIS: Has the NRC agreed that
14 the number of smaller reactors constitute one unit?
15 I mean the ACRS was hopelessly split in one of its
16 letters as to the goals that would apply in such a
17 case.

18 MR. SCOTT: There is an ongoing
19 discussion, an issue resolution, I believe within the
20 staff regarding what allowances or requirements apply
21 to multiple units on one site. And I believe that is
22 still a current issue.

23 DR. APOSTOLAKIS: So Dominion calls it a
24 unit, but we are not calling it a unit? We don't know
25 what we're calling it.

1 MR. SCOTT: I would state that slightly
2 differently. We -- they have submitted plant
3 parameters, plant design parameters that are
4 representative and that they intend to be bounding for
5 these reactor designs, and we are reviewing their
6 plant parameters from the standpoint of whether they
7 are reasonable or not.

8 It is then the applicant's burden to make
9 sure that they picked parameters such that when they
10 come in on a combined license with an actual design
11 that it fits within those parameters.

12 So our safety evaluation is not based per
13 se on what a unit is.

14 DR. APOSTOLAKIS: I understand that, but
15 I mean your first bullet says Dominion requests site
16 approval location of two units.

17 MR. SCOTT: Yes.

18 DR. APOSTOLAKIS: Why did you have to put
19 that two there?

20 MR. SCOTT: Because that -- well, that is
21 in fact what the applicant did. The applicant --

22 DR. APOSTOLAKIS: That affects in a real
23 way the parameter envelope?

24 MR. SCOTT: Yes. Each unit is 4300
25 megawatts. The total -- correct me if I'm wrong --

1 DR. APOSTOLAKIS: Forty-three hundred is
2 the total or --

3 MR. SCOTT: I think it's 8600 total. I'm
4 getting nods back there. Okay, 8600 total. Okay. So
5 4300 each megawatts thermal.

6 DR. APOSTOLAKIS: I guess it's unclear to
7 me why calling it a unit --

8 MR. SCOTT: It's almost -- it's a
9 bookkeeping exercise to account for the fact that if
10 you look at the reactors that they used in their PPE,
11 they are of widely differing sizes.

12 DR. APOSTOLAKIS: Sure.

13 MR. SCOTT: And they are asking the NRC to
14 accept that 4300 megawatts thermal of new capacity can
15 be put on this site, and that might be two ESBWRs or
16 it might be four ACR-700s or whatever. So that --

17 DR. APOSTOLAKIS: Of these, we have
18 certified APR-1000, right, an ABWR?

19 MR. SCOTT: Correct.

20 DR. APOSTOLAKIS: And the ABWR.

21 MR. SIEBER: But their ABWR has a power
22 upgrade.

23 MR. SCOTT: That's correct, yes.

24 DR. APOSTOLAKIS: And we are in the
25 process of certifying ESBWR, aren't we?

1 MR. SCOTT: Now the ESBWR, we believe we
2 are going to receive in the near future for
3 certification.

4 DR. APOSTOLAKIS: How about the GT-MHR?

5 MR. SCOTT: Those are further out.

6 DR. APOSTOLAKIS: IRIS?

7 MR. SCOTT: Also further out.

8 DR. APOSTOLAKIS: PBMR?

9 MR. SCOTT: Also further out.

10 MR. SIEBER: It would appear that the
11 gross megawatt thermal is a description of the fission
12 product and the energy --

13 MR. SCOTT: The accident analysis is based
14 on the -- actually on two of the designs that were
15 chosen here. It is important to understand that if
16 this applicant, if Dominion receives an early site
17 permit, it will not be for any particular design.
18 Nothing on this list will it be approved for.

19 When an applicant chooses to use the PPE
20 concept, they are seeking additional flexibility,
21 accepting the fact that they are leaving additional
22 issues, if you will, open for the combined license.

23 DR. APOSTOLAKIS: And they did
24 representative source for AP-1000?

25 MR. SCOTT: AP-1000 and ABWR.

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1 MS. DUDES: Mike, can I just clarify? We
2 have not -- the only design that we have certified,
3 gone through the entire rulemaking process, is the
4 ABWR. AP-1000, we have issued the final safety
5 evaluation report, but that's in process of design
6 certification, and we are awaiting an application for
7 design certification of ESBWR.

8 DR. APOSTOLAKIS: The commission has not
9 decided this?

10 MS. DUDES: Correct. Correct. AP-1000
11 is not a certified design at this time. It is in
12 process.

13 DR. APOSTOLAKIS: Wasn't there a limit at
14 some point of 3800 megawatt thermal?

15 MR. SCOTT: Where did you see that? I
16 don't --

17 DR. APOSTOLAKIS: No, I'm thinking about
18 in the past. I mean most plants licensed in the U.S.
19 were limited to 3800 megawatt thermal, I thought.

20 MR. SCOTT: I'm not aware of a limit like
21 that, certainly I'm not aware of one in the
22 regulations.

23 DR. APOSTOLAKIS: Well, that's when System
24 80 came out and matched the limit.

25 MR. SCOTT: Well, that design may have

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1 been certified to that limit. I don't -- I'm not
2 aware of an NRC generic limitation on the size.

3 Just to address a little bit more the PPE
4 concept. We talked about this. Our review of the PPE
5 values is limited to whether they are reasonable. It
6 does not approve any -- if we do issue an early site
7 permit that addresses PPE, we are not approving siting
8 of a particular design.

9 The staff plans to include in any early
10 site permit that might be issued for this site the PPE
11 values that are used in the staff's evaluation of
12 compliance with regulations.

13 The combined license applicant will, as I
14 mentioned earlier, need to show the design falls
15 within the PPE values that are specified.

16 Next slide.

17 There was some change to the application
18 part way through regarding its cooling system, just
19 for your information. Originally both units were to
20 be cooled by the lake, in one case through once-
21 through cooling; in the other case, through possible
22 use of a cooling tower.

23 There were concerns raised regarding the
24 ability of Lake Anna to support two reactors of this
25 size, and so the applicant changed their application

1 to what you see here, that Unit 3 would use once-
2 through cooling, and Unit 4 would use a dry, closed
3 loop cooling system to discharge heat to the
4 atmosphere, and not to the lake.

5 This would be a very large dry cooling
6 system.

7 DR. WALLIS: Dry radiative cooling?

8 MR. SCOTT: Yes.

9 DR. WALLIS: By radiation only?

10 MR. SCOTT: It's closed loop, yes.

11 DR. WALLIS: No convection at all?

12 MR. SCOTT: Convection radiation.

13 DR. WALLIS: I think it needs some
14 convection. You might have trouble on a cloudy day or
15 something, or certain days, a sunny day, let's say,
16 the sun might actually radiate more to you than to the
17 world.

18 MR. SCOTT: Okay. The applicant has
19 specified that if their design that they ultimately
20 select at COL requires an ultimate heat sink, then
21 that heat sink will be underground, which has some
22 import, as we will talk about in a few minutes.

23 Dominion is considering the use of the
24 existing intake and discharge structure in the
25 cancelled Units 3 and 4, which remains. It was not

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1 removed as a result of the cancellation of Units 3 and
2 4.

3 And they are seeking 20-year early site
4 permit term, as was discussed earlier.

5 Just to talk a bit about the draft safety
6 evaluation report, as Laura mentioned, this is a first
7 of a kind. We did have a generic issue resolution
8 process with the industry before the early site permit
9 applications were received, to attempt to identify
10 issues that could come up in the review of early site
11 permits and resolve them.

12 Inevitably, we didn't capture all such
13 issues before the applications were submitted, and so
14 we have had some additional issues come up during the
15 application reviews.

16 The review guidance document that the
17 staff has used, I believe the committee is at least to
18 some extent familiar with, because we have briefed you
19 on it several times in the past, and that is review
20 standard RS-002.

21 Next slide.

22 This slide just is a list of the review
23 areas and the staff reviewers. Most of those staff
24 reviewers are here today to answer your questions in
25 these various areas.

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1 DR. POWERS: The RS-002, by the way, is a
2 fine document.

3 MR. SCOTT: Is a what?

4 DR. POWERS: A fine document. And I
5 really, really benefited from going through this
6 first. What I like best is the scope and associated
7 review summary you have right up in the beginning that
8 says here's what it is and here's where it is, things
9 like that. That's nice.

10 MR. SCOTT: We appreciate that comment.

11 Next slide.

12 Oh, let me go back --

13 DR. POWERS: Let me ask you, how does that
14 compare or what do you do with this siting guide from
15 EPRI?

16 MR. SCOTT: Which one is that, please?

17 DR. POWERS: Siting guide. Site selection
18 and evaluation criteria for early site permit
19 applications from EPRI.

20 MR. SCOTT: I would say we have not
21 directly used that. The staff, I believe, had access
22 to that during development of the individual sections
23 of the review standard, but the review standard is the
24 staff's application guidance and its references, of
25 course.

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1 Before we leave the list of individual---

2 DR. POWERS: Well, there must have been
3 some election made here not to come up with something
4 jointly for --

5 MR. SCOTT: Something what?

6 DR. POWERS: Jointly.

7 MR. SCOTT: That, I believe, would be a
8 correct statement, yes. NEI had provided some
9 suggestions -- this is probably three years ago.

10 DR. POWERS: Right.

11 MR. SCOTT: And the staff looked at that,
12 of course, but we developed our review standard
13 independently of what NEI had proposed.

14 DR. POWERS: Okay. It was very helpful.

15 MR. SCOTT: Thank you.

16 Before we leave the list of areas and
17 reviewers here, I just want to mention that the staff
18 benefited from a number of expert inputs. In
19 hydrology, meteorology, and site hazards areas, we had
20 support from Pacific Northwest Laboratory, and in some
21 cases some independent evaluations were done by those
22 folks.

23 In geology and seismology, our staff
24 benefited from support from the United States Geologic
25 Survey, and one of the experts in that area is here

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1 today.

2 In the emergency planning area, the NRC
3 consulted extensively with the Federal Emergency
4 Management Agency.

5 So we had a large team involved in
6 reviewing the document.

7 I would like to now talk about some of the
8 issues that have emerged during the review of this
9 application.

10 Some of them are not directly related to
11 this site, but came up during review, and so I wanted
12 to pass them on to you.

13 First of all, regarding emergency
14 planning. Dominion, like the other two early site
15 permit applicants, elected to seek acceptance of what
16 are referred to as major features of emergency plans
17 as provided in 10 CFR 52.17.

18 That concept, major features, is not
19 defined in detail in the regulation, and so we have
20 ended up having to deal with, well, exactly what is a
21 major feature and what finality does it provide to the
22 applicant.

23 The review guidance that we have used for
24 review of major features is a draft NUREG, actually
25 supplement to a NUREG, which you see there on the

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1 slide. It's a joint NRC-FEMA document.

2 The industry, the three applicants --

3 DR. POWERS: Do we have a copy of this?

4 I have not seen a copy.

5 MR. SCOTT: We will get you one.

6 DR. POWERS: I have not seen a copy of
7 this.

8 MR. SCOTT: Okay. We can get you one.

9 There has been some concern in the
10 industry regarding the degree of finality associated
11 with major features because, of course, the
12 applicant's objective at early site permit is to
13 achieve finality on as many features as it can.

14 And as it turns out, where we are with
15 major features is if a major feature is provided,
16 typically we are talking about limited level of detail
17 of information. The staff can, at the early site
18 permit stage, review that information and if it finds
19 the description to be acceptable, conclude that that
20 major feature is acceptable, and that conclusion is
21 final, subject to the requirements of 10 CFR 52.

22 However, the implementation detail of the
23 major feature that is provided is not reviewed by the
24 staff at early site permit under this option, and so
25 those implementation details are subject to additional

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1 consideration at combined license.

2 So that's where we are with this
3 currently, and you might say it's a limited finality
4 that the applicant can obtain with the major features
5 option.

6 Moving on to seismic. As was noted
7 earlier, Dominion has proposed a new performance-based
8 approach for determining safe shutdown earthquake.

9 Clinton Exelon also proposed using that
10 approach.

11 It is not entirely consistent with the NRC
12 approved method in our Reg Guides. It is described in
13 this particular ASCE standard 43-05 that you see
14 referenced here on the slide, it is a risk-based
15 approach that targets a performance goal which you see
16 there, 1 times 10 to the minus 5th annual probability
17 of unacceptable performance of category 1 systems,
18 structures, and components.

19 DR. APOSTOLAKIS: What does that mean?
20 I'm trying to understand what that means.
21 Unacceptable --

22 MR. SCOTT: I'll ask my expert to answer
23 that. Cliff Munson.

24 MR. MUNSON: I'm Cliff Munson. I'm with
25 the Division of Engineering.

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1 The 1 times 10 to the minus 5 refers
2 directly to the onset of inelastic deformation.

3 DR. APOSTOLAKIS: Is it a deformation
4 probability, is it unconditional? Well, what is it?
5 I mean this is what?

6 MR. MUNSON: It's a goal, performance goal
7 that we set, 1 times 10 to the minus 5, and that's the
8 target, and so --

9 DR. APOSTOLAKIS: This would include the
10 occurrence of the earthquake or --

11 MR. MUNSON: Right, the ground motion.
12 Right, right, right.

13 DR. APOSTOLAKIS: Okay.

14 DR. POWERS: So it's per year?

15 MR. MUNSON: Per year.

16 I would like to add here that on the next
17 slide -- I'm stealing Mike's show a little bit, but
18 North Anna decided --

19 DR. POWERS: I think he'll give it up.

20 (Laughter.)

21 MR. SCOTT: Yeah, I can handle that.
22 That's fine. You're doing great.

23 MR. MUNSON: Yeah, they decided to
24 withdraw.

25 DR. APOSTOLAKIS: Well, let's go back and

1 understand the implications of this. Back to slide
2 14.

3 MR. MUNSON: Let me finish what I was
4 saying.

5 The next early site permit applicant has
6 decided to retain this, so we are going to have much
7 more detail, we might even have a meeting on this.

8 DR. APOSTOLAKIS: So you would take then -
9 - you would look at all the category 1 systems,
10 structures, and components, and you would take -- you
11 would pick the one for which the onset of what --

12 MR. MUNSON: Inelastic.

13 DR. APOSTOLAKIS: Inelastic deformation
14 occurrence first, I guess, as a minimum of some sort.
15 I don't know. And then you would say the probability
16 of that should be less than or equal to 10 to the
17 minus 5, or the frequency of this occurring should be
18 less than -- and this would be the mean frequency?

19 MR. MUNSON: That is mean, yes. It's
20 mean.

21 We actually --

22 DR. APOSTOLAKIS: Isn't that a little
23 high?

24 MR. MUNSON: Well, it's based on the core
25 damage frequencies for the plants that have done

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1 seismic PRAs, and --

2 DR. APOSTOLAKIS: It's based on it. What
3 does that mean?

4 MR. MUNSON: Several of the existing
5 nuclear power plants have had seismic PRAs done as
6 part of IPEEE, and they -- those values, the
7 probability of core damage frequency, that 1 times 10
8 to the minus 5 was based on that, on that value.

9 DR. POWER: Didn't that satisfy the LERF
10 safety goal, the 10 to the minus 5th?

11 DR. APOSTOLAKIS: Well, actually it
12 should, because the onset of the elastic deformation
13 is not necessarily LERF.

14 DR. POWERS: That's right. But if it were
15 LERF, you would still meet the safety goals.

16 DR. APOSTOLAKIS: You would still meet it.

17 DR. POWERS: So this ought to be pretty
18 good.

19 DR. APOSTOLAKIS: Right.

20 DR. WALLIS: I don't know if I understand
21 this. There are lots of different structures,
22 systems, and components. They all have a probability
23 of this happening. Is 10 to the minus 5th the highest
24 probability of all of them? The lowest probability of
25 all of them? Or do you add up the probabilities of

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1 all of them?

2 MR. MUNSON: No, it's --

3 DR. APOSTOLAKIS: So you could have less -

4 -
5 DR. WALLIS: So you could have a hundred
6 with 10 to the minus 5 probability, which would give
7 you 10 to the minus 3 probability.

8 MR. MUNSON: No, it's not -- every system,
9 structure, component category 1 has to at least have
10 1 times 10 to the minus 5 as -- that's the guarantee
11 of the new approach.

12 DR. APOSTOLAKIS: I think the question is
13 what if you have a hundred of them?

14 DR. POWERS: Well, even if you did, it
15 didn't matter.

16 MR. MUNSON: Because they are not
17 compounding.

18 DR. APOSTOLAKIS: Why not?

19 MR. MUNSON: I mean what you are
20 essentially saying is -- this is not a random event,
21 that's why.

22 DR. POWERS: For one. And for two, once
23 you hit this level, they are saying this is tantamount
24 to having an accident.

25 DR. APOSTOLAKIS: I think that's it.

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1 DR. POWERS: Okay. And there's clearly
2 margin built into that.

3 MR. MUNSON: But like I say, in the next
4 two months or so, you will see a lot more detail on
5 this.

6 DR. APOSTOLAKIS: Another 10,000-page --

7 DR. POWERS: But I think your last line --
8 I think it is hard to say that it's incorrect because
9 that's your assessment, but the last line I think you
10 are really targeting this as a comparison to LERF and
11 not core damage frequency.

12 MR. MUNSON: I'll have to look that up to
13 verify that.

14 MR. SCOTT: Okay, I think we have already
15 talked to some of this. The staff informed the
16 applicant after they submitted their application that
17 the time required for review of this method,
18 performance-based method, would likely result in a
19 delay of completion of the review of the application,
20 and the applicant ultimately decided that they --

21 DR. POWERS: Can we do that with you,
22 that, you know, you send over these 2,000 pages? Can
23 we send a note and say it's likely to result in delay
24 in review of your application?

25 (Laughter.)

1 MR. SCOTT: Can we send a note? No.

2 MS. DUDES: Did you want me to answer
3 that, Mike?

4 (Laughter.)

5 MS. DUDES: No.

6 DR. POWERS: Guess what. Tough.

7 MR. SCOTT: So in response to that
8 concern, the applicant ultimately elected to use the
9 Reg Guide 1.65 method, with justification for use of
10 a reference probability of 5 times 10 to the minus 5th
11 per year, which they provided to us.

12 DR. APOSTOLAKIS: See, that's where I also
13 got confused. Some probabilities were medium, some
14 were mean. Is this a mean value?

15 MR. MUNSON: It's a mean value.

16 DR. APOSTOLAKIS: It's a mean value, 5 10
17 to the minus 5 per year of what? Or reference
18 probability, which would mean something, right?

19 MR. MUNSON: The reference probability is
20 the probability of exceeding the SSEs for the 29
21 sites, existing nuclear power plant sites.

22 DR. APOSTOLAKIS: So then there is a
23 statement there that I don't quite understand. And
24 then if you do that, then you have high confidence
25 that 50 percent of the plants have not -- are no worse

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1 than you are, or something like that?

2 MR. MUNSON: Right.

3 DR. APOSTOLAKIS: This is something that's
4 interesting.

5 MR. SCOTT: This is in Reg Guide 1.65.

6 DR. APOSTOLAKIS: The committee has
7 reviewed this at some point and said it's okay? Or
8 was it a different committee?

9 (Laughter.)

10 MR. MUNSON: I don't know. This was
11 before my time.

12 What happens is you calculate the
13 reference probabilities for each of these 29 sites,
14 and then you take the median or the median level.

15 DR. APOSTOLAKIS: And you couldn't have
16 said that in the document?

17 MR. MUNSON: It's in the document.

18 DR. APOSTOLAKIS: It's not. I found it
19 two, three times there.

20 MR. MUNSON: I can show you the reference.

21 DR. APOSTOLAKIS: Well, I'll show you,
22 it's in one document, but not this document.

23 MR. SCOTT: If we could go -- Belkys, take
24 us one more forward, please. There you go.

25 This is a diagram from the application

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1 that shows the development of the site's SSE. The
2 lower two curves, as you can see from the legend, are
3 the low and high frequency spectra at 5 times 10 to
4 the minutes 5th. And you can also barely see the
5 performance-based spectrum that the applicant
6 submitted, that Dominion submitted. It basically is
7 overlain by the selected SSE spectrum.

8 Dominion chose to use an SSE spectrum that
9 falls on top of their performance-based spectrum. The
10 staff accepts or plans to accept that based on the
11 fact that it is conservative with respect to the 5
12 times 10 to the minus 5th low and high frequency
13 curves.

14 Our potential acceptance of that does not
15 mean we have accepted the performance-based method.
16 We have simply accepted that they have chosen an SSE
17 that is conservative.

18 DR. APOSTOLAKIS: So how does this figure
19 -- how am I to read this figure? I mean the
20 independent variable is the frequency? So that if I
21 go in with a frequency of 10 hertz --

22 MR. MUNSON: If you look at the frequency,
23 you consider that as the natural frequencies of
24 different systems, structures in a nuclear power
25 plant. So our resident frequency say of 5 hertz

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1 would have a ground motion acceleration value of, you
2 know, going up to the -- you know, .1 g or .2 g or
3 whatever.

4 DR. APOSTOLAKIS: Or .3, yeah. So then
5 they should design it --

6 MR. MUNSON: Right.

7 DR. APOSTOLAKIS: The ones that will have
8 5 hertz natural frequency should what? Design so that
9 --

10 MR. MUNSON: Well, in an ideal world, they
11 would pick a certified design that envelopes their SSE
12 so they would be good to go. They wouldn't have to
13 figure out the natural frequency of every component or
14 structure.

15 MR. SCOTT: However, that's an item we are
16 about to discuss.

17 DR. APOSTOLAKIS: I'm still trying to
18 understand how to interpret the figure.

19 MR. MUNSON: Can I --

20 DR. APOSTOLAKIS: Absolutely.

21 MR. MUNSON: The red curve that you see,
22 the spectrum, is the high frequency earthquake. That
23 would be an earthquake of magnitude 5.4 earthquake at
24 20 kilometers from the site. That's the ground motion
25 from a magnitude 5.4 earthquake at 20 kilometers from

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1 the site.

2 The blue curve is the low frequency
3 earthquake which would be a Charleston earthquake, the
4 magnitude 7.2 at 300 kilometers from the site.

5 If they were using the Reg Guide 1.165
6 approach, their SSE would follow that blue curve until
7 it intersected the red curve, and then it would go up.
8 And that would be the SSE they would choose.

9 They chose to continue to use a
10 performance-based approach because it envelopes those
11 two spectra.

12 DR. APOSTOLAKIS: Didn't we just say that
13 they did not follow that?

14 MR. SCOTT: The point I think that Cliff
15 was trying to make, and I tried to make it as well,
16 was that they could have chosen a curve higher even
17 than the one they did, and it would be even more
18 conservative.

19 DR. APOSTOLAKIS: Right.

20 MR. SCOTT: Okay. So as long as the curve
21 they chose is conservative compared to the red and the
22 blue curves, we are all right with it. We are okay
23 with it, not because it was developed from
24 performance-based spectrum or performance-based
25 approach, but rather because it is conservative.

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1 DR. POWERS: Well, it's conservative with
2 respect to what you have chosen, you know, red and
3 blue, that you like. You somehow have confidence in
4 red and blue.

5 Now when we go and look where red and blue
6 came from, all of a sudden maybe we are not so
7 conservative.

8 MR. MUNSON: Well, I believe we are. I
9 mean we follow -- we have followed the regulatory
10 guide approach or guidance. We -- the application
11 used the earlier EPRI modeling approach with updates
12 to characterize the seismic sources.

13 They also updated the ground motion
14 modeling, and they went through the entire process to
15 redo their probabilistic seismic hazard assessment,
16 and they come up with these two earthquakes as the
17 controlling earthquakes for the site.

18 Now whether --

19 DR. APOSTOLAKIS: It's a result of whether
20 --

21 MR. MUNSON: Right. That's all based on
22 their probabilistic seismic hazard modeling.

23 DR. WALLIS: What did they do with this
24 unnamed fault that traverses this site? It just isn't
25 allowed to have an earthquake? Or --

1 MR. MUNSON: They determined, and we
2 evaluated this determination, that that fault is not
3 a capable fault.

4 DR. WALLIS: I see.

5 MR. MUNSON: Well, let me finish. In the
6 eastern and central U.S., it is very unlikely to
7 characterize, to have a one-to-one association between
8 faults and seismic activity.

9 So what is done for these seismic hazard
10 assessments is to characterize area source zones where
11 there is seismic activity or faults that are presumed
12 to be active.

13 Instead of characterizing individual
14 faults, you characterize the whole area and say this
15 area is capable of a magnitude 6 earthquake every
16 1,000 years or every 500 years, or every 250 years.
17 That is the type of input that gets put into your
18 probabilistic seismic hazard modeling.

19 The individual faults are generally not --
20 you are not able to correlate those one to one with
21 seismic activity in the central and eastern U.S.
22 There is just not enough large earthquakes that come
23 and rupture to the surface, so you can't -- like you
24 can in the western U.S., you can look at the San
25 Andreas fault and say there is seismic activity there.

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1 The earthquakes in the East are small, so
2 they don't rupture the surface, so you can't attribute
3 an earthquake to a specific fault.

4 So what you do is you make area zones.

5 DR. APOSTOLAKIS: So the regulatory
6 guidance then for the criterion of 5.5 times 10 to the
7 minus 5 epistemic mean frequency per year results in
8 a curve here?

9 MR. MUNSON: Right, those two curves.

10 DR. APOSTOLAKIS: And this -- and it comes
11 from the analysis of EPRI and -- okay. Okay. And
12 then the selected curve is a little more conservative
13 of the blue line, but it's right on the red line for
14 higher frequencies.

15 MR. MUNSON: Right.

16 DR. APOSTOLAKIS: And this is derived in
17 a way that is described in the regulatory guide, or
18 the regulatory guide says just be conservative?

19 MR. MUNSON: No, it's -- the step-by-step
20 methodology is in the regulatory guide. And basically
21 the regulatory guide says we have accepted the
22 Livermore or the EPRI modeling. Every 10 years you
23 need to update it, and that is what they have gone
24 through. They have gone through and updated the
25 ground motion and the magnitudes.

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1 DR. APOSTOLAKIS: So this spectrum then is
2 not the result of a single earthquake; right?

3 MR. MUNSON: Right. This is all the
4 sources. Right, it's a composite of all the sources
5 and their recurrence and their magnitudes and their
6 ground motion. All those factors.

7 DR. APOSTOLAKIS: So we don't talk about
8 an SSE of a specific magnitude anymore?

9 MR. MUNSON: Right. What we do is we get
10 the final hazard curves and then we go and deaggregate
11 those curves. We take apart those curves to see which
12 earthquake magnitude and distance is contributing the
13 most, and that becomes our controlling earthquake. So
14 we have two controlling earthquakes, a low frequency
15 and a high frequency.

16 DR. APOSTOLAKIS: Where is all this
17 discussed?

18 MR. MUNSON: In Reg Guide 1.65.

19 DR. APOSTOLAKIS: Can I get a copy?

20 DR. POWERS: As long as we've got you
21 here, and because I've got to get along with Mike here
22 in the future, you have outlined what I think is the
23 conventional wisdom on how we handle East Coast
24 earthquakes. Don't know much about them, so we just
25 sum an average and things like that for areas.

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1 But in your own report, I see seismicity
2 maps, seismic events that take place in the East
3 Coast, and what I see is two parallel lines. I see
4 one line that moves from the New Madrid area up
5 through Tennessee, and I see another one that moves
6 from the southern part of the United States right up
7 smack dab through this site, with lots of little blue
8 dots on it, suggesting that there have been historical
9 earthquakes of magnitude greater than 3.

10 That suggests to me that now on those two
11 parallel lines, which from the geostatigraphy, as I
12 understand it, reported by the applicant, makes sense.
13 They should be parallel lines of earthquakes because
14 you've got one thing pushing in against another. It
15 says you should look for capable and incapable faults
16 around the site. Indeed, that is what the applicant
17 has done, is he has gone through and looked at things
18 and looked at lots of them, and we can agree or
19 disagree with his assessments on whether those faults
20 are capable.

21 Did you review that material or not?

22 MR. MUNSON: Well, what we do is we start
23 as -- our starting point is they have elected to use
24 the 1989 or late '80s EPRI model. That characterizes
25 all the seismic sources in the central and eastern

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2 Now their obligation after that is to go
3 through and assess any new information since the late
4 '80s and see if those characterizations are still
5 correct, of the ground motion as well as the seismic
6 sources.

7 So we have reviewed that information.
8 Basically what Dominion did is they threw out every
9 postulated possible fault in the local and regional
10 area, and discussed why or why not they thought that
11 was a capable fault.

12 And so it was our job to look through and
13 see whether we agreed with that or not.

14 DR. POWERS: Okay. And so I come back to
15 the Crone and Wheeler categorization question. They
16 used Crone and Wheeler as the basis for judging
17 whether there is quaternary activity at areas where
18 there is evidence of seismic activity.

19 Yet when you look at Crone and Wheeler,
20 this was a more academic study, and they demanded
21 positive evidence that there had been seismic activity
22 at a geological approach to put it in class A. If
23 it's not in class A, you really don't care about it.
24 Okay?

25 And if there wasn't, then they would put

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1 it in one of the lower classes.

2 It seems to me that from a regulatory
3 point of view, you take a different approach to this.
4 And especially when they take and they put something
5 in nonclass A simply because it hadn't been
6 investigated. That seems the wrong basis for us to
7 exclude.

8 MR. MUNSON: Well, first let me say, we
9 actually have Dr. Crone here. He was one of the
10 advisers that we had, and I will have him come up and
11 he can address that directly.

12 But what I also --

13 DR. POWERS: He can address what he did.

14 MR. MUNSON: Right, but what I --

15 DR. POWERS: What you need to address for
16 me is what the regulatory philosophy is.

17 MR. MUNSON: Well, whether a fault, an
18 individual fault is categorized as A, B, C, or D is
19 less important as to how the overall area seismicity
20 or seismic activity is characterized.

21 In other words, the only thing I'm worried
22 about --

23 DR. POWERS: Since I threw out all the
24 active things, I know how the overall area is going to
25 be --

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1 MR. MUNSON: Well, what we are concerned
2 about with these individual faults that are in the
3 area is the surface faulting potential at the site
4 itself.

5 As long as the area seismicity is captured
6 in the modeling, then whether an individual fault is
7 active or not -- I mean they are assessed and if you
8 read the RAIs and the RAI responses, you will see
9 pages and pages of discussion about whether this fault
10 is active or not, or capable or not.

11 So I don't think -- I tend to get the
12 impression that you thought that, you know, we judged
13 lack of evidence as no evidence. But I would disagree
14 with that.

15 MR. SCOTT: It's 2:45. Do you want to
16 take the break?

17 DR. POWERS: Yeah, it might be appropriate
18 to just go ahead and take a break here for -- until
19 what is that, 3:02.

20 [Whereupon, the foregoing matter went off
21 the record at 2:49 p.m. and went back on
22 the record at 3:03 p.m.]

23 DR. POWERS: Now, Mike, you're really not
24 getting through your slides very fast, so --

25 (Laughter.)

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1 MR. SCOTT: I'll work real hard on that.
2 It's entirely in my control, of course.

3 DR. POWERS: You have the ultimate in
4 control here.

5 MR. SCOTT: If we can pick up -- are we
6 ready to begin, or do we need to wait on the others?

7 DR. POWERS: We do not need to wait. We
8 have a quorum at two.

9 MR. SCOTT: Okay. Would you like to
10 discuss further the questions regarding the Crone and
11 Wheeler information? Do we need to get Dr. Crone up
12 here?

13 DR. POWERS: Well, no, what my -- I
14 couldn't care less about Crone and Wheeler, to be --
15 I'm trying to understand the philosophical approach
16 that the staff is taking.

17 MR. SCOTT: Okay.

18 DR. POWERS: I want to understand the
19 philosophy that was taken in the application. I want
20 to understand how the staff viewed it when they read
21 this.

22 MR. SCOTT: Right.

23 DR. POWERS: Because if you come through
24 in the various assessments on what is and is not a
25 capable fault made in the application, and the staff

1 reiterates those judgments, and I am trying to
2 understand how they came to that conclusion. Okay?

3 I mean on the face of it, I would not have
4 come to that conclusion, it seems to me, because I
5 would have operated on a different basis. I would
6 have said this must surely be a capable fault, save
7 there is evidence to the contrary. And yet that seems
8 not to be the way that things were done.

9 MR. SCOTT: Would you speak to that,
10 Cliff?

11 MR. MUNSON: Well, basically once again,
12 we have a central Virginia seismic zone. We have a
13 wide area zone. That zone is classified as a
14 magnitude 6.8 capable source zone.

15 Many of these faults that we are
16 discussing -- for example, the Weems fault, the Hills
17 Shear fault, the Mountain Run, all these faults are
18 within that central Virginia seismic zone. So they
19 would be double counted if we assumed that these are
20 all capable faults.

21 Now part of the probabilistic seismic
22 hazard method is to look at the seismicity, look at
23 these faults, and evaluate their capability, their
24 characteristics, and that's what EPRI did in the late
25 '80s, and then they updated this for their early site

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1 permit application.

2 So we asked RAIs about some of these local
3 faults, and Dominion had their experts respond. We
4 had our USGS experts evaluate their responses. We
5 evaluated the responses also as the staff and came to
6 the conclusion that, you know, these faults are not
7 capable. These are paleozoic faults associated mostly
8 with the Appalachian Orogeny in the late paleozoic, so
9 -- and perhaps some of the seismic activity when the
10 Atlantic Ocean reopened.

11 But as far as evidence for activity in the
12 last 10,000 years, we did not see any.

13 DR. POWERS: Do you think what you have
14 done is adequately reflected in your SER?

15 MR. MUNSON: I believe so.

16 DR. POWERS: I mean in general you come in
17 and say yeah, what he said.

18 MR. MUNSON: Well, I think that's a simple
19 -- I believe we have provided an adequate basis for
20 most of our determinations. I am open to elaborating
21 further.

22 MR. SCOTT: Shall we move on?

23 DR. POWERS: Please.

24 MR. SCOTT: Let's go back, Belkys, to a
25 previous slide, number 16.

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1 Another seismic issue that has come up is,
2 as I believe Cliff noted earlier, North Anna is a rock
3 site, and what we have noted is that the site SSE,
4 which we have discussed, exceeds the design SSE at
5 high frequencies for certified designs to date.

6 That item is really in the following
7 status:

8 The application has identified what the
9 SSE is for the site. The staff has evaluated that SSE
10 as noted in the SER. A combined license applicant
11 would need to resolve the disparity if one exists
12 between the SSE for the design and the SSE for the
13 site.

14 Let's go back to slide 18, please, Belkys.

15 This is a figure, and it's not
16 particularly clear as projected, but I think you will
17 find it clear in your handout.

18 However, it turns out that we have
19 transposed the two curved scales there. In other
20 words, the darker curve, the black curve, is the site
21 SSE and the red curve is the Reg Guide 1.0, 1.60 SSE.
22 So I apologize for that.

23 In any event, as you can see, at high
24 frequency, if you can -- I'm having a little trouble
25 wrapping my brain around this thing being backwards -

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1 - but at higher frequencies, the site exceeds the
2 design, and that, of course, in the perfect world that
3 was discussed earlier, the design would be -- let me
4 get this right -- the design would bound the site SSE
5 and no further analysis would be necessary at combined
6 license.

7 But that is not the case for this site.
8 So this is --

9 DR. POWERS: Okay, I come in here for a
10 COL. I've got to deal with this issue.

11 MR. SCOTT: Yes.

12 DR. POWERS: How much does that open up?

13 MR. SCOTT: It -- whoever comes in at COL
14 and would seek to reference this early site permit
15 will need to show that their plant is safe from a
16 seismic perspective on this site.

17 Now there are undoubtedly several possible
18 ways to do that, and we are not fixing that at the ESP
19 stage.

20 DR. POWERS: But I'm asking, it opens --
21 it seems to me that this is a vulnerability of the
22 two-step licensing process.

23 MR. SCOTT: It is a -- I guess, and Cliff
24 can correct me if I go wrong here, but I would say
25 that it is because of the fact that we are putting a

1 new regulatory framework into practice, and this is
2 one of those things that was identified as part of
3 putting that into practice.

4 Yes, there are limitations in a process
5 that resolves some issues up front and others it
6 leaves for the later stage in the process.

7 Again, ideally every site issue would be
8 completely resolved at early site permit and would not
9 come up again at combined license. But there are
10 bound to be certain aspects of the site-related issues
11 that carry over, and so that was a longwinded answer
12 to it is a part of the two-step process that is
13 involved here.

14 Moving on, slide 19.

15 Another issue that has come up is
16 regarding -- and I believe Dominion pointed out -- I
17 don't know if they mentioned it this afternoon, but
18 there has been some concern regarding what are we
19 attempting to do at early site permit. Are we
20 attempting to identify site characteristics, or design
21 inputs? And some of the wording in our safety
22 evaluation report led to some concern on the
23 applicant's part that we are trying to do -- to define
24 at the early site permit stage the design inputs.

25 We note on here that the rule quotations

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1 or partial quotations that you see there, we are
2 attempting and the applicant is required to identify
3 the physical characteristics of the site and establish
4 site parameters, and where the applicant has provided
5 the information appropriate and applicable to general
6 design criterion two as discussed at the bottom of
7 this slide -- that is they provide consideration of
8 the most severe natural phenomena with sufficient
9 margin for limited accuracy, quantity, and period of
10 time in which the data have been accumulated -- then
11 we have attempted to give them credit for that in the
12 safety evaluation report.

13 Next slide.

14 DR. KRESS: Let me ask you a question
15 about that before you go on.

16 MR. SCOTT: Sure.

17 DR. KRESS: Was any consideration given to
18 the site population density around it in these early
19 site permits?

20 MR. SCOTT: Yes.

21 DR. KRESS: For example, was it projecting
22 into the future?

23 MR. SCOTT: Yes.

24 DR. KRESS: Twenty years or so?

25 MR. SCOTT: Yes. In section 2.1 of the

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1 safety evaluation report, we have got an analysis of
2 population projections and Jay Lee is our reviewer for
3 that. Jay can correct me if I state this wrong. It
4 is for the period of the early site permit, correct,
5 if one is granted?

6 MR. LEE: This is Jay Lee, NRR staff.
7 They projected up to 2065.

8 MR. SCOTT: Oh, all right. The term of a
9 40-year plant license added to the 20-year ESP term.

10 DR. KRESS: And the criteria for whether
11 or not that is all right is current site requirements
12 on population density and --

13 MR. SCOTT: We have some regulatory
14 guidance that refers to the nearest population center
15 and how far away it is from the exclusion area.

16 DR. KRESS: And a population center is
17 defined as over so many people in a -- per square mile
18 or something?

19 MR. SCOTT: Is it per square mile?

20 MR. LEE: No, excuse me, the population
21 density is specified in the regulatory guide 4.7 to be
22 500 persons per square mile.

23 Now the population center and the
24 population center distance is specified in Part 100,
25 saying 25,000 people. We consider it as a population

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1 center. And it requires to be 1-1/3 times the
2 distance of a low population zone. In the case of --
3 the LPZ distance is six miles, so 1/3 times six miles
4 is 7.8 miles. So we are looking at whether
5 potentially could they have such a population center
6 having more than 25,000 persons within the 7.8 miles
7 from the reactor.

8 DR. KRESS: And you used historical growth
9 data of population in that area to make that judgment?

10 MR. LEE: Yes. You know, in fact, we did
11 10 miles from the reactor, the largest community is
12 the town of Mineral, Virginia which has I believe a
13 population of like 424 persons, based on the 2000
14 census.

15 DR. POWERS: They don't have a problem.

16 MR. LEE: And so we did 7.8 miles
17 distance.

18 DR. KRESS: But this is intended to be
19 sort of a general question, not just questioning this
20 site. I don't see that it has any problem.

21 But, for example, would Indian Point meet
22 the requirements?

23 MR. LEE: I cannot really speak for Indian
24 Point, but the New York City is --

25 DR. KRESS: Well, there are some reactors

1 there. It must have met the requirements at one time.

2 MR. SCOTT: I don't think we are going to
3 be prepared to speak to that because, of course, we
4 haven't evaluated Indian Point.

5 DR. POWERS: I think Indian Point was
6 created before the regulation was.

7 DR. KRESS: Before the regulations were.

8 DR. BONACA: If I remember clearly, in
9 the early '80s, for plants under construction at that
10 time, that were in high population density locations,
11 they required a level 3 PRA, for the full consequence
12 analysis and the understanding of -- and I think that
13 Indian Point was subjected to that. Millstone 3 was
14 subjected to that.

15 DR. KRESS: Having a level 3 is one thing,
16 but having a level 3 that meets certain criteria.

17 DR. BONACA: Well, when the request was
18 made, it was pretty open-ended, but there were then a
19 lot of interactions during the late phase of
20 construction to minimize releases and to address the
21 HVAC systems, to address the --

22 DR. POWERS: I'm not sure how this relates
23 to ESP.

24 DR. BONACA: It doesn't, probably. I'm
25 trying to understand, however, some of the new designs

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1 that are coming in with support of PRA, not a level 3,
2 and a level 3 would apply only to the site, and that's
3 why I was asking these questions is I would like if
4 there is no requirement, I guess.

5 MR. SCOTT: I would say that, unless Jay
6 knows something different, I'm not aware of it. That
7 doesn't necessarily mean it doesn't exist.

8 DR. KRESS: Well, it seems interesting to
9 me that we are dealing with siting and level 3 PRA is
10 normally what one thinks of when we talk about siting
11 characteristics and interactions. But I don't see any
12 requirements or any calculations using level 3 in any
13 of the early site permits or in the rules.

14 It just seems strange to me.

15 MR. LEE: Well, we do address that aspect
16 in the EIS, environmental impact statement.

17 MR. SCOTT: Well, and we also address the
18 ability of the site to comply with the dose
19 consequence evaluation factors. It's not a PRA, but
20 it is a measure of the -- you combine an accident, a
21 design basis accident with this site, what sort of
22 dose is received off site, which I think is a related
23 subject to what you are talking about there, and that
24 is part of what we do. It's not a PRA, but it is an
25 assessment of the dose against -- I'm sorry,

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1 assessment of the site against radiological dose
2 consequence evaluation factors. And that is part of
3 ESP.

4 Next slide, please.

5 On what we were talking about, basically,
6 was with respect to site characteristics versus design
7 inputs. As I mentioned, we have given Dominion credit
8 for consideration of most severe natural phenomena to
9 allow them to support compliance demonstration at
10 combined license that they comply with general design
11 criterion two.

12 Dominion is concerned that the ESP should
13 not specify design bases because they always would
14 have the wherewithal to have a more conservative
15 design basis than the site characteristic might lead
16 them to have.

17 So they have said, and the staff agrees,
18 that site characteristics should serve as minimum or
19 conservative site-related design inputs, but are not
20 specific exclusive design criteria.

21 Next slide.

22 We also have identified a number of
23 examples involving interface between the early site
24 permit site and the design, which is intended, of
25 course, by the regulatory process to be the subject of

1 design for certification and for as-needed additional
2 review of combined license.

3 Examples of that are shown on this slide.
4 For example, potential interferences or interfaces
5 between new plants and plants that happen to be
6 located next door to the new plants.

7 We have a specific item regarding the
8 potential underground ultimate heat sink if one is
9 required in the presence of the water table that is
10 near the surface, which it is at this site.

11 And another example that we have
12 identified is the potential for frazil or anchor ice.
13 These are site-related items that don't clearly have
14 a site characteristic that we can identify and put in
15 the permit, and so we have been wrestling, the staff
16 has been wrestling with how best to deal with these
17 items, and a couple of them I will talk about here in
18 the open item discussion here in a few minutes.

19 Which brings us to future oriented items.
20 The ACRS staff indicated to us when we were talking
21 about planning for this meeting, this presentation,
22 that the committee and the subcommittee would like to
23 hear about the future oriented items that are in the
24 early site permit.

25 Of course, as an initial step on the road

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1 to licensing, there are items that are not resolved at
2 the ESP stage, and we have talked some about some of
3 those.

4 We divided, when we did the safety
5 evaluation report, these future oriented items into
6 the four classes you see there.

7 Open items, of course, are those that we
8 need additional information on before we can issue the
9 final safety evaluation report. So they are future
10 oriented near term.

11 DR. POWERS: Now in the version of your
12 SER that I was given, there is quite a list of open
13 items. About half, I would guess, fall legitimately
14 within the domain of interest of this committee --
15 some of them don't.

16 MR. SCOTT: Okay.

17 DR. POWERS: And whatnot. Is that still
18 the operative list, or is there a truncated list?

19 MR. SCOTT: What I did in drafting this
20 presentation was there are slides that follow that
21 discuss them.

22 I don't, frankly, know which ones you are
23 not interested in. You can let me know that and we'll
24 move on beyond them very quickly.

25 DR. POWERS: Uh-huh.

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1 MR. SCOTT: But I would propose to discuss
2 each of them briefly, at least to stimulate questions,
3 if you have any, on those particular items.

4 What I would propose to do here would be
5 to discuss the open items. The confirmatory items
6 regarding quality assurance, I don't think and had not
7 planned to discuss that further. The staff has done
8 a follow-on inspection on it, and believe it has been
9 adequately addressed.

10 The COL action items are -- I did not plan
11 to discuss them individually unless there were some
12 that were particularly --

13 DR. POWERS: My view is they were
14 interesting, but I wasn't -- I mean they are not
15 really germane to the data collection exercise we are
16 undergoing right now, unless somebody thinks that you
17 have miscategorized them.

18 MR. SCOTT: I'll give you a disclaimer on
19 that. We are currently considering, based on what we
20 get in response to the open items and some additional
21 considerations, we may end up recategorizing some of
22 those items.

23 DR. POWERS: Yes. And it's not terribly
24 surprising.

25 MR. SCOTT: Especially the first-of-a-kind

1 nature of this.

2 DR. POWERS: In my examination of your
3 permit conditions, most of them fell very logically
4 from the presentation either within the application or
5 within your assessment. Hence, we put a permit
6 condition here. I mean none of them struck me as
7 "God, why did they do this." But it's probably the
8 best explained thing in your SER is why you put permit
9 conditions on that.

10 I find that very transparent.

11 MR. SCOTT: Okay. Well, I appreciate
12 that. As I said, though, we are still discussing
13 those.

14 DR. POWERS: Sure.

15 MR. SCOTT: And trying to figure out how
16 they all fall out.

17 It sounds like what you are telling me is
18 we need to focus on the open items and you will tell
19 us which --

20 DR. POWERS: Well, I still want to
21 understand how you approach philosophically this
22 review. I still haven't asked you the prognostication
23 question. I was waiting for an appropriate slide to
24 do it on.

25 MR. SCOTT: Okay.

1 ~~DR. POWERS:~~ DR. POWERS: Yeah, it is very important
2 for me to understand how you approached it
3 philosophically. Your SER is fairly clear on the
4 factual assessment. It's understanding what underpins
5 that that I wanted to pursue a little further.

6 I also wanted to pursue a little further
7 the inability I have, taking the two documents, to
8 reproduce the quantitative, okay. I mean I can't
9 because I don't have everything that you have.

10 MR. SCOTT: Right.

11 DR. POWERS: I may not be able to because
12 I'm technically incapable of it, but right now I
13 derive some solace from the fact that I don't have all
14 the numbers I need in order to do it, and why is that
15 a correct thing to do?

16 MR. SCOTT: Why is what a correct thing to
17 do?

18 DR. POWERS: Why is not being able to
19 reproduce the quantitative between the two reports
20 okay?

21 MR. SCOTT: I guess I would answer that
22 generically that the application and its references
23 and the safety evaluation report and its references
24 should collectively provide the supporting information
25 needed for the --

1 DR. POWERS: I think they don't.

2 MR. SCOTT: Okay.

3 DR. POWERS: I think there is docketed
4 information that surely exists, but it's not pointed
5 out in the reports.

6 Now I could be wrong on that.

7 MR. SCOTT: Okay.

8 DR. POWERS: But --

9 MR. SCOTT: Can you give an example?

10 DR. POWERS: Just how you get the Chi over
11 Q ratios.

12 MR. SCOTT: Okay. We have, as it happens,
13 Jay Lee who can speak to that. Was there a specific
14 question on that, or do you want him to go through in
15 general how they came up with those?

16 DR. POWERS: No, I think they are very
17 explicit.

18 MR. SCOTT: Okay.

19 DR. POWERS: They said I used this Reg
20 Guide and I got these numbers.

21 MR. SCOTT: Right.

22 DR. POWERS: Okay. But when I go to that
23 Reg Guide, there is not the tables and numbers I need
24 to see if I would get those numbers.

25 MR. SCOTT: Okay, I misstated the

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1 reference person here. Brad Harvey has stepped up to
2 the microphone.

3 Brad, would you care to answer that?

4 MR. HARVEY: This is Brad Harvey with the
5 NOR staff.

6 The numbers, the Chi over Q, are
7 calculated from the licensee's hourly meteorological
8 data base using the computer program PAMAN, which
9 basis is Reg Guide 1.45.

10 The application was asked to provide a
11 copy of their hourly data base in an RAI that we
12 submitted, and indeed they have, so it is on the
13 docket as a public record.

14 DR. POWERS: Okay. Now if I read these
15 documents, would I know to ask you for that?

16 MR. HARVEY: For what, please?

17 DR. POWERS: That hourly data.

18 MR. HARVEY: I believe that there is a
19 record of the asking the RAI.

20 DR. POWERS: I didn't get your RAIs.

21 MR. SCOTT: Well, no, what Brad is saying
22 is, is in the safety evaluation report is basically a
23 summary of each RAI that is applicable, request for
24 additional information that is applicable. It says
25 the staff asked the applicant to provide X, and the

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1 applicant in its response provided Y. So you will
2 find that in there.

3 DR. POWERS: I will find that information?

4 MR. SCOTT: Yes.

5 MR. HARVEY: Basically you will have
6 trouble reproducing that particular one unless you had
7 the hourly data and the code to feed it into.

8 MR. SCOTT: Well, you won't see, of
9 course, the data table in the safety evaluation
10 report.

11 DR. POWERS: You know, I presume that I
12 can chase this all down if I know to chase it down.
13 The way I read the document -- and trust me, about
14 page number 1600, I began to lose track of page number
15 20, and whatnot. But, you know, I just sit there and
16 say, you know, here's this table of ratios. They
17 don't seem like they are unreasonable ratios to me,
18 but on the other hand, I don't know how they -- I
19 can't redo these ratios.

20 MR. SCOTT: I would say it is a good
21 comment that if we have not clearly stated in the SER
22 where the numbers came from, including a reference,
23 then we need to do that. So we will take a look at
24 that.

25 DR. POWERS: Now I need some assurance of

1 plausibility on the numbers.

2 MR. HARVEY: The applicant was asked to
3 provide a copy of at least the inputs to the computer
4 code, and the staff's actual output is also available.

5 MR. SCOTT: We should be able to provide
6 an ADAMS reference and get the document out and
7 provide it to the subcommittee. I don't see why we
8 can't do that, so we will do that.

9 DR. POWERS: Okay. Please continue.

10 MR. SCOTT: Okay. So slide 23 begins the
11 open items discussion. Would you like me to just
12 briefly discuss each of them, or would you like to
13 tell me to skip some that you are not interested in?

14 DR. POWERS: Let's go through a couple of
15 them and we'll see how we do.

16 MR. SCOTT: Take a shot. All right.

17 To begin with, item 2.1-1 -- this is not
18 a really great example, because it turns out it's a
19 legal issue.

20 DR. POWERS: Yeah, it's outside our frame
21 of interest. Let's get to the second one.

22 MR. SCOTT: Say no further. Okay.

23 Item 2.3-1, basic wind speed or fastest
24 mile. As noted on here, Dominion provided the 100 --
25 and we talked about historical data use -- the 100-

1 year return fastest mile value from an industry
2 standard that they selected.

3 DR. POWERS: Okay. Now here is my
4 prognostication question comes in.

5 MR. SCOTT: Okay.

6 DR. POWERS: Taking a historical record,
7 here's what over the last 100 years this is something
8 that you can use for the basic wind speed. Fastest
9 mile. I have got this entire body of meteorologists
10 swearing and be damned that the weather is changing;
11 that this historical record will not be useful in
12 prognosticating for the next 20 years.

13 I mean -- and there's not a word about it.

14 MR. SCOTT: Okay, Belkys, take us back to
15 slide 19, please.

16 DR. POWERS: No, I don't want slide 19.
17 You're going back to the general design criteria.

18 MR. SCOTT: Well, and I think it's fair to
19 state that that is the regulatory framework within
20 which we are operating.

21 DR. POWERS: Properly read, that says you
22 have to take into account the historical data. It
23 does not say that that is the only thing you can take
24 into account.

25 MR. SCOTT: That is certainly correct.

1 As I mentioned, when Dominion's folks were
2 up here, we have a process that involves looking at
3 historical data. In certain areas it also involves
4 future predictions that are a little more credible,
5 perhaps, such as population density.

6 In that process, we make decisions based
7 on the information available at the time, in this case
8 of the early site permit review. The applicant bears
9 the burden of providing enough margin such that that
10 information will remain valid for the time of the
11 early site permit, and if it turns out, let's say 20
12 years from now, Dominion elects to -- let's say they
13 receive an early site permit and 20 years from now --

14 DR. POWERS: I know where you are going on
15 this.

16 MR. SCOTT: Oh, okay.

17 DR. POWERS: I mean that's just what you
18 said.

19 MR. SCOTT: Yes, it is. It is that, that
20 if their information is no longer valid, then they
21 will not be able to get a combined license without
22 additional analysis.

23 DR. POWERS: I mean that seems like it's
24 the kind of a coward's way out, because in that case
25 you would say, well, don't do anything and when you

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1 come in with the COL, we'll check everything.

2 MR. SCOTT: It's not intended to be that
3 way. It's intended to say we look at the historical
4 record, we ask for margin. We expect margin. I
5 shouldn't say we ask for it; we expect margin. And if
6 the applicant fails to provide margin adequate, then -

7 -

8 DR. POWERS: Yeah, but that's where the
9 question of adequate comes in.

10 MR. SCOTT: Yes.

11 DR. POWERS: I mean your document doesn't
12 say, okay, here's how I assessed adequacy. I've got
13 this entire meteorological community ready to attest
14 the weather is changing -- the climate is changing,
15 not the weather. And based on that, and looking at
16 this literature, I think we need this kind of margin.
17 Your document does not say that.

18 MR. SCOTT: That's correct.

19 Brad, would you like to add some
20 perspective to this?

21 MR. HARVEY: Yeah, there's two points I
22 would like to bring up.

23 Number one -- and I would use the word, if
24 we go back to slide 23, Belkys, we are talking about
25 trying to define a basic wind speed as a site

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1 characteristic, and the commission has used 100-year
2 fastest mile wind speed value. And the 100-year
3 return is what I would focus on here. Because if you
4 go to the ASCE 702, which is the American Society of
5 Civil Engineers Structures, they define basic wind
6 speed as a 50-mile -- excuse me, 50-year return.

7 So there is already -- the staff is having
8 added additional --

9 DR. POWERS: That is not additional
10 margin. If you in fact look and see that everything
11 that constitutes the -- makes -- leads to this 100-
12 year return occurred in the last 40 years, which in
13 fact is what you will find.

14 MR. HARVEY: The industry standard has you
15 design to a 50 year. We have put margin by insisting
16 that they design to 100-year.

17 DR. POWERS: What I'm telling you is
18 you've got no margin when you did that.

19 MR. HARVEY: The margin is the difference
20 between the 50 and the 100-year.

21 DR. POWERS: If there was no high speed
22 wind in the first 50 years, it gave you nothing. And
23 if the winds in the next 50 years all get more intense
24 than the last 50 years, you in fact don't have any
25 margin at all.

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1 I mean that's the question, and yet your
2 document says not a word about this. I mean it's
3 remarkable in the sense that I can't think of anything
4 connected with this early site permit that has been
5 more in the public consciousness than the changing of
6 the climate.

7 MR. SCOTT: That's been fairly
8 controversial.

9 DR. POWERS: It's been fairly
10 controversial.

11 The part that is not controversial, it
12 seems to me, in my casual examination is nobody
13 contests the fact that the climate is changing; it's
14 only why it's changing that is contested.

15 MR. SCOTT: I would say that -- and I'm
16 not a meteorologist here, but I would say the climate
17 is constantly changing.

18 DR. POWERS: And I think some proponents
19 of climate change will agree to you exactly and say,
20 all we are looking at is a fluctuation that has been
21 persistent throughout history. Others say it is a
22 systematic change. But everybody says it's a change.
23 And yet your document says anything at all about this.
24 And so assessing margin, it's not clear you did it.

25 DR. APOSTOLAKIS: And the change will be

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1 significant in 20 years?

2 DR. POWERS: Well, I mean that's where, as
3 I read it, and I am at best an amateur here, and more
4 likely a dilettante, some come back and say, oh, yes,
5 we will get more frequent periods of high wind, but
6 because they are more frequent, they will be less
7 intense.

8 Others come back and say, ah, no, we will
9 get more intense and more. But the document is silent
10 on that. And I am asking why.

11 MR. SCOTT: Well, at one level it's
12 because the regulatory framework does not require
13 that. I know that is not, you know, a satisfying
14 answer.

15 DR. POWERS: It just changes the framework
16 of the question.

17 MR. SCOTT: I understand.

18 Brad?

19 MR. HARVEY: The other point I want to
20 make is that the numbers that we chose are out of
21 again an ASCE standard, which those standards are
22 constantly being updated based on what they see as
23 climatic change.

24 You mentioned the fact that we have seen
25 more recent hurricanes down in Florida. I would

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1 expect that that document in the future will probably
2 show that there will be a higher basic wind speed
3 specified for Florida.

4 DR. APOSTOLAKIS: But is the standard
5 intended to apply to structures that will be built 20
6 years into the future?

7 MR. HARVEY: I believe it is, yes.

8 DR. APOSTOLAKIS: Or is it current?

9 MR. HARVEY: I'm sure the lifetime of the
10 structures are being used to -- that this document is
11 being used to design is supposed to 40 years,
12 commercial building.

13 DR. APOSTOLAKIS: Does the standard
14 address the issues that Dr. Powers has raised?

15 MR. HARVEY: I have seen discussions in
16 some of these committees where they are looking into
17 that, yes. I do believe that has been and will be the
18 consideration of putting new standards together.

19 DR. APOSTOLAKIS: But there is nothing in
20 the standard that -- the committee may talk about it,
21 but --

22 MR. HARVEY: Well, you will see that
23 Florida has a much higher basic wind speed than
24 Virginia does, which reflects the occurrence of
25 hurricanes down there.

1 DR. APOSTOLAKIS: No, that's not change in
2 the future. That's a geographical change.

3 MR. SCOTT: Brad, what they are
4 specifically asking is does the -- do the standards
5 that were used by the applicant and the staff attempt
6 to forecast climatological data 20 years in the
7 future?

8 MR. HARVEY: I would say no, but on the
9 other hand, I would say there is margin beyond which
10 ordinarily industry uses it to design buildings that
11 we insist upon for our plants. So implicitly there is
12 margin in there.

13 It may not, you know, explicitly be
14 addressing the climatic change, but it will handle
15 that phenomenon to a certain extent.

16 DR. POWERS: But what we know is there is
17 margin if I were going to build a building in the last
18 hundred years. Okay. We do not know that there is
19 margin in the next 20 years.

20 MR. SCOTT: And again, we are not
21 authorizing anyone to build a nuclear power plant at
22 this stage. They must come in at combined license or
23 seek a construction permit under Part 50, and if,
24 let's say, they do that 20 years down the road, the
25 data has changed such that the criteria that are

1 specified in the early site permit are no longer
2 valid, then the issue can be raised again at combined
3 license.

4 DR. POWERS: We can all be thankful that
5 Professor Wallis is not here, because I think he would
6 have a cardiac arrest. These things get ossified into
7 these permits so badly that I'll be stunned if you
8 force a change here.

9 Let's go on. I understand where you're
10 standing.

11 MR. SCOTT: Okay. Item 2.3-2, snow pack
12 weight versus snow load. This is another
13 meteorological item.

14 We have a regulatory guide that provides
15 guidance on determining the weight of snow and ice on
16 safety-related structures.

17 In the process of doing this review, we
18 also -- what's the right word -- unearthed a branch
19 technical position that provides clarification on that
20 regulatory guide. As you can see here in the sub-
21 bullets, normal winter precipitation load should be
22 100-year snow pack. Extreme load should be the weight
23 of 100-year snow pack plus 48-hour probable maximum
24 winter precipitation.

25 We discussed this with the applicant.

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1 This is a situation where you have more than one site
2 characteristic that potentially could come together to
3 provide a minimum design basis input.

4 So what Dominion plans to do is to provide
5 100-year snow pack, 48-hour maximum snowfall, 48-hour
6 winter PMP, and then the COL applicant will need to
7 determine how to combine those for this particular
8 site.

9 DR. POWERS: Yeah. Didn't in fact in
10 their application they provide 24-hour?

11 MR. SCOTT: Twenty-four hour --

12 DR. POWERS: Maximum precipitation.

13 MR. SCOTT: I believe it was 48 hour.
14 Brad?

15 MR. HARVEY: That may have been for a
16 flooding purposes.

17 DR. POWERS: Maybe it was. You may be
18 right on that. I remember seeing a lot of 24-hour and
19 maximum snow pack data, but it gets fuzzy quickly.

20 Okay.

21 MR. SCOTT: All right. Next item. There
22 is an open item regarding a site characteristic to
23 assess the potential for freezing in the ultimate heat
24 sink.

25 Dominion plans to submit a site

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1 characteristic of accumulated degree days below
2 freezing to address this cocaine.

3 DR. POWERS: See, now here is where
4 prognostication in the future would just help them out
5 enormously.

6 MR. SCOTT: If you believe global warming.

7 DR. POWERS: Yeah, everything is getting
8 warmer.

9 MR. SCOTT: But I would still submit there
10 is some controversy there.

11 DR. APOSTOLAKIS: I can assure you,
12 nothing gets warmer in Boston.

13 (Laughter.)

14 DR. POWERS: And they're not building one
15 in Boston.

16 MR. SCOTT: We have had some discussions
17 with the applicant regarding their choice of weather
18 station for the data that's used and the methodology
19 for calculating this accumulated day characteristic.
20 We believe there is a path forward there that the
21 applicant can use.

22 The next item is the impact of the dry
23 cooling system, which I discussed earlier.

24 DR. KRESS: On the accumulated degree
25 days.

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1 MR. SCOTT: Yes.

2 DR. KRESS: Do those have to be
3 consecutive or can it be -- can you have below
4 freezing one day and above freezing the next, and
5 below the next, but you --

6 MR. SCOTT: Did you hear that, Brad?

7 DR. KRESS: How do they accumulate these?

8 MR. HARVEY: I'm not certain. I think
9 part of the issue is what is the methodology the staff
10 is using versus the applicant.

11 MR. SCOTT: Goutam Bagchi, would you like
12 to speak to that? Goutam is our hydrology reviewer,
13 but he has been working with Brad Harvey on the
14 meteorological -- certain parts of the meteorological
15 also.

16 MR. BAGCHI: The time window that one uses
17 to accumulate the degree days is not fixed, so our
18 contractor PNL looked at different time windows and
19 came up with an interval that gave us the highest
20 number of accumulated degree days.

21 DR. KRESS: It's an interval.

22 MR. BAGCHI: Sorry?

23 DR. KRESS: That means hot days offset
24 cold days.

25 MR. BAGCHI: Sometimes they do. In

1 November, when they started, some of the days offset
2 that, the cold days, yes.

3 DR. APOSTOLAKIS: Is that reasonable?

4 MR. BAGCHI: Why not? It's cumulative
5 degree days. What gives you the worst kind? They
6 looked at all the data year after year after year, and
7 came up with a particular date, and that curve is in
8 the DSCR.

9 And the applicant got 200 degree days and
10 we got 378 or something. We need to, you know,
11 understand each other's methods and processes, but we
12 did an independent calculation.

13 MR. SCOTT: Returning to item 2.3-4, there
14 is an open item regarding the impact of the dry
15 cooling system for Unit 4 on atmospheric temperature,
16 and Dominion plans to provide, in the absence of a
17 specific design for that dry cooling system, a
18 qualitative or semiquantitative assessment, and then
19 additional quantitative information will be needed at
20 combined license.

21 This is another case of flexibility
22 retained in a PPE, but it means that additional
23 information is needed at the COL.

24 Item 2.4-1 is coordinate reference system.
25 I don't think that one really needs to be talked

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1 about.

2 Item 2.4-2 has been an interesting one for
3 us. The applicant, as I mentioned earlier, plans to
4 at least attempt to use the discharge structure for
5 the Unit 3 and Unit 4 that were cancelled previously.
6 That structure or tunnel runs very close -- the
7 applicant has told us likely or possibly within one
8 foot of certain of the Unit 1 and 2 service water
9 piping that runs back and forth to the existing UHS
10 for Units 1 and 2.

11 And so we had an open item to basically
12 specify a minimum distance. Well, it turns out that
13 the minimum distance horizontally is zero because the
14 one would run under the other.

15 If they are able to use the existing
16 structure, then it shouldn't pose a problem, but if
17 for whatever reason they find they can't use the
18 existing structure, then the question is what then.
19 And there have been discussions about whether a
20 minimum vertical distance can be specified and, as you
21 can see down here, Dominion has told us they don't
22 believe it's feasible or necessary to specify a
23 minimum vertical separation distance.

24 They note that this is only one of many
25 possible examples of interferences that can and will

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1 be addressed at the construction stage, and they have
2 stated that 10 CFR Part 50, particularly 50.59, will
3 provide protection for the operating plant from any
4 activity nearby, and the ESP construction being an
5 example of that.

6 Now this item continues to see discussion
7 internally to the staff.

8 DR. POWERS: Why?

9 MR. SCOTT: Why are we continuing to
10 discuss it?

11 DR. POWERS: On the face, on the bald face
12 of it, I can hypothesize literally hundreds of
13 potential interferences between a new plant and an
14 existing plant.

15 MR. SCOTT: Yes.

16 DR. POWERS: I mean I could presumably
17 come up with a very imaginative reactor that would --
18 I mean that would go on ad nauseam. Why this one
19 attracts your attention in particular.

20 MR. SCOTT: Well, the short answer to that
21 is because this particular subject -- this is
22 hydrology. This particular subject matter is a
23 subject for early site permit, not per se this
24 interference issue, but hydrology and where the water
25 comes from, and where the water goes back to.

1 So it came up in that manner, but the
2 question you just asked is the same question the staff
3 is asking itself internally, is how does this shake
4 out with the fact that there are nuclear power plants
5 nearby, which is the case for all three of these early
6 site permit applications, and how do we deal with that
7 now at early site permit, when we are really all about
8 site here, and not about design and design
9 interferences.

10 You are asking the same question that we
11 are asking ourselves.

12 Item 2.4-3, impacts of low flow
13 conditions. Dominion intends to address a minimum
14 lake level or address low flow conditions in the lake
15 with minimum lake level, which is the same approach
16 they have taken for the existing North Anna Power
17 Station units.

18 We also had an open item for ice jam
19 formation and breakup, and as noted here, the
20 applicant intends to attempt to bound that impact, and
21 they believe they will be able to, based on the
22 previous evaluations they have already done of the
23 breach of upstream dams that could cause flooding in
24 Lake Anna.

25 2.4-5, minimum intake water temperature.

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1 There is, we believe, no clear quantitative site
2 characteristic that speaks to the vulnerability of the
3 plant to frazil ice.

4 Are you all familiar with the term frazil
5 ice?

6 DR. POWERS: Yes.

7 MR. SCOTT: Okay. So Dominion plans to
8 note in its application that frazil ice conditions
9 could occur at the site, and then at the combined
10 license stage, clearly the combined license applicant
11 would need to provide design measures that can deal
12 with the possibility.

13 We had a discussion with the applicant
14 regarding whether this information should be provided
15 at early site permit or not, but basically again the
16 early site permit is about the site, not the design.

17 DR. POWERS: In the applicant's
18 application, he defines criteria for the formation of
19 frazil ice involving temperature, cooling rate, and
20 turbulence levels. Do you agree with those criteria?

21 MR. SCOTT: Well, I'll ask my expert here
22 to speak to that.

23 Goutam. Did you understand the question,
24 Goutam?

25 MR. BAGCHI: I do. There are certain

1 conditions of operation during which those things are
2 not going to be realized, so we have come down to the
3 point that the site has conditions that could create
4 frazil ice.

5 DR. POWERS: And I think he agrees with
6 you that it's in principle possible to form frazil
7 ice. He argues that largely because of the turbulence
8 criterion, it never actually gets there.

9 MR. BAGCHI: Only by turbulence, the
10 frazil ice wouldn't go away is what I understand.
11 Their arguments included the possibility of other
12 plants running, including some warm water flow back
13 into the --

14 DR. POWERS: I mean it's more subtle than
15 that. He says when the other plants are running, I
16 never get the temperature criterion.

17 MR. BAGCHI: Right.

18 DR. POWERS: When they are not running and
19 it is possible to get the temperature criterion, I
20 don't have the turbulence.

21 That's my summary. I caution you --

22 MR. BAGCHI: Well, I have to take it back
23 with me, then. My understanding was that that by
24 itself is not going to preclude frazil ice formation
25 and anchor ice formation.

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1 DR. POWERS: At any rate, I just wondered
2 if you had agreed with the turbulence criterion.

3 MR. SCOTT: I would say that the applicant
4 has -- well --

5 MR. BAGCHI: Turbulence by itself is not
6 going to preclude it, is what my consultants have
7 concluded.

8 DR. POWERS: It's the lack of turbulence
9 that avoids the frazil ice. It's not stirring the
10 water up, and so it forms a coherent layer of ice
11 rather than suspended ice particles, and so he didn't
12 get the problem. Okay. And it was interesting. I
13 mean I found it fascinating. I did not have a -- the
14 applicant actually includes a reference, and I just
15 didn't have a chance to examine that reference, and so
16 I took the coward's way out and said, ah, I know the
17 staff has looked at this in extreme detail, checked
18 against elaborate experiments, and knows all about it,
19 right?

20 MR. BAGCHI: Sorry to disappoint you.

21 (Laughter.)

22 MR. SCOTT: Do we have anything else to
23 add to that, Goutam?

24 MR. BAGCHI: No.

25 MR. SCOTT: Okay. Let's see, 2.4-6,

1 another interface type question. Stability of the
2 underground ultimate heat sink against groundwater
3 pressure.

4 As I mentioned earlier in the
5 presentation, in parts of the site the water table is
6 near the surface, which could cause a lifting force on
7 an empty or partially full ultimate heat sink, and so
8 we have wrestled with what is the appropriate site
9 characteristic to deal with that possibility, and have
10 ended up concluding that we simply need to have a site
11 characteristic that states the groundwater elevation
12 and the combined license applicant will need to deal
13 with that groundwater elevation, if they choose to
14 have an underground UHS.

15 Item 2.4-7 speaks to correlating
16 groundwater level measurements with data from long-
17 term piezometers.

18 DR. POWERS: Meters based on the
19 piezoelectric effect; how about that?

20 (Laughter.)

21 MR. SCOTT: Works for me.

22 Dominion has stated that the short-term
23 and the longer term information do not correlate well
24 different purposes and locations for the information.

25 The staff has indicated they need to show

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1 that post-drought data that they have taken is not
2 anomalous. They used data from just at the tail end
3 of the 2001-2002 drought that was the driest period
4 for many years around.

5 DR. POWERS: I will point out that someone
6 from New Mexico does not believe there has ever been
7 a drought in Virginia.

8 (Laughter.)

9 MR. SCOTT: Well, you might get boaters on
10 Lake Anna to disagree with that.

11 DR. POWERS: They don't know what a
12 drought is.

13 MR. SCOTT: In any event, Dominion has
14 stated they are going to take additional data to
15 address that, and we have informed Dominion that they
16 are going to need to assess the impact on their
17 analysis of the lack of correlation between the long
18 and short-term data.

19 2.4-8, conservative hydraulic conductivity
20 is needed, and they plan to provide a more
21 conservative method to coming up with that.

22 They also, 2.4-9, plan to show that any
23 upward hydraulic gradient is a small fraction of the
24 horizontal flow and to bound its impact.

25 We have an open item, 2.4-10, that speaks

1 to providing additional seasonal data to support their
2 conclusions regarding hydraulic gradient. They plan
3 to provide that.

4 2.4-11 is an open item regarding on-site
5 measurements of adsorption and retention coefficients,
6 and the approach that the applicant intends to use to
7 address that open item is to use on-site measurements
8 of soil conditions and combine that with a look-up
9 table from the Environmental Protection Agency to
10 determine these coefficients.

11 DR. POWERS: I mean is there anything
12 wrong with that?

13 MR. SCOTT: The issue is that the
14 regulation says that site characteristics such as
15 various examples of them are based on on-site
16 measurements, and so in this case you have an on-site
17 measurement combined with a look-up table.

18 We have been advised by counsel that the
19 initial cut on that is that probably would be okay,
20 but they want to do some more looking at it.

21 DR. POWERS: Yeah, I mean it seems let
22 them argue with the language, but the fact is
23 somewhere or the other you are going to refer to
24 referential data in order to turn your on-site
25 measurements into something somebody can understand.

1 MR. SCOTT: Right.

2 DR. POWERS: I mean sooner or later that
3 is going to happen, no matter what.

4 MR. BAGCHI: The words in Part 100.2(c)
5 are very specific. You might want to read that.

6 MR. SCOTT: That's what I was referring
7 to. And that's what we are having our OGC support
8 folks look at.

9 Technically it seems like a reasonable --

10 DR. POWERS: Yeah, I mean you may come up
11 with a conclusion that it's better to change the words
12 than it is the imposition. I mean --

13 MR. SCOTT: I hope we don't have to go
14 there, but we have to do what makes sense.

15 DR. POWERS: It's not going to surprise me
16 if we run into those things.

17 MR. SCOTT: Well, right. And as a matter
18 of fact, of course, we are putting subpart (a) to Part
19 52 to use for the first time, and so a lot of things
20 have come up.

21 2.5-1, criteria for ground motion model
22 weighting and the model clusters for the EPRI 2003
23 ground motion evaluation. As Dominion noted in their
24 presentation to you this afternoon, they have
25 responded to this item, but we have certain questions

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1 regarding it, which you see in the sub-bullets there.
2 And so we are going to need to interact with them
3 further to identify how to move forward with this
4 item.

5 This is the one where Gene Grecheck
6 referred to this is an industry study and EPRI
7 methodology, and we are questioning details of that
8 methodology. Staff's position on that is that we need
9 to have confidence in the methodology, and we need
10 this information to have that confidence. And, no,
11 the applicant did not generate it, but their
12 application is before us.

13 DR. POWERS: It doesn't matter, if it's
14 not an approved methodology, it's their obligation to
15 defend it.

16 MR. SCOTT: Right.

17 2.5-2, incorporate site-specific geologic
18 properties and their uncertainties into the
19 determination of the safe shutdown earthquake. They
20 plan to determine -- the applicant plans to determine
21 this SSE at a hypothetical rock outcrop consistent
22 with NRC guidance, and to determine the transfer
23 function from that.

24 They have described their proposed method
25 to us and the staff has no questions on it. This is

1 an item that we are not actually going to get the end
2 result until the end of the month, so we'll see when
3 it comes in.

4 On slide 32 are lots of open items, and
5 there's kind of a history on these. I don't know how
6 interested you are in getting into them individually.

7 There are about --

8 DR. POWERS: 13.3-4.

9 MR. SCOTT: 13.3-4. Reliance on DOE for
10 plume tracking. Okay. Let me speak briefly to how we
11 got where we are with these.

12 There were a series of requests for
13 additional information that spoke to off-site
14 emergency planning issues. The applicant provided
15 information to respond to them, but after the due date
16 for addressing that information in the safety
17 evaluation report that we just put out in December.

18 So all those items you see in front of
19 you, they have responded to, and the staff has no
20 additional questions on them. But it sounds like the
21 ACRS does have a question on one of them.

22 DR. POWERS: Yeah, 13.3-4, what is it?

23 MR. SCOTT: Bruce Musico, our EP person,
24 come on down. Bruce is our lead reviewer for
25 emergency planning, and I will ask him to respond to

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1 that question.

2 DR. POWERS: Thank you.

3 MR. MUSICO: Bruce Musico.

4 These questions were put together jointly
5 with FEMA, the Federal Emergency Management Agency.
6 This one in particular reflects some criteria in
7 supplement 2 to NUREG 0654, which is our guidance
8 document that we are using to review the application.

9 The specific criteria in sup 2 asks for a
10 description of how technical resources will be called
11 in to assist during an accident, during an emergency.
12 And what we saw in the application and reflected in
13 both the North Anna emergency plan and the state and
14 local emergency plans were descriptions of how they
15 would notify and incorporate Federal resources for
16 radiological assessment.

17 This particular question did come from
18 FEMA in that they were looking for a little more
19 detail, and we are currently evaluating the response
20 that we got.

21 MR. SCOTT: Does that answer your
22 question?

23 DR. POWERS: No.

24 MR. SCOTT: Okay. Rephrase, please.

25 DR. POWERS: Are they using DOE -- are

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1 they going to call up DOE and say track this plume
2 that we are releasing from our plant?

3 MR. MUSICO: They could. They could.

4 DR. POWERS: That's ridiculous.

5 MR. MUSICO: What they're doing here, what
6 we're asking for in the guidance is a description of
7 potential resources that could be available. It
8 doesn't mean they would need those resources, but ones
9 that are out there that could be available and relied
10 upon. Federal resources to supplement the state and
11 the applicant.

12 MR. SCOTT: Is this typical for off-site
13 emergency plans?

14 MR. MUSICO: Yes. Yes, it is.

15 MR. SCOTT: And we should point out here
16 that the emergency planning, the off-site emergency
17 planning information that Dominion has provided us is
18 based on their existing emergency plan for North Anna
19 Power Station.

20 MR. MUSICO: And we have copies of
21 supplement 2 that I brought up, and you can see the
22 exact language which asks for a description of this.

23 DR. SIEBER: Is the site in Orange County?

24 MR. MUSICO: Orange County?

25 DR. SIEBER: Yeah.

1 MR. SCOTT: Partly -- well, no, the site -

2 -

3 DR. SIEBER: I thought the site was in
4 Louisa County.

5 MR. SCOTT: Yeah, the 10-mile --

6 MR. MUSICO: Yeah, Orange County makes up
7 part of the 10-mile emergency planning zone.

8 DR. SIEBER: Okay. But the site is not in
9 Orange County?

10 MR. SCOTT: No.

11 MR. MUSICO: I think it's in Louisa
12 County, yes.

13 DR. SIEBER: And so you would be relying
14 on Louisa County emergency personnel as the prime
15 responding local agency as opposed to Orange County?

16 MR. MUSICO: You have to --

17 MR. SCOTT: Orange County has a role.

18 MR. MUSICO: Yes. Yes. You have to look
19 at the specific roles of the local or county
20 resources. You've got the state resources that are
21 above them, and then if necessary, you go to certain
22 Federal resources.

23 For purposes of North Anna, the counties
24 depend primarily to the state resources as far as
25 general radiological emergency assessment and

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1 response. If the state is overwhelmed in their
2 ability to analyze the accident, they could go to the
3 Federal resources and ask for additional resources,
4 additional help.

5 DR. SIEBER: Well, plume tracking and
6 analysis of data is the licensee's responsibility, is
7 it not?

8 MR. MUSICO: In part, yes, it is. In
9 part. And the licensee has its own capabilities to
10 perform some of that function, but from an off-site
11 standpoint, the state has a responsibility as well as
12 the counties to provide that assessment in
13 coordination with the site, if necessary.

14 DR. SIEBER: The licensee collects -- does
15 surveys, tracks the plume, collects data, analyzes it,
16 and provides advice, basically, to the state. Now it
17 is incumbent upon the state, depending on how the
18 state is set up, since the state and counties are not
19 licensees, to assure that information they get from
20 licensees properly represents the actual situation.

21 MR. MUSICO: That's correct.

22 DR. SIEBER: So that they can make a
23 decision based on the licensee's advice. Okay.
24 That's a little bit different than what I read in this
25 slide.

1 MR. SCOTT: Well, these are shorthand.

2 MR. MUSICO: Yeah. The state has its own
3 capabilities to perform a lot of the work, and to a
4 great extent they would come in and confirm the work
5 that's done by the part of the licensee as far as
6 determining the scope and magnitude of any release.

7 The state, in addition to verifying what
8 the licensee is telling them, they also supplement the
9 resources of the licensees to respond to the accident.

10 DR. POWERS: Let me ask philosophically
11 here a question. You've got a site with two reactors
12 on it that have acceptable emergency planning
13 capabilities. Suppose the applicant came back and
14 said, okay, in answer to your questions, we're going
15 to do the same thing for these we do with the existing
16 plants, or mutatis mutandi, period. One sentence.
17 Why wouldn't that be perfectly adequate?

18 MR. MUSICO: First of all, we have a
19 guidance document that gives us criteria to evaluate
20 the application against.

21 To a great extent, the response and the
22 descriptions that they would provide, which they have
23 to provide in the application, are exactly the same
24 for the existing plants as well as any proposed new
25 plants at the site.

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1 MR. SCOTT: But there are three subject
2 areas they need to address, right, which is -- what
3 were the three times?

4 MR. MUSICO: Well, the three basic
5 components -- and supplement 2 makes that clear --
6 they need to identify significant impediments to
7 development of emergency plans.

8 You've got three different ones --

9 MR. SCOTT: What I was getting at and what
10 I think he's getting at is if you're going to
11 incorporate an existing plan, you need to show that
12 it's --

13 MR. MUSICO: Up to date?

14 MR. SCOTT: Up to date, applicable to the
15 existing site.

16 MR. SCOTT: And?

17 MR. MUSICO: You help me.

18 MR. SCOTT: If I knew it off the cuff, I
19 wouldn't have asked you. Well, one of them is
20 escaping us.

21 There are certain criteria that you need
22 to go through to apply the existing information. The
23 staff has stated, and actually use of existing
24 information was a subject that the commission found of
25 concern prior to the review of these applications, and

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1 so it is reflected in RS-002.

2 In general, use of an existing plan does
3 not require a detailed staff look at that plan. But
4 we do have to have -- we do have to make sure that it
5 is up to date and applicable to the site, and whatever
6 that third criterion is that Bruce and I can't bring
7 up right at the moment. And that's the way we
8 approach those.

9 DR. POWERS: You're delving in what are
10 the capabilities of the hospital and the emergency
11 services. I mean what I'm wrestling with is why do
12 that for this?

13 MR. SCOTT: Say again?

14 DR. POWERS: Why do that for this? It's
15 all going to change between now and the time they put
16 up a new plant there, anyway. You're going to have to
17 look at it again when the new plant comes up.

18 MR. SCOTT: That's a valid point and it's
19 a lesson learned that we have for these initial
20 reviews.

21 DR. POWERS: Yeah, it seems to me that I
22 would look at this real hard and say am I just
23 destroying trees for no particular purpose.

24 MR. SCOTT: We are looking at this hard;
25 have looked at it hard. It is a lesson learned.

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1 DR. POWERS: Yeah, I agree with you, I
2 would look at this one real hard, because --

3 DR. SIEBER: On the other hand, there's a
4 value to precedent, so whatever you do now,
5 particularly with existing plants, allows for easier
6 establishment of extended capability with political
7 subdivisions, it seems to me.

8 DR. POWERS: Well, I think I would agree
9 with you, Jack, if we were talking about a greenfield
10 site here.

11 DR. SIEBER: Yeah.

12 DR. POWERS: We are talking about a
13 situation where in principle, the emergency plan is
14 regularly and continuously examined, scrutinized,
15 checked, and whatnot, and continues to meet all
16 regulatory requirements, and a statement to the effect
17 that we are not going to undo this or change this with
18 good, sound reason whenever we build a plant here.
19 Otherwise, it's going to look the same would seem to
20 be enough.

21 DR. SIEBER: I agree with you.

22 MR. SCOTT: Next slide, Belkys, 33.

23 There are certain other emergency planning
24 items that are open. There is an open item regarding
25 the adequacy of the TSC and the EOF and the OSC, and

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1 basically to achieve this major feature, the applicant
2 would need to provide design type information that
3 they do not plan to provide, so they have indicated to
4 us they are going to withdraw the request for this
5 particular major feature.

6 And we have asked for additional
7 information on their evacuation time estimate. Again,
8 they reference an existing evacuation time estimate.
9 Staff has a number of questions on the details of that
10 plan, and Dominion is reviewing the document against
11 the staff questions and plans to provide additional
12 information.

13 Okay, that's all of the open items.

14 Now I have a slide here, 34, that
15 identifies what we are trying to do with COL action
16 items, which I don't know whether you would find of
17 interest discussing those. I think I heard you would
18 not.

19 DR. POWERS: Well, let me just check with
20 the members. Do people want to go through this? I
21 don't find this terribly pertinent.

22 DR. SIEBER: It will be dealt with again.

23 DR. POWERS: Yeah. I mean we're going to
24 see this all again, and I didn't find them -- I mean
25 none of them rocked my world here.

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1 MR. SCOTT: Do you want to discuss the
2 permit conditions individually?

3 DR. POWERS: I will again survey the
4 members. I myself, when I went through and cross-
5 checked, and by the way, I did not cross-check every
6 one of them, but I got a lot of them. You know, in
7 general, in your SER you had big bold letters.

8 MR. SCOTT: Right.

9 DR. POWERS: A condition, and if you read
10 the paragraph ahead of it, okay, I understand this.
11 I mean in general I mean the one that springs promptly
12 to mind is that the guy said, oh, we backfilled with
13 the existing saprolite and found that didn't work
14 worth a damn, so we won't do that in the future, and
15 you guys said, okay, conditional licenses, don't do
16 that in the future.

17 I mean it seemed very logical and
18 transparent.

19 DR. SHACK: Well, which ones does Dominion
20 have technical concerns with?

21 DR. POWERS: Good point.

22 MR. SCOTT: Oh. Dominion has concerns
23 with the -- the short answer is we are still
24 discussing this with Dominion, and we are not going to
25 be able to tell you today which particular ones they -

1 - as they noted, they think some of them probably
2 would better -- a COL action item might better be a
3 permit condition or neither of the above.

4 DR. SHACK: Oh, well, it's not really a
5 technical concern then, it's a --

6 MR. SCOTT: There may be some that they
7 have technical concerns with, but I am not going to be
8 prepared to discuss those. Gene wants to do that.

9 MR. GRECHECK: Without going through them
10 in specificity, I think in a few of them, the -- it
11 was the same issue that we heard discussed before as
12 to whether it is a site characteristic or a design
13 input, and in some cases there is something specified
14 that says this is a condition, and we are saying,
15 well, we recognize the reason that you did that, but
16 there may be other ways to deal with the technical
17 issue other than establishing some sort of a design
18 input. So I think that's the kind of discussions that
19 we are having here.

20 DR. SIEBER: Perhaps while the licensee is
21 available to help me a little bit, it seemed to me
22 from the geography of the North Anna site, that Lake
23 Anna, the level that it's controlled by dams, is that
24 correct --

25 MR. SCOTT: A dam, yes.

1 DR. SIEBER: A dam, okay.

2 MR. SCOTT: Yes.

3 DR. SIEBER: And so it's not like an open,
4 free running system. There's the -- the lake level
5 has some controls on it, and once you get to the
6 minimum level, it's basically by evaporation that the
7 level gets below that; is that correct? For an
8 ultimate heat sink?

9 MR. SCOTT: The ultimate heat sink is not
10 the lake.

11 MR. GRECHECK: The lake is never used as
12 an ultimate heat sink, including for the existing
13 units.

14 DR. SIEBER: Okay.

15 MR. GRECHECK: The lake is there only for
16 condenser cooling and for makeup water purposes. But
17 your question about the level, the lake's major loss
18 is evaporative losses, and there are a number of
19 inputs of streams coming into the lake, and then you
20 have a discharge rate at the dam.

21 There is a regulated discharge rate that
22 we need to maintain for the purposes of water usage
23 downstream, and there is also some requirements that
24 the state has imposed that if the lake level drops
25 below a certain level, then we need to reduce the

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1 discharge rate at the dam.

2 Now the reason that this has become
3 interesting is that, as was mentioned in the 2002-2003
4 timeframe, there was a major drought in Virginia. The
5 discharge rate was reduced to its minimum level, and
6 we saw lake level dropping below levels that we had
7 seen before, because there was so little input coming
8 into it.

9 DR. SIEBER: Does Dominion have control
10 over the discharge flow rate and the operation of the
11 dam?

12 MR. GRECHECK: The dam belongs to
13 Dominion, and we do control it.

14 DR. SIEBER: So you are measuring flow
15 with a weir, I take it?

16 MR. GRECHECK: Yes.

17 DR. SIEBER: Thank you.

18 MR. SCOTT: Any other questions on the
19 open items or permit conditions?

20 I would suggest we skip to slide 40 then,
21 Belkys.

22 The safety evaluation report that we
23 published in December, of course, contains a number of
24 open items and in those sections that contain open
25 items, we have not reached a conclusion regarding the

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1 adequacy of the information provided therein.

2 In a number of other sections, however,
3 there are not open items, and so you will see on this
4 slide and the ones that follow some conclusions that
5 we have reached at this stage.

6 For example, the applicant, we believe,
7 has provided appropriate quality assurance measures
8 equivalent to those in 10 CFR 50, Appendix B.
9 Appendix B does not explicitly apply to an ESP, but we
10 believe that measures are needed and that Dominion has
11 provided them.

12 Site characteristics are such that
13 adequate security plans and measures can be developed,
14 which is largely a function of both the topography and
15 the amount of land they have available, and we believe
16 they have adequate site to support security measures,
17 which is the bar that they need -- the hurdle they
18 need to pass over at early site permit.

19 DR. POWERS: And the committee has
20 explicitly excluded that from our review.

21 MR. SCOTT: Okay. Slide 41. Additional
22 conclusions from the individual sections.

23 We talked about population center
24 distance. Jay Lee referred to that, and the criteria
25 regarding population density are met for this site.

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1 The applicant has established appropriate
2 atmospheric dispersion characteristics to support
3 radiological calculations. We talked about that as
4 well.

5 Based on their use of plant parameter
6 envelope and their choice of two representative
7 designs to do dose consequence analyses, the site
8 meets the criteria in 10 CFR 50.34(a)(1).

9 Of course, when an actual design comes in
10 at combined license, then we will need to compare the
11 release characteristics with those that are assumed,
12 which are PPE at the ESP stage.

13 DR. KRESS: Would the proposed PPE allow
14 the current plant to be built there, like the
15 Westinghouses or the GEs?

16 MR. SCOTT: By current plant, you mean one
17 that is an older design but currently licensed? Or --
18 okay, I --

19 DR. KRESS: Not one of the advanced
20 plants.

21 MR. SCOTT: Yeah, right, something like --
22 would it meet the dose consequence criteria in
23 50.34(a)(1)? I assume -- I'm going to make an
24 assumption here that since Part 50 applies to the
25 existing plants, that that would be the case. But it

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1 This is not a question we asked.

2 Jay, you want to speak to that?

3 MR. LEE: Yeah. This is Jay Lee again,
4 NRR staff.

5 Yes, they do meet, could have been an
6 operating regulation, but we had 1 and 2. Either they
7 meet 10 CFR 50.34(a)(1) criteria or the Part 100 dose
8 criteria. If they still use TID source term, they
9 have to meet the Part 100 subpart (a). But if they
10 converted their design basis to the alternative source
11 term, I don't remember now whether North Anna
12 converted or not. If they did convert, they must meet
13 10 CFR 50.34(a)(1), those criteria, which is 25 rem.

14 DR. KRESS: In the policy statement on
15 advanced reactors, there is a statement, I think, that
16 says there is an expectation of a higher level of
17 safety for new plants. It doesn't to be addressed
18 here.

19 MR. SCOTT: Well, the compliance of the
20 site with the dose consequence evaluation factors was
21 based on use of newer designs, those that are -- and
22 Laura corrected me on that, either certified or in the
23 certification process.

24 DR. KRESS: But what I'm saying is that I
25 think this site, when approved, you could build a

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1 Westinghouse large dry PWR or a GE existing BWR on
2 that site, based on this -- it wouldn't exclude those.

3 MR. SCOTT: No, and I don't think that's
4 the role of early site permit. The role of early site
5 permit is to say is this site suitable for
6 construction and operation of a nuclear power plant,
7 and if it will support construction and operation of
8 an advanced design as well as construction and
9 operation of an older design, then it presumably is a
10 good site.

11 I just don't think that --

12 DR. KRESS: Well, that's what I'm saying
13 is it doesn't seem to address this expectation for a
14 higher level of safety for new plants.

15 MR. SCOTT: The only way that -- I guess
16 I can answer that on two levels.

17 One level is that the requirement does
18 apply to both newer and older plants, so I guess if
19 you could say the requirement in Part 52 could have
20 been something different than what it is now, it might
21 have addressed what you're talking about.

22 DR. KRESS: My point is there is no
23 criteria in here at all that says you cannot build an
24 existing current plant there.

25 MS. DUDES: Mike, excuse me.

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1 I think you are absolutely right, Dr.
2 Kress. The advanced reactor policy statement focuses
3 on the vendors and the designs and doesn't really talk
4 about the siting criteria, and so you are correct,
5 with the early site permit as issued or as is proposed
6 to be issued, you could put an existing plant on
7 there.

8 DR. KRESS: Doesn't that bother you guys
9 at all?

10 MS. DUDES: Well, the advanced reactor
11 policy statement is a policy statement. We use the
12 philosophy and the concepts in that to do
13 preapplication with vendors and to focus in on our
14 design reviews. I think it is an expectation that we
15 will be using one of the more advanced designs for
16 these ESP sites. But --

17 DR. KRESS: Well, I think it's probably
18 true, but --

19 MS. DUDES: But for the siting reviews --
20 yeah, we are really focusing -- I mean it's focusing
21 on having an enhanced safety within the design. The
22 site -- we have a parameter envelope and --

23 DR. KRESS: Well, let me put it another
24 way. If this applicant comes down to the COL stage
25 and says, well, we've decided we want to put a large

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1 dry Westinghouse like we have somewhere else,
2 subatmospheric Westinghouse like we already have on
3 the plant site -- would you say no?

4 MR. LEE: Can I try?

5 No, we will not say that so long as they
6 meet -- so long as they meet 10 CFR --

7 DR. KRESS: Of course they're going to
8 meet 10 CFR. They've already got two plants just like
9 it that meet it.

10 MS. DUDES: I don't think we would say no,
11 but I think it's worth further discussion.

12 DR. POWERS: The more I look at advanced
13 designs, the more I like the Westinghouse.

14 DR. KRESS: I think there's a missing
15 component here.

16 MR. SCOTT: It's fair to state that we did
17 not -- that the NRC did not in subpart (a) to Part 52
18 attempt to codify what you are talking about.

19 DR. SIEBER: The structure of the rules
20 doesn't address this point, and so if a licensee
21 wanted to build another plant, you'd use the set of
22 rules that you have or get busy on a rulemaking.

23 MS. DUDES: Right. Absolutely.

24 MR. SCOTT: And actually the policy
25 statement that he's referring to, Laura, when does

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1 that date back to, do you recall?

2 MS. DUDES: The first one was in the
3 1980s.

4 MR. SCOTT: Okay, so more or less about
5 the same time that Part 52 was --

6 MS. DUDES: Yeah, actually the policy
7 statement precludes Part 52, and that's how you got
8 the PRAs and severe accidents incorporated into the
9 design certification portion of Part 52. So the
10 policy statement set the stage for what was to come
11 with the advanced designs. And at that time an
12 advanced design was I think considered an ABWR or an
13 evolutionary design.

14 So as we move forward, the designs are
15 becoming -- are far more advanced than what was
16 expected in the timeframe that that came out.

17 DR. BONACA: In this case, clearly Mineral
18 has very little population. But assume that this were
19 a site with a very large population around it. Would
20 this early site application somehow constrain the
21 implementation of a power plant there?

22 MR. SCOTT: Well, again, we have criteria
23 by which we judge population density, and if a site
24 did not meet those criteria, then we have follow-on
25 actions to deal with that.

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1 DR. POWERS: It is an item of historical
2 interest that you have those because of complaint from
3 the ACRS. A large population center is a requirement
4 imposed by the ACRS. Or requested. Or requested by
5 the ACRS.

6 MR. SCOTT: Next slide. The other --

7 DR. APOSTOLAKIS: Coming back to what Dr.
8 Kress said, when the commission says we have an
9 expectation that something will happen, can you really
10 put that in the regulations?

11 MR. SCOTT: We certainly --

12 DR. APOSTOLAKIS: It's not an expectation
13 if you put it in the regulations.

14 MR. SCOTT: It would be converted to a
15 requirement if it's in the regulation.

16 DR. APOSTOLAKIS: Yeah, but that's not
17 what the commission intended. If they wanted the
18 requirement, they would direct the staff to do it. So
19 I don't know how you do that.

20 DR. POWERS: You can't. I mean I think
21 the commission deliberately did not want to put
22 requirements in. They said it was an expectation.

23 DR. APOSTOLAKIS: It was something that
24 was encouraged in the industry to improve safety, but
25 they didn't want to --

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1 DR. POWERS: Make it a requirement, no.

2 DR. APOSTOLAKIS: So I don't know how the
3 staff could come back and say we don't approve this
4 because it doesn't meet the expectations of the
5 commission.

6 MR. SCOTT: We can't within the regulatory
7 framework that's there.

8 DR. APOSTOLAKIS: So it's an issue there.

9 DR. POWERS: I think the commission itself
10 could say no, we don't do it, but I don't think the
11 staff can.

12 DR. APOSTOLAKIS: Well, even the
13 commission can say --

14 DR. POWERS: I think they would have to
15 explain it to a magistrate of some sort.

16 MR. SCOTT: Let's not go there.

17 Final conclusion here, potential hazards
18 associated with nearby transportation routes,
19 industrial or military facilities do not pose undue
20 risk to a facility or nuclear plant that might be
21 constructed on this site. There is very little in the
22 way of nearby hazards regarding the North Anna site.

23 DR. APOSTOLAKIS: Just a -- maybe it was
24 already in the thing and I missed it. You are doing
25 this, coming back to the safe shutdown earthquake.

1 This is now, you know, using the latest approaches and
2 using the spectra frequencies and so on.

3 Now the two units that are already on
4 site, were they licensed using these methods?

5 MR. SCOTT: Cliff, take it away.

6 MR. MUNSON: Actually we are wrestling
7 with this issue ourselves. The SSE for the early site
8 permit is much higher than existing SSEs for the two
9 units.

10 DR. APOSTOLAKIS: What is the SSE for the
11 existing units?

12 MR. MUNSON: It's -- I believe it's .15 g.

13 DR. APOSTOLAKIS: So, you see, for those,
14 you can give me the peak ground acceleration, right,
15 .15 g?

16 MR. MUNSON: It's because it's a standard
17 shape, anchored at a peak acceleration.

18 DR. APOSTOLAKIS: Right. We don't do that
19 anymore.

20 MR. MUNSON: We don't do that anymore.
21 They could do that. They could have selected a
22 standard shaped envelope, their low frequency and high
23 frequency spectra, and said this is our SSE. But they
24 didn't do that. They didn't elect to choose that.

25 DR. APOSTOLAKIS: Can you infer, though,

1 from what they did what the equivalent SSE and the
2 conventional methods would be?

3 MR. MUNSON: Well, the shape is entirely
4 different. I mean we can pick off a peak acceleration
5 from their ESP SSE.

6 DR. APOSTOLAKIS: But you said earlier
7 that the requirement now is much more stringent;
8 right, for the new reactors? Somehow you have reached
9 that conclusion.

10 MR. MUNSON: The old criteria was a
11 deterministic approach, where you pick one earthquake,
12 the maximum credible earthquake, and you calculate
13 the ground motion.

14 DR. APOSTOLAKIS: This is how you do it?

15 MR. MUNSON: You calculate --

16 DR. APOSTOLAKIS: Look at the results. So
17 the existing units have a .15 g peak ground
18 acceleration SSE?

19 MR. MUNSON: Right.

20 DR. APOSTOLAKIS: Then the new units will
21 have the curve that you show in this area, that Mike
22 showed us? By looking at those two, the .15 g and the
23 curve, how did you conclude that the requirements for
24 the new reactors will be more conservative?

25 MR. MUNSON: Well, the new approach is a

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1 probabilistic approach that considers all seismic
2 sources in the region, in the area, not just one
3 maximum credible earthquake. So we believe that the
4 '97 rule change, where we had 100.23 over old Appendix
5 A, Part 100, was an improvement. They could have
6 still done the old deterministic approach with certain
7 improvements, but now we are recommending that they
8 use this probabilistic approach because it considers
9 all sources, and we get a more realistic earthquake.

10 DR. APOSTOLAKIS: More realistic is not
11 necessarily more conservative.

12 MR. MUNSON: The --

13 DR. APOSTOLAKIS: In fact, it usually
14 isn't.

15 MR. MUNSON: The earthquake for the site
16 hasn't changed. The earthquake that we considered a
17 .15 g is still a magnitude 5-1/2 at 20 kilometers.
18 That is still the same earthquake that they came up
19 with doing this new method. It's the ground motion
20 estimate from that earthquake that has changed.

21 DR. APOSTOLAKIS: But that is what is
22 controlling the cost of the facility?

23 MR. MUNSON: That's controlling the SSE.
24 Right.

25 DR. APOSTOLAKIS: And ultimately the cost.

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1 MR. MUNSON: So it's the same earthquake,
2 it's just different ground motion estimates.

3 DR. APOSTOLAKIS: Right. And what I'm
4 asking is, is there any way you can derive a
5 representative SSE in terms of g, peak ground
6 acceleration, from the curve that we saw so that we
7 will have a better idea of how more stringent the new
8 requirements are?

9 If you told me, for example, the curves
10 that you saw earlier correspond to a .3 g --

11 MR. MUNSON: Right. They do roughly
12 correspond to that in the low frequency. Yes, yes.

13 DR. APOSTOLAKIS: So that is an
14 interesting question, is it not? Thank you very much,
15 yes.

16 MR. BAGCHI: We did IEEE. We did --

17 DR. APOSTOLAKIS: Oh, you mean they also
18 passed even if it's --

19 MR. BAGCHI: Yes, sir.

20 DR. APOSTOLAKIS: So what does that tell
21 us now? Where does that leave us?

22 MR. BAGCHI: It says that those plants
23 which have not --

24 DR. APOSTOLAKIS: So the new plants then,
25 if the requirement is .3 g, presumably you will be

1 able to pass .45 g?

2 DR. POWERS: Yes.

3 MR. BAGCHI: Well, more than likely, .5 g.

4 DR. APOSTOLAKIS: Well, why are they
5 spending all this money?

6 MR. BAGCHI: No, .5 g, because the
7 advanced reactors require a value of 1.67 times the
8 SSE.

9 DR. APOSTOLAKIS: First of all, is that
10 answering part of Dr. Kress's question?

11 MR. BAGCHI: I don't know.

12 DR. APOSTOLAKIS: It seems to me this is
13 more safe now.

14 MR. BAGCHI: As far as the earthquake it
15 is; no question about that.

16 DR. APOSTOLAKIS: But what questions are
17 you starting with then?

18 MR. MUNSON: We are looking at the
19 existing units in terms of what does the implication -
20 - what is the implication of this new information on
21 seismic for the existing units? We are looking at
22 that right now.

23 DR. APOSTOLAKIS: Well, I mean I
24 appreciate the answer they gave us. I'm still not
25 sure what that means in terms of -- I mean are we

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1 lucky that we were so conservative in the past?

2 DR. SHACK: Well, no, is it a difference
3 between design basis and the IEEE? That is, if you
4 look at it from the IEEE point of view, it's okay.
5 IPEEE. So in a risk point of view, it's okay, but you
6 have a design basis question; is that the issue we are
7 really addressing here? Yes.

8 DR. APOSTOLAKIS: Okay. Okay. So there
9 are some questions. And they will be answered in the
10 context of this activity, or --

11 MR. MUNSON: No, they would be addressed
12 in terms of -- or considering whether to ask the
13 applicant whether they -- a backfit would be
14 necessary.

15 MR. SCOTT: Applicant?

16 MR. MUNSON: Or the utility. Licensee.
17 Sorry.

18 DR. APOSTOLAKIS: To ask them what?
19 Whether to backfit? I mean do we ask the licensees
20 whether a backfit is required?

21 MR. MUNSON: No, we are not asking them,
22 we're exploring this issue.

23 DR. POWERS: Interesting word.

24 DR. APOSTOLAKIS: I'm confused, but --

25 MS. DUDES: I think we're getting, in

1 terms of operating reactors and the ESP, I don't want
2 to get too far along, because I'm not sure how they
3 are handling that generically, and I don't think we
4 have the right people.

5 DR. APOSTOLAKIS: Well, it raises other
6 issues as well. I mean why are we looking at these
7 sites just because they happen to be sites that
8 somebody decided, you know, to ask an early site
9 permit for, and using those new methods and finding
10 that we have more stringent criteria? How about the
11 sites that are not -- that are not being used for an
12 early site permit? I mean it is a generic issue
13 there, I think.

14 MR. SCOTT: I think that's what they are
15 looking at. That's what he's saying they are looking
16 at.

17 DR. APOSTOLAKIS: And we will have a
18 presentation on this at some point?

19 MR. SCOTT: That will be down the road,
20 but that's --

21 DR. APOSTOLAKIS: Down the road?

22 MR. SCOTT: Down the road.

23 DR. APOSTOLAKIS: Okay. Very good.

24 DR. POWERS: Okay. Please continue.

25 MR. SCOTT: Okay. Slide 43. This is just

1 a wrap-up.

2 Again, we expect most open item responses
3 in very shortly. We are working through some issues,
4 looking forward to seeing the interim ACRS letter, and
5 to coming back this summer to brief you again. And
6 come back tomorrow and brief you again.

7 And as noted on the bottom bullet here,
8 the staff is identifying lessons learned from this
9 process of which there have been many. While we
10 appreciate the praise for the review standard, we are
11 going to be incorporating --

12 DR. POWERS: I'm fairly complimentary of
13 your SER as well. I mean I think you spend too much
14 time quoting the application, but you know, it's not
15 badly written. I mean it was readable.

16 DR. APOSTOLAKIS: The citation of figures
17 and tables, though, that are in the applicant's --

18 DR. POWERS: Yeah, I agree with you, you
19 really ought to be put -- if it's a pertinent table,
20 you ought to put it in.

21 DR. APOSTOLAKIS: And those terms, we said
22 earlier, in geology -- my goodness.

23 DR. POWERS: That is another one. I did
24 take the trouble of checking how many of the
25 geological terms you used, and I had to look up four

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1 that actually were in one of those large dictionaries.
2 It's not 100 percent.

3 MR. SCOTT: Yeah, okay. So what I think
4 you're telling us, we had sort of a glossary for the
5 hydrologic terms.

6 DR. POWERS: Right.

7 MR. SCOTT: But not for the seismological
8 terms. We need to add that.

9 DR. POWERS: You might want to just be
10 fair with your public and not kill them.

11 MR. SCOTT: Especially that subject matter
12 is particularly arcane, so --

13 DR. POWERS: Well, you know, my criterion
14 is if it's in a decent-sized dictionary, great. If
15 it's not in a decent-sized dictionary, then I say,
16 well, maybe it deserves a little --

17 MR. SCOTT: Well, it fools Bill Gate every
18 time.

19 DR. APOSTOLAKIS: Well, most of these are
20 of Greek origin --

21 DR. POWERS: That is not a criterion for
22 fooling Bill Gates. It does, however, because it
23 fools one of the word processors that sometimes lead
24 to misspellings.

25 MR. SCOTT: Did you find one in there?

1 DR. POWERS: Several times, I saw words of
2 a technical nature that had just been misspelled
3 probably because the word processor -- somebody said,
4 oh, yeah, fix that, and didn't mean to.

5 MR. SCOTT: Okay.

6 DR. POWERS: Those will be impossible to
7 find unless I circle them.

8 MR. SCOTT: Well, if you happen to, and --
9 we'll get the new project manager on that right away.

10 (Laughter.)

11 MR. SCOTT: The rest of these slides are
12 the back-ups that contain the items that you all
13 elected not to discuss.

14 I would like to follow up on a couple of
15 things.

16 First of all, we owed you a copy of
17 supplement 2, the emergency planning document, and
18 Bruce Musico, as usual, is right on it and here are
19 about 10 copies which we will hand off to you.

20 We also need to provide you the reference
21 to a copy of the PAVAN data that supports -- what was
22 it, Chi over Q? Chi over Q. So we'll get to that.

23 Bruce and I failed to open on one of the
24 three points regarding use of existing information,
25 but Bruce handed me the copy of the review standard

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1 here. The three items that are needed -- and this was
2 provided interview standard -- were an existing
3 emergency plan is -- you need -- the applicant needs
4 to show that it's applicable to the proposed site.
5 That's in most cases for an adjacent site, it's not
6 going to be too tough. There might be some
7 considerations in there, but anyhow, they need to do
8 that. Show it's up to date, and reflects the use of
9 the proposed site for possible construction for a new
10 reactor or reactors.

11 If you are going to build a new reactor
12 and it removes a possible evacuation route from use,
13 then clearly you would need to address that. So it's
14 that kind of thing that needs to be addressed. So I
15 wanted to follow that up.

16 DR. POWERS: And those sound eminently
17 reasonable, going in, plunging into details on
18 hospital staffing on things like that sounds like an
19 exercise.

20 MR. SCOTT: That point has been raised.

21 That concludes our prepared remarks. We
22 greatly appreciate your time, and look forward to --

23 DR. POWERS: Now you have asked for what
24 you have gently called an interim letter.

25 MR. SCOTT: Yes.

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1 DR. POWERS: What do you want us to say?

2 MR. SCOTT: Say again.

3 DR. POWERS: What do you want us to say?

4 You're on the right track, keep going, good job?

5 MR. SCOTT: I would be -- if you felt
6 moved to say that, we'd be happy to have you say that.

7 DR. POWERS: I'm just trying to --

8 DR. SIEBER: How about one that's highly
9 critical?

10 (Laughter.)

11 DR. APOSTOLAKIS: The staff is asking the
12 licensee whether they want to do a backfit. Now the
13 chairman is asking you what you want in a letter?

14 (Laughter.)

15 DR. POWERS: I'm just trying to understand
16 what is meant by the word "interim." I didn't say
17 that's what they were going to get.

18 MR. SCOTT: If there are points that we
19 need to address based on your review, then we would
20 much rather hear them now than four or five months
21 from now when you give the final letter. So we
22 appreciate the fact it's clear that you all have taken
23 a good look at it, and if you have some
24 recommendations, we need to --

25 DR. POWERS: Yeah, that's one comment I'm

1 going to make to you, when you appear -- you're on the
2 agenda for tomorrow?

3 MR. SCOTT: Yes.

4 DR. POWERS: Let me assure you that most
5 of the other committee members who are not here
6 probably have not looked at this and a simple editing
7 of these slides probably is not going to be adequate
8 for them.

9 MR. SCOTT: Okay.

10 DR. POWERS: You or the applicant is going
11 to have to tell them what this site is, what's there,
12 and give them some background.

13 MR. SCOTT: You didn't find the discussion
14 of that in here?

15 DR. POWERS: No. I mean give them a
16 picture, tell them where it is.

17 MR. SCOTT: Slide 7.

18 DR. POWERS: That may have been when I was
19 out doing my thing, but my looking through it --

20 MR. SCOTT: Seven, 8, 9, 10.

21 DR. POWERS: Give them a picture and some
22 of your maps out of your document.

23 MR. SCOTT: Okay.

24 DR. SHACK: Show them the one where the
25 nearest big town is Mineral.

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1 DR. POWERS: Yeah. Yeah. That's a good
2 one.

3 DR. SIEBER: And show them the one with
4 the faults traced on it. Show them all three streets
5 and the post office.

6 MR. SCOTT: Okay. So what you are asking
7 for is some drawings to --

8 DR. POWERS: Something to give us some
9 background.

10 MR. SCOTT: Okay.

11 DR. POWERS: How long do they have? Hour
12 and a half?

13 MR. SCOTT: That's an hour and a half for
14 ourselves and Dominion; right? Hour and a half total.

15 DR. POWERS: And so you're -- I mean
16 effectively I would count on maybe 30 minutes total of
17 talking for you.

18 MR. SCOTT: Sure.

19 DR. POWERS: Okay. So you're going to
20 have to get to your points right away and some of
21 these on this -- you know, first-of-a-kind, things
22 like that, and probably the chapter headings is about
23 all you're going to get through there.

24 MR. SCOTT: And I had, of course, drafted
25 the presentation for tomorrow, and I hear you giving

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1 me some feedback on that.

2 What I had thought to do was to move all
3 of the detailed, you know, future item discussions to
4 the back-ups, and any that you all want to talk about,
5 we can talk about, which would largely leave us with
6 the overall "here's where we've been, here's where
7 we're going, here's what we're trying to do," you
8 know. I anticipated that would run the designated
9 time. You never know, but that was the thought.

10 DR. POWERS: Yes. Well, what I want to do
11 now is to discuss with the -- have each one of the
12 members give you some feedback, both on the -- on what
13 they have read and seen, what they think will be
14 helpful to the full committee tomorrow.

15 I see no reason not to start with Jack.

16 DR. SIEBER: Okay. I guess my overall
17 impression of the application and the SER as it stands
18 now is good. I'm familiar with the site. I was on
19 their safety review committee for a while. I'm
20 particularly interested in issues involving emergency
21 planning and that's pretty established for that site,
22 you know. They already have an emergency plan, they
23 have a notification system. They have exercised that
24 plan, and the state of Virginia and Louisa County have
25 been through this process. So I don't see that as

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1 anything particularly challenging with regard to the
2 site.

3 There was a question asked earlier why do
4 people pick sites where there's already existing
5 plants, and that's probably one of the reasons, is the
6 infrastructure is already there, a talented workforce
7 is already there, and a lot of the staff review has
8 already been done for the construction permit stage.

9 Overall, I don't see any impediments now
10 except for the open items to completing the staff's
11 review and issuing an early site permit.

12 Of course, a lot can happen in five or six
13 months.

14 With regard to tomorrow afternoon's
15 presentation, I would suggest perhaps a little bit
16 more general approach. Those of us who have read
17 partially the documents -- by the way, there is a
18 tremendous number of pages, and I could not testify
19 that I read every page.

20 On the other hand, I think a general
21 review of the process and how the North Anna site fits
22 into that process and complies is a good approach for
23 a presentation to the full committee.

24 DR. POWERS: I'm stunned, Jack, that you
25 haven't read every page. How about the references?

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1 Did you have a chance to go through those?

2 DR. SIEBER: I got all those.

3 DR. POWERS: Okay. Good. I couldn't find
4 49 at all.

5 Go ahead.

6 MR. SCOTT: Since this one didn't
7 challenge you enough, the next one we'll try to bring
8 in some more references.

9 DR. SIEBER: Is that a Midwest site?

10 MR. SCOTT: Clinton, yes.

11 DR. SIEBER: That will do it. Okay.
12 That's it, Mr. Chairman, for me.

13 DR. POWERS: Bill?

14 DR. SHACK: I don't think I have anything
15 to add to what Jack said.

16 DR. POWERS: Mario?

17 DR. BONACA: No, the same. I think that
18 actually the development of parameter envelope and the
19 concept they were proposing -- I think the SER is
20 pretty clear. I think that -- I just was wondering
21 about the issue of population density because that
22 would have been a good exercise to understand how
23 different it would have been, but for this site, where
24 there isn't a concern with the person density, it
25 seems to be --

1 MR. SCOTT: We have no open items in that
2 area.

3 DR. SIEBER: On the other hand, the
4 population has changed a fair amount in the last 20
5 years. You know, they are selling homes all around
6 the lake, and on the other hand, it is a dense pack.

7 MR. SCOTT: What you have --

8 DR. POWERS: Once, Jack, you drive all the
9 Hollywood stars out of Montana, might they not descend
10 upon this?

11 MR. SCOTT: What you have at Lake Anna is
12 a large number of -- a significant number of lake
13 houses, but once you get back from the lake, the
14 population --

15 DR. POWERS: I was surprised, the
16 transient population, temporary occupants, they are
17 almost equal to the total population.

18 DR. BONACA: If I remember,
19 Charlottesville is 30 miles?

20 MR. SCOTT: Is that, Dominion, 30
21 something miles to Charlottesville?

22 MR. GRECHECK: It's either 35 or 37.

23 DR. SHACK: But I would think that
24 Charlottesville is growing at a fairly rapid clip, but
25 37 miles is 37 miles.

1 MR. SCOTT: There's at least 20,000
2 students there.

3 DR. SIEBER: The prevailing wind is the
4 other way toward Richmond, and Richmond --

5 DR. SHACK: Richmond is what, 50 miles
6 away?

7 MR. SCOTT: Richmond is a similar distance
8 away from Charlottesville, 42, 40 miles, something in
9 there.

10 DR. BONACA: And you have also some urban
11 area in the northeast portion, right? About -- what
12 is it --

13 MR. SCOTT: That's about 70 or 80 miles
14 away.

15 DR. BONACA: That's what, Petersburg?

16 MR. SCOTT: Oh, you're thinking of
17 Washington. I'm sorry.

18 DR. BONACA: No, that's all right.

19 MR. SCOTT: You're thinking of
20 Fredericksburg.

21 DR. BONACA: Fredericksburg.

22 MR. SCOTT: Which is not a huge town,
23 although it has seen a lot of growth.

24 DR. POWERS: Dr. Kress, I have admired
25 your restraint in not bringing up LERF criteria here.

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1 I wish you would comment on that.

2 DR. KRESS: I think LERF is the wrong
3 criteria to use. That's why I haven't brought it up.
4 And I don't see it showing up anywhere, anyway.

5 My interest is in --

6 DR. POWERS: I'm surprised that you think
7 it's not the criterion, because --

8 DR. KRESS: It's the wrong --

9 DR. POWERS: -- if I add a third reactor
10 on a site that just barely meets the LERF criteria,
11 then I push it over. Unless it's a perfectly safe --

12 DR. KRESS: That was one of the
13 motivations for my question of adding a plant just
14 like they already have there. But they're going to
15 add one of these new plants where the LERF is so low,
16 you won't even see it.

17 But my interest is in this population
18 around the plant, and not just -- I would like to see
19 more of the population that would be affected by
20 latent effects. We don't see those in these criteria
21 anywhere. I would like to know what the -- more about
22 distant populations like Richmond, Charlottesville,
23 and why they don't become part of the considerations
24 for these early site permits.

25 So I would like to at least see what's

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1 around this plant at distances where you would expect
2 latent fatalities, if you had an accident. That would
3 be my -- what I would like to see more of.

4 I don't see it in the criteria anywhere on
5 how you do it, so, you know, I don't know what I'm
6 going to do with it, but it seemed to me like it ought
7 to be a consideration.

8 DR. POWERS: Professor Apostolakis.

9 DR. APOSTOLAKIS: Well, I was overwhelmed
10 by the amount of material that was supplied to us, but
11 I must say I was also impressed by the quality of the
12 staff's review, and I agree with the previous speakers
13 who praised the draft SER.

14 So my overall impression is very
15 favorable. That's it.

16 DR. SHACK: I would say I appreciated what
17 to me was a very clarifying discussion on the seismic
18 activity, and I thought that was helpful.

19 DR. POWERS: I'm sure there will be lot of
20 questions.

21 MR. SCOTT: All these individuals who
22 supported us today are coming back for a return
23 engagement tomorrow, and --

24 DR. APOSTOLAKIS: So the return period is
25 one day?

1 (Laughter.)

2 MR. SCOTT: That's right. And we don't
3 think that's going to increase between now and
4 tomorrow.

5 DR. POWERS: Certainly not by a factor of
6 10.

7 DR. APOSTOLAKIS: I think this was
8 amazing. It used to be several thousand years and now
9 it's 500. I couldn't believe it.

10 DR. SIEBER: That's one second in universe
11 time.

12 DR. APOSTOLAKIS: I'm glad you said that.

13 DR. POWERS: What I am struggling with is
14 what to write on this, is whether we should speak to
15 issues that may fall in your committee of lessons
16 learned, or wait until you have had a chance to think
17 about lessons learned and maybe we could come back and
18 get together, and kind of have a reasoned discussion
19 of lessons learned together. I guess it's not you
20 that's coming back, but --

21 MR. SCOTT: I'll write that down.

22 DR. POWERS: Somebody is going to come
23 back and discuss -- will be in a position to come back
24 and discuss the lessons learned, and maybe lessons
25 learned should be something that we should wait until

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1 then to do. Is that -- and just deal with the facts
2 here?

3 MR. SCOTT: If it's items, for example,
4 regarding the regulatory framework, then we have the
5 framework that we have.

6 DR. POWERS: Yeah, I understand. I
7 understand.

8 MR. SCOTT: Those kinds of issues would be
9 better solved in another venue.

10 DR. POWERS: It is to -- I mean the useful
11 discussion of lessons learned are in fact those that
12 discuss the regulatory framework.

13 MR. SCOTT: Right. Well, that's one
14 subset. There are a lot of -- we have learned a lot
15 from these applications. It's not just in the
16 regulatory framework.

17 MS. DUDES: Well, and let me just add --
18 this is Laura Dudes again. I mean I don't want to
19 lose something that's in your head that's a lesson
20 learned, and I'm not sure I want to take -- as I said,
21 when I opened up and I said okay, well, we're
22 staggered by two months and we're going to be here
23 before you know it with the Clinton DSER and right
24 after that we're going to be here with the Grand Gulf
25 DSER, and then we're going to have another short,

1 brief period of time and we're going to be going final
2 on this.

3 So I don't want to lose the lessons
4 learned. I know that we are collecting them now, and
5 I hope it's something -- I know that the industry is
6 collecting them now, too, as these are the first
7 initial -- the first-of-a-kind ESPs.

8 So I think it is really important that we
9 address that. I don't know how to say it, so I'll say
10 it plain: I don't want to respond to the lessons
11 learned in the middle of this unless it's a safety
12 issue that we need to correct. But if it's an
13 efficiency or an effectiveness or something like that,
14 I would like to follow our process, and I know we plan
15 to do lessons learned and update our review standard,
16 listen to what the industry has to say, and also take
17 into account what you think.

18 So in terms of including items in the
19 letter, I think it's great to not lose a lesson
20 learned or a thought; it's how we respond to it and
21 how we all understand what's coming up, and maybe
22 we'll do lessons learned after we do all three DSER
23 meetings.

24 DR. POWERS: I understand your point.

25 The other thing that I'm struggling with

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1 is unevenness. Both the application and the SER,
2 where in technical depth we have a modest textbook on
3 seismology, in the source term, we say, well, here's
4 a measure.

5 That is a distressing feature.

6 MR. SCOTT: Perhaps a helpful way of
7 dealing with that, you have given us an example and we
8 owe you some additional information on that. If there
9 are other examples that are troubling you, if we can
10 discuss those in specifics, then we can take
11 appropriate corrective actions if that's what is
12 indicated.

13 You are certainly correct, if you take the
14 total, you know, page count of the application, there
15 is a lot more seismic than any one other subject area,
16 and for reasons that were stated. But if we have not
17 adequately documented our basis on specific items,
18 then we need to fix that, clearly.

19 DR. POWERS: And I guess it's transparent
20 that I struggle with nonprognostication.

21 MR. SCOTT: With what?

22 DR. POWERS: Nonprognostication.

23 MR. SCOTT: Oh, yes.

24 DR. POWERS: And there, I think, you are
25 in the business of prognosticating, and if it were a

1 situation where people -- I could say, okay, here's
2 one group of people that say that things are going to
3 get worse. Here's another group of people that say
4 things are going to get better, I'd say fair enough.
5 But I think I can find situations where everybody
6 agrees where the trend is. They may disagree over the
7 reasons, but the trend they got down, and the
8 consequences of those trends they disagree about, and
9 to be silent on that, I think is not a good strategy.

10 MR. SCOTT: I guess I would respectfully
11 say that what I have read in the press is that it's
12 not quite settled that 100 percent of everyone is on
13 one side of the global warming issue, for example.

14 I am not sure that there is uniformity in
15 the conclusions that you are referring to. I could be
16 wrong, but I believe there is still a lot of ongoing
17 discussion about that. But as we said before, you are
18 correct, it is not in the process to try to predict
19 that for this type of activity.

20 DR. KRESS: And one other question. The
21 prognosticating of say population changes, do you do
22 it for the 20 years of the permit, or do you do it for
23 the 80 years of the permit plus the lifetime of the
24 reactor plant once it gets built?

25 MR. SCOTT: As Jay Lee said earlier, we --

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1 the applicant provided a population projection for the
2 20-year assumed period of the essentially, plus a 40-
3 year assumed plant lifetime, which took them out to
4 2065.

5 DR. KRESS: Okay. Well, they did add the
6 two in, then. But it's 40 years instead of 60?

7 MR. SCOTT: Well, no, the total was 60; 20
8 for the ESP --

9 DR. KRESS: I would use 80 because of the
10 life extensions and most of the new plants are coming
11 in for 60 years, anyway.

12 DR. POWERS: And I bet you your last 20
13 years would be exceptionally reliable.

14 DR. KRESS: Yeah.

15 MR. SCOTT: You're out there.

16 DR. POWERS: Dominion is speaking as well
17 at the meeting. And we have given you not a whit of
18 help, have we?

19 MR. GRECHECK: Well, I was going to talk
20 to Mike afterwards and see how --

21 DR. POWERS: Maybe you can get together
22 and have some --

23 MR. SCOTT: Gene, you need to step up to
24 the microphone, please.

25 DR. POWERS: You see what my problem is

1 for the full committee is I'm not sure that they will
2 have enough background to know what you're talking
3 about.

4 MR. SCOTT: Which what?

5 DR. POWERS: The rest of the committee,
6 those not in attendance.

7 MR. SCOTT: Right.

8 DR. POWERS: I'm not sure they'll -- if I
9 just take these presentations and throw away every
10 other slide, I'm not sure they will have enough
11 background to understand what you're talking about.
12 And so I'm just asking for a little more context and
13 perspective here.

14 MR. GRECHECK: I understand that point,
15 and one of the things I was talking to my staff back
16 here about is that we certainly need to be prepared to
17 address that. But, on the other hand, I have not
18 prior to this discussion, I had not anticipated making
19 a lengthy presentation tomorrow, thinking that the
20 committee would want to spend most of the time talking
21 to the staff about the work that they had done.

22 DR. POWERS: I think that is a fair
23 assumption.

24 MR. GRECHECK: Right. But we will try to
25 put together something that meets your requirement.

1 DR. SIEBER: I think it would be
2 worthwhile, by the way, if there was one slide at the
3 beginning of somebody's presentation that says these
4 are the objectives we are trying to accomplish when
5 the commission issues an early site permit. Sort of
6 a scoping kind of thing.

7 DR. POWERS: And if you just take your
8 table out of -- if you follow that with your table out
9 of RS-002, which says, okay, here are the areas of
10 review --

11 MR. GRECHECK: Right.

12 DR. POWERS: -- that list -- that's an
13 excellent list, and that's what you followed, but it
14 provides -- reading that provides all the context I
15 think anybody needs to have in going into the
16 subsequent discussion.

17 DR. BONACA: I was just curious about one
18 thing. They had a permit to construct four units on
19 that site.

20 MR. SCOTT: At one time they had
21 construction permits for Units 3 and 4, yes.

22 DR. BONACA: And two of them were
23 partially constructed?

24 MR. SCOTT: Yes.

25 DR. BONACA: How does the permit expire?

1 I mean is there a time limit to it?

2 MR. SCOTT: The regulations allow for a
3 term of up to 20 years, which can be renewed with a
4 timely application. This applicant and, in fact, all
5 three applicants have asked for a 20-year term.

6 DR. SIEBER: For the old unit. The old --

7 MR. SCOTT: Oh, old units.

8 DR. SIEBER: The old designs they didn't
9 finish.

10 MR. SCOTT: Right. Gene, correct me if
11 I'm wrong here, you all -- they are cancelled and
12 there is no active construction permit for those
13 units?

14 MR. GRECHECK: That's correct. The two
15 units, Units 3 and 4, were cancelled separately. Unit
16 4 was cancelled first, and then Unit 3, but that
17 construction permit expired, and we made no attempt to
18 renew it.

19 DR. POWERS: We have received no request
20 from the public to make comments, but I will ask,
21 having heard all of this, if there are any comments
22 from anyone else in the audience or the public?

23 (No response.)

24 DR. POWERS: Seeing none, I will ask the
25 members if they have any closing comments?

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1 (No response.)

2 DR. POWERS: Seeing none, I will adjourn
3 this subcommittee meeting, with my thanks for the
4 presenters, those running the slides and about to take
5 on the heavy lifting, even though she drove ACR-700
6 away. I will thank Dominion for coming up and
7 apologize for sandbagging them with what they thought
8 was a brief presentation. And I will thank K.C. for
9 her admirable assistance.

10 And with that, I will adjourn.

11 (Whereupon, at 5 p.m., the subcommittee
12 meeting was adjourned.)

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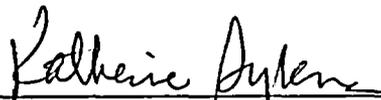
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CERTIFICATE

This is to certify that the attached proceedings
before the United States Nuclear Regulatory Commission
in the matter of:

Name of Proceeding: Advisory Committee on
Reactor Safeguards
ESP Ad Hoc Subcommittee
Meeting
Docket Number: n/a
Location: Rockville, MD

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Presentation to the Early Site Permit Subcommittee
of the Advisory Committee
on Reactor Safeguards

Safety Review of the
North Anna Early Site Permit Application

Presented by
Michael Scott
Senior Project Manager
New, Research and Test Reactors Program
March 2, 2005



Purpose

- Brief the Subcommittee on the North Anna early site permit (ESP) application and the status of the NRC staff's safety review of that application
- Support the Subcommittee's review of the application and subsequent interim Committee letter to the Commission
- Answer the Subcommittee's questions



Agenda

- Background 5 min
- Milestones 5 min
- North Anna ESP Application 10 min
- Plant Parameter Envelope Concept 10 min
- Draft Safety Evaluation Report (DSER) 10 min
- DSER Issues 10 min
- Future-Oriented Items 40 min
- DSER Conclusions 5 min
- Presentation Conclusions 5 min
- Discussion / Subcommittee questions



Background and Regulatory Framework

- Subpart A to 10 CFR Part 52 governs ESPs
- Subpart B to 10 CFR Part 100 contains applicable siting evaluation factors
- 10 CFR 52.23 requires ACRS to report to Commission on portions of application that pertain to safety (i.e., Site Safety Analysis Report)
- Purpose of ESP process is to resolve issues related to siting at early stage
- North Anna is first of three ESP applications the NRC staff is currently reviewing - others follow at two-month intervals



Completed Milestones

- Dominion Nuclear North Anna, LLC (hereafter Dominion) submitted ESP application 9/25/03
- Staff docketed application 10/23/03
- Staff issued draft environmental impact statement 12/10/04
- Staff issued draft safety evaluation report (DSER) 12/20/04



Future Milestones

- ACRS interim letter to the Commission assumed 03/18/05
- Staff provides final SER (FSER) to ACRS late May 2005 (prior to final division director and Office of the General Counsel concurrence)
- Staff issues FSER 06/16/05
- ACRS letter to the Commission assumed 07/25/05
- Staff incorporates ACRS letter and issues FSER as NUREG 08/29/05
- Mandatory hearings begin fall 2005
- Commission decision assumed mid 2006



North Anna ESP Application

- Submitted for a site wholly within the existing North Anna Power Station (NAPS) site, adjacent to existing North Anna units 1 and 2 and partially overlaying site of canceled units 3 and 4 (partially constructed in early 1980s; most structures subsequently removed)
- NAPS is owned by Virginia Power and Old Dominion Electric Cooperative and controlled by Virginia Power
- ESP applicant, Dominion, is a wholly-owned subsidiary of Dominion Resources, Inc. (as is Virginia Power)
- Dominion seeks authorization for limited work in accordance with 10 CFR 52.17(c) and 10 CFR 50.10(e)(1)



North Anna ESP Application

- Dominion requests site be approved for location of two “units” of up to 4300 MWt
- Each unit may be one large reactor or multiple smaller reactors
- Dominion has chosen not to submit a specific design but instead has submitted a plant parameter envelope (PPE) based on a number of current and future reactor designs

ACR700

ESBWR

AP1000

ABWR

GT-MHR

IRIS

PBMR



PPE CONCEPT

- Staff's review of PPE values in ESP applications limited to whether they are reasonable
- Applicant retains flexibility to choose a design at combined license (COL) or construction permit stage rather than at ESP
- ESP would not approve siting of any particular design
- Staff plans to include, in any ESP that might be issued for the site, PPE values used in ESP compliance demonstrations [e.g., source term, atmospheric dispersion factors (X/Q)]
- COL applicant will need to show that design falls within the PPE values specified in the permit or will need to show regulations have been met



North Anna ESP Application

- Unit 3 to use once-through cooling
- Unit 4 to use “dry” closed-loop (radiative) cooling to atmosphere to eliminate/minimize lake temperature increase and water demand on lake
- Underground ultimate heat sink (UHS) if design selected requires a UHS
- Dominion considering use of intake and discharge structure of canceled units 3 and 4
- Dominion seeks 20-year ESP term



DSER

- First ESP DSER
- Benefited from resolution of a number of generic issues prior to application submittal
- Review guidance is RS-002, “Processing Applications for Early Site Permits,” which updates the site-related sections of NUREG-0800 and addresses ESPs
- Despite “up front” issue resolution reflected in guidance, some additional “generic” issues arose during application review and needed to be resolved during DSER development



Safety Review Areas and Lead Staff Reviewers

- Meteorology: Brad Harvey
- Hydrology: Goutam Bagchi (contract support from Pacific Northwest Laboratory) (PNL)
- Site Hazards: Kaz Campe (contract support from PNL)
- Geology/seismology: Cliff Munson (support from U.S. Geologic Survey)
- Demography/Geography: Jay Lee
- Emergency Planning: Bruce Musico (consultation with Federal Emergency Management Agency)
- Quality Assurance: Paul Prescott
- Physical Security: Al Tardiff
- Radiological Consequence Analysis: Jay Lee



Issues - Emergency Planning

- Dominion has elected to seek acceptance of “major features” of emergency plans as provided in 10 CFR 52.17(c)(ii)
- Concept is not defined in detail in regulations
- NRC/FEMA have issued draft guidance document, Supplement 2 to NUREG-0654
- Generic industry concern with degree of finality associated with major features
- Staff can grant finality as to the overall description but will need to address implementation details at COL



Issues - Seismic

- Dominion proposed new “performance-based” approach for determining safe shutdown earthquake (SSE)
 - Not entirely consistent with NRC-approved method in RG 1.165
 - ASCE Standard 43-05 describes this approach
 - Risk-based approach that targets performance goal
 - 1×10^{-5} annual probability of unacceptable performance of Category 1 systems, structures, and components
 - Target seismic risk based on core damage frequencies for existing nuclear power plants



Issues - Seismic

- Because staff had not reviewed or approved the performance-based approach, staff advised Dominion that time required for review of this method would likely result in delay in issuance of staff's review products for the ESP application
- Applicant ultimately elected to use RG 1.165 method with justification for use of reference probability 5×10^{-5} per year

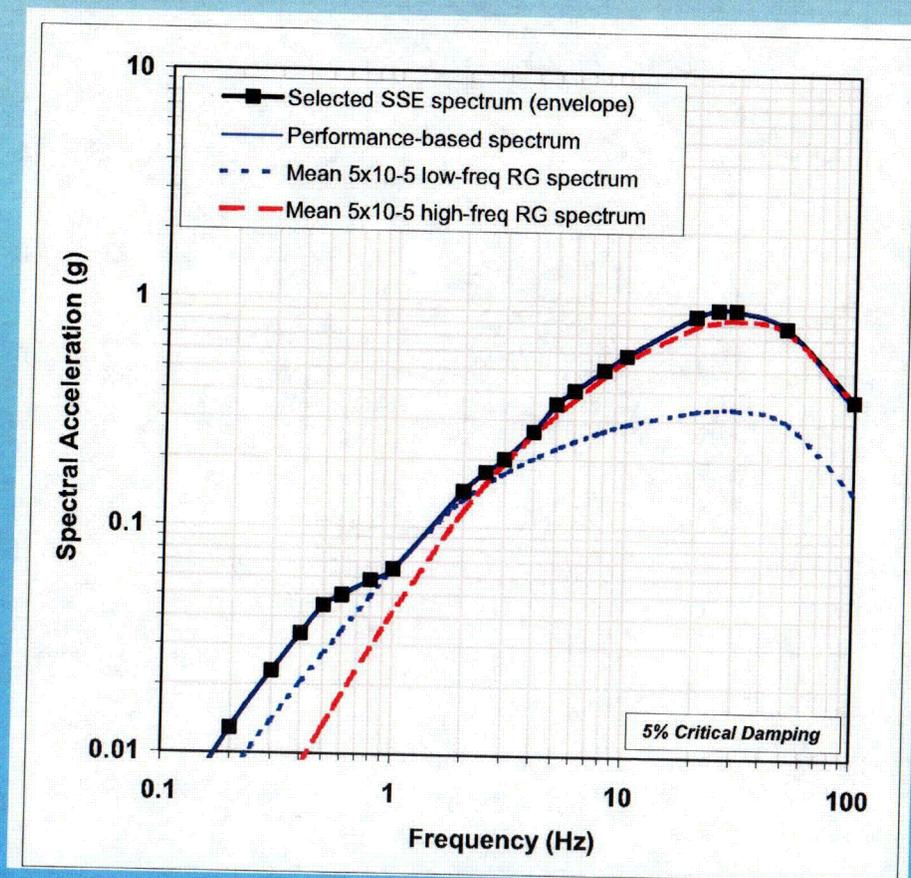


Issues - Seismic

- Because North Anna is a rock site, site SSE exceeds design SSE at high frequencies for designs certified to date
- COL applicant would need to resolve disparity if one exists (dependent on design selected)
- See SSE vs. RG 1.60 diagram

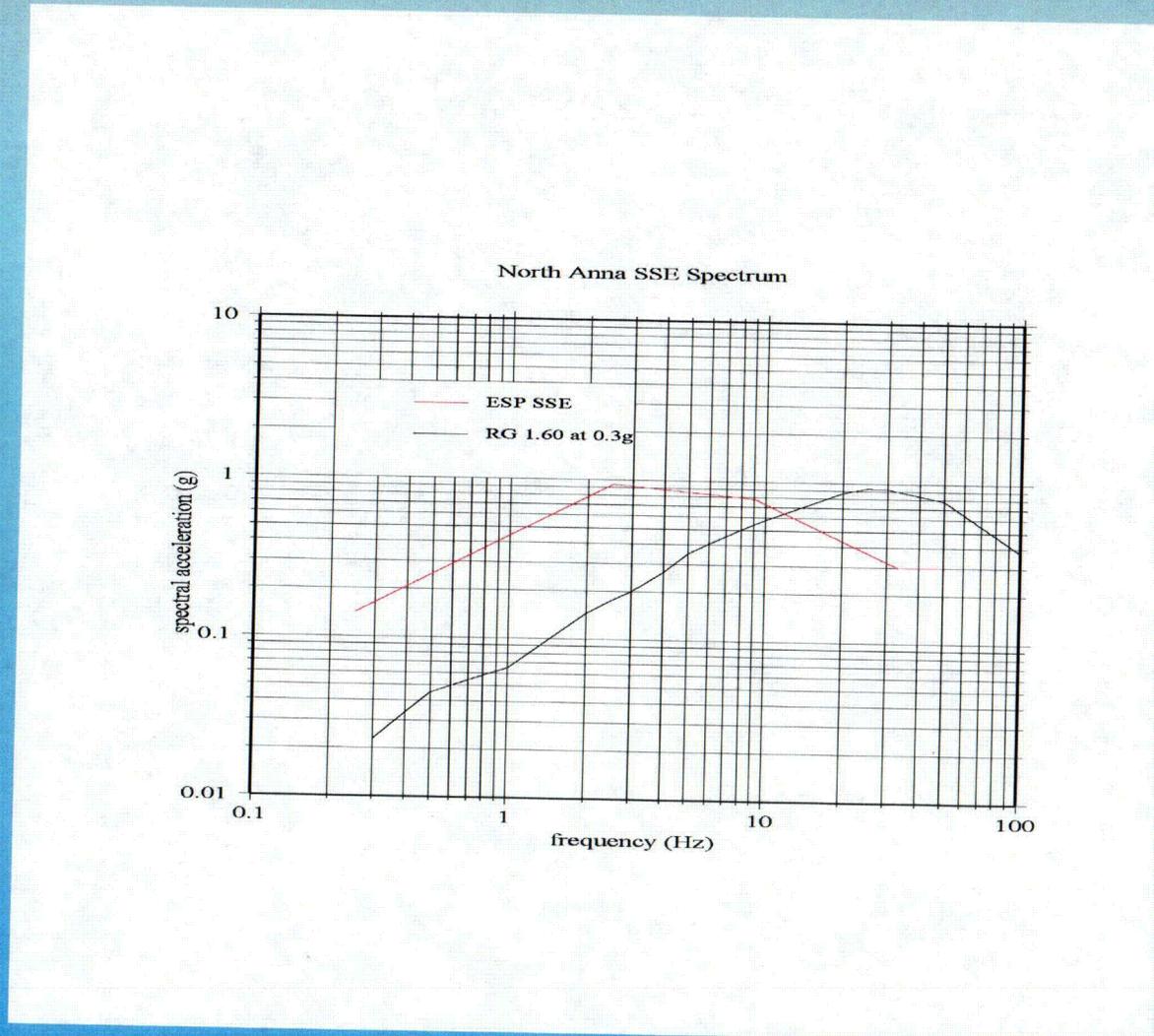


North Anna SSE





SSE vs RG 1.60





Issues - Site Characteristics vs Design Inputs

- 10 CFR 100.21(d) states:
 - The physical characteristics of the site, including meteorology, geology, seismology, and hydrology must be evaluated and site parameters established.
- General Design Criterion 2, while largely not required at ESP, states:
 - The design bases for these structures, systems, and components shall reflect: (1) Appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated...



Issues - Site Characteristics vs Design Inputs

- Issue is what is needed and/or appropriate at ESP
 - Staff has given Dominion credit for appropriate consideration of most severe natural phenomena including margin
 - Dominion concerned that ESP should not specify design bases, but rather may specify site characteristics that would serve as minimum site-related design inputs at COL



Issues - Design/Site Interface

- Several examples involving interface between site (intended to be subject of ESP) and design (intended to be subject of design certification and/or COL)
 - Potential interferences between new and existing plants
 - Potential underground UHS in presence of water table near surface
 - Potential for frazil and anchor ice
- These individual items will be discussed in later slides



Future-Oriented Items in DSER

- Open items – Staff needs additional information prior to developing FSER
- Confirmatory item – Staff needs to verify applicant's planned actions as stated in its responses to requests for additional information
- COL action items – Site-related items that are more appropriately addressed at COL stage
- Permit conditions – Conditions the staff proposes be imposed on holder of the ESP should one be issued



Open Items

- 2.1-1, Control of exclusion area
 - Applicant must have control over exclusion area or irrevocable right to obtain control
 - Legal issue being addressed in Office of General Counsel
- 2.3-1, Basic wind speed (fastest mile)
 - Dominion used 100-year return fastest mile value from industry standard
 - Observed data point exceeds 100-year return from standard
 - Dominion has chosen to provide 100-year return 3-second gust in lieu of fastest mile



Open Items

- 2.3-2, Snowpack weight vs snow load
 - Regulatory Guide 1.70 states weight of 100-year snowpack and 48-hour probable max winter precipitation (PMWP) should be used to provide weight of snow and ice on safety-related structures
 - Staff branch technical position provides clarification:
 - Normal winter precipitation load should be weight of 100-year snowpack
 - Extreme winter precipitation load should be weight of 100-year snowpack plus 48-hour PMWP
 - Dominion plans to provide 100-year snowpack, 48-hour maximum snowfall, and 48-hour winter PMP
 - COL applicant will determine how to combine these characteristics for comparison with design for extreme environmental load category unless otherwise justified



Open Items

- 2.3-3, Site characteristic to assess potential for freezing in UHS
 - Dominion plans to submit accumulated degree-days below freezing
 - Issues remain regarding choice of weather station and methodology for calculating
- 2.3-4, Impact of dry cooling on atmospheric temperature
 - Dominion plans to provide qualitative or semi-quantitative assessment
 - Approach recognizes system not designed
- 2.4-1, Coordinate reference system
 - Dominion plans to submit reference system and units of measure



Open Items

- 2.4-2, Minimize distance to existing systems, structures, and components (SSCs)
 - Existing NAPS Units 3 and 4 discharge tunnel likely within 1 foot of Units 1 and 2 service water piping
 - What will happen if COL applicant finds it cannot use existing structure?
 - Dominion states:
 - Not feasible or necessary to specify vertical separation distance
 - Only one of many examples of possible interferences that can and will be addressed at construction stage
 - 10 CFR 50.59 review of changes provides protection for operating plant



Open Items

- 2.4-3, Impacts of low-flow conditions
 - Dominion plans to propose minimum lake level same as for NAPS units
- 2.4-4, Ice jam formation and breakup
 - Dominion plans to show impact bounded by already-analyzed impact of breach of upstream dams
- 2.4-5, Minimum intake water temperature
 - No clear quantitative site characteristic regarding frazil ice
 - Dominion plans to note in application that frazil ice conditions could occur at the site
 - COL applicant would need to describe engineered measures to handle frazil ice



Open Items

- 2.4-6, Stability of underground UHS against ground water pressure head
 - Water table near surface, could lift empty or partially full UHS
 - Absent construction details, would have site characteristic for groundwater elevation
- 2.4-7, Correlate ground water level measurements taken in support of the ESP application with data from long-term piezometers
 - Dominion states they do not correlate well (different purposes and locations)
 - Need to show post-drought data not anomalous
 - Dominion plans to take additional data
 - Dominion will need to assess impact of lack of correlation



Open Items

- 2.4-8, Conservative hydraulic conductivity
 - Dominion plans to provide more conservative method
- 2.4-9, Upward hydraulic gradients
 - Dominion plans to show such gradient is small fraction of horizontal flow and bound its impact
- 2.4-10, Variation in hydraulic gradient
 - Dominion plans to provide additional seasonal data
- 2.4-11, Onsite measurement of adsorption and retention coefficients
 - Dominion plans to use onsite measurements of soil conditions and a lookup table from the Environmental Protection Agency to determine coefficients



Open Items

- 2.5-1, Criteria for ground motion model weighting in the model clusters for the EPRI 2003 ground motion evaluation
 - Dominion has responded to this item
 - Staff has questions regarding evaluation
 - Heavy weighting in one cluster for three ground motion models
 - Seismic attenuation parameter for three models in one cluster
 - Criteria for overall weighting for clusters not clearly explained



Open Items

- 2.5-2, Incorporate site-specific geologic properties and their uncertainties into the determination of safe-shutdown earthquake (SSE)
 - Dominion plans to determine SSE at hypothetical rock outcrop consistent with NRC guidance and determine transfer function
 - Dominion has provided method to staff, and staff has no questions on it



Open Items

- 13.3-1, Offsite laboratories
- 13.3-2, Orange County emergency notification program
- 13.3-4, Reliance on DOE for plume tracking
- 13.3-5, Various additional details on offsite emergency response measures
- 13.3-7, Guidance and authority for exceeding exposure limits
- 13.3-8, Capabilities of hospital and emergency services
- 13.3-9, Qualification for directors of emergency response
- 13.3-10, Cross-references to NUREG-0654 Supplement 2 and review of Orange County emergency response program

Applicant has provided information to address the above open items, and staff has no additional questions on them



Open Items

- 13.3-3, Adequacy of technical support center, emergency operations facility, and operational support center
 - Applicant does not plan to provide details on these subjects and plans to withdraw request for the associated major feature
- 13.3-6, Additional information on evacuation time estimate (ETE)
 - Applicant referenced existing NAPS ETE
 - Staff has a number of questions on details of the plan
 - Dominion is reviewing document against staff questions



COL Action Items

- Identify/highlight work needed at COL
- Similar to established concept in design certifications
- Regulatory standing under discussion (unlike design certification, not written into a rule)
- Not all-inclusive
- Applicant believes some are unnecessary when already required by regulations
- Specific items in backup slides
- Based on staff's evaluation of open item responses, some of these items may be changed or deleted in FSER



Proposed Permit Conditions

- Should an ESP be issued for the site, NRC staff believes the ESP holder needs to be constrained by these conditions
- Based on staff's evaluation of open item responses, some of these items may be changed or deleted in FSER
- May also reclassify some of these as COL action items
- Dominion plans to identify technical concerns with some of these items



Proposed Permit Conditions

- 2.4-3, Design slopes based on drainage without need for engineered drainage systems that can be blocked
- 2.4-4, Locate safety-related facilities above maximum water level from local intense precipitation
- 2.4-5, Minimum free-surface elevation of UHS
 - This item may be revised based on applicant's response to open item 2.4-6
- 2.4-6, Minimum UHS storage capability
- 2.4-7, Design UHS capacity to address potential for freezing



Proposed Permit Conditions

- 2.4-8, No reliance on Lake Anna for safety-related water supply
- 2.4-9, Locate ingress/egress opening for safety-related SSCs above 271 ft MSL
- 2.4-10, Provide erosion protection for slopes at intake
- 2.4-11, No compromise of flood control measures for existing NAPS units during construction of new units
- 2.4-12, Locate new units where ground water level does not exceed 270 ft MSL
 - Dominion believes appropriate condition is distance above water table



Proposed Permit Conditions

- 2.5-1, Replace fractured/weathered rock at foundations
- 2.5-2, Perform additional borings to identify weathered or fractured rock at foundations
- 2.5-3, Do not use saprolite as engineered fill
- 2.5-4, Perform geologic mapping of future excavations for safety-related facilities
- 2.5-5, Improve Zone II saprolitic soils if locating safety-related structures on them



DSER Conclusions

- DSER defers general regulatory conclusion regarding site suitability to FSER after open items addressed
- Some conclusions from individual sections without open items
 - Applicant has provided appropriate quality assurance measures equivalent to those in 10 CFR Part 50 Appendix B
 - Site characteristics are such that adequate security plans and measures can be developed



DSER Conclusions

- Additional conclusions from individual sections without open items
 - Population center distance, as defined in 10 CFR 100.3, is at least one and one-third times the distance from the reactor to the outer boundary of the low population zone and compliant with 10 CFR 100.21(b) and (h)
 - Applicant has established appropriate atmospheric dispersion characteristics to support radiological calculations
 - Based on PPE and site characteristics, site meets radiological dose consequence criteria in 10 CFR 50.34(a)(1)



DSER Conclusions

- Additional conclusion from individual section without open items
 - Potential hazards associated with nearby transportation routes, industrial and military facilities pose no undue risk to facility that might be constructed on the site



Presentation Conclusions

- Staff has issued first-of-a-kind DSER for North Anna ESP application
- Most open item responses expected by March 3, 2005
- Because of first-of-a-kind nature of this action, staff is working through some issues identified during the review
- Looking forward to seeing interim ACRS letter and to briefing the Subcommittee and the full Committee this summer on final results of staff's review of this application
- Staff is identifying lessons learned for possible inputs to future rulemakings and revisions to guidance



Backup Slides



COL Action Items

- 2.1-1, Specific unit locations
- 2.1-2, Agency control of water bodies within exclusion area
- 2.2-1, Hazards of nearby industrial area
 - Currently undeveloped
 - Zoning could permit hazardous operations in future
- 2.2-2, Design-specific interactions between NAPS and new facility
 - Depends on layout and design of new units



COL Action Items

- 2.3-1, Dispersion of radionuclides to control room
- 2.3-2, Release point characteristics and receptor locations for routine release dose computations
- 2.4-1, Restriction on operations posed by low-water conditions
- 2.5-1, Additional soil borings
- 2.5-2, Compare plot plans with subsurface profile and material properties
- 2.5-3, Submit excavation and backfill plans



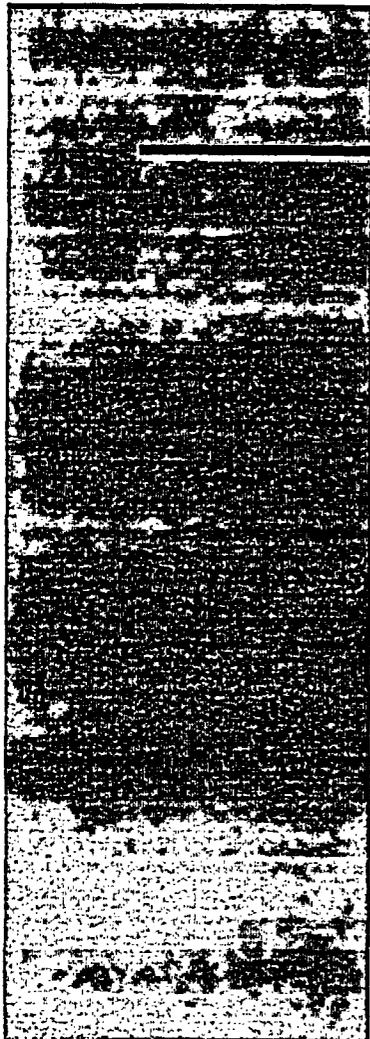
COL Action Items

- 2.5-4, Evaluate groundwater impact on foundation stability and dewatering plans
- 2.5-5, Perform soil column amplification/attenuation analyses
- 2.5-6, Analyze stability of safety-related structures
- 2.5-7, Provide design-related structural criteria
- 2.5-8, Provide plans for ground improvement
- 2.5-9, Verify average shear-wave velocity of materials underlying containment



COL Action Items

- 2.5-10, Provide more detailed slope stability analysis
- 2.5-11, Provide plans for safety-related slopes
- 13.6-1, Provide designs for protected area barriers



North Anna Early Site Permit Application

ACRS Ad Hoc Subcommittee
on Early Site Permits
March 2, 2005



North Anna ESP Chronology

Submitted ESP Application	Sept. 2003
Revision 1	Oct. 2003
Revision 2	July 2004
Revision 3	Sept. 2004
NRC Issued Draft SER	Dec. 2004
Response to DSER Open Items	March 2005

Activities Since DSER Issued

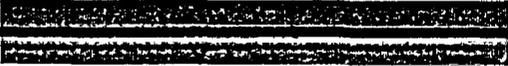
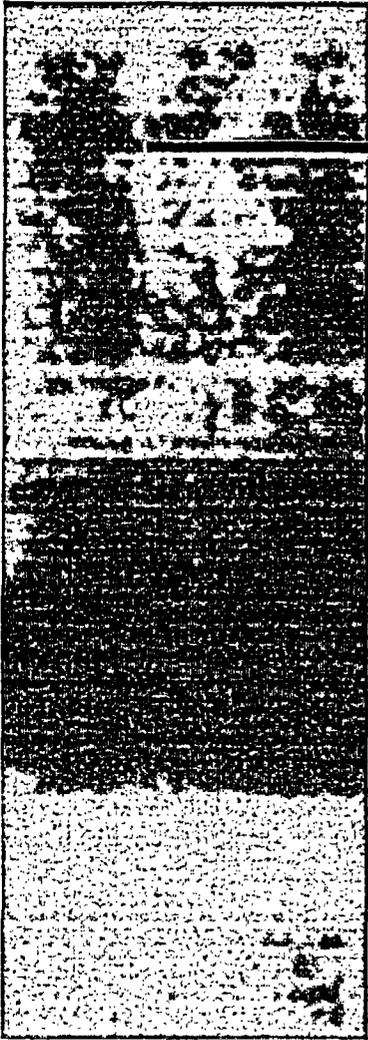
- One seismic open item response submitted January 25, 2005 (ML050320090)
- Dominion submitted feedback on DSER (ML050410133)
- Several phone calls to discuss open items and feedback
- Planned approach on second seismic open item submitted February 18, 2005
- Public meeting held February 23, 2005



Technical Issues

- Technical resolution for ESP issues appears achievable
- Additional information on seismic to be provided
- Permit conditions/action items need to be clear, concise and unambiguous
 - Based on objective criteria
 - Stand the test of time





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