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NUCLEAR REGULATORY COMMISSION

Title: Grand Gulf Early Site Permit Hearing

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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ATOMIC SAFETY AND LICENSING BOARD

HEARING

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In the Matter of: :
SYSTEM ENERGY RESOURCES, INC. : Docket No.
: 52-009-ESP
(Early Site Permit for :
Grand Gulf ESP Site) : VOLUME II

-----x

Third Floor Hearing Room
Two White Flint North
11555 Rockville Pike
Rockville, Maryland

Thursday, November 30, 2006

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

BEFORE:

- THE HONORABLE LAWRENCE G. McDADE, Chairman
- THE HONORABLE NICHOLAS G. TRIKOUROS
- THE HONORABLE RICHARD E. WARDWELL

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1 APPEARANCES:

2 On Behalf of the Applicant:

3 KATHRYN M. SUTTON, ESQ.

4 PAUL BESSETTE, ESQ.

5 MARTIN J. O'NEILL, ESQ.

6 Of: Morgan, Lewis & Bockius, LLP

7 1111 Pennsylvania Avenue, N.W.

8 Washington, D.C. 20004

9 (202) 739-5738

10

11 On Behalf of the NRC:

12 JONATHAN RUND, ESQ.

13 ANN HODGDON, ESQ.

14 PATRICK MOULDING, ESQ.

15 ROBERT WEISMAN, ESQ.

16 Office of the General Counsel

17 U.S. Nuclear Regulatory Commission

18 Mail Stop 015 D21

19 Washington, D.C. 20555

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E X H I B I T S

	<u>NO.</u>	<u>IDENT.</u>	<u>REC'D</u>
1			
2			
3	<u>SERI's:</u>		
4	8	325	325
5	32	324	324
6	32 and 33	477	477
7			
8	<u>Staff's:</u>		
9	47 through 50	321	321
10	51	326	326
11	52	465	465
12	53	570	570
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P R O C E E D I N G S

(9:04 a.m.)

1
2
3 JUDGE McDADE: Okay. The hearing will
4 come to order.

5 Before we begin with the presentation of
6 witnesses today, there are a couple of preliminaries
7 that I wanted to raise. The first has to do with
8 exhibits, and what I would like to have done is this.
9 At the conclusion of the hearing, when all of the
10 exhibits have been admitted for both the staff and the
11 Applicant to prepare an updated exhibit list; to then
12 mark that exhibit list as respectively Staff Exhibit
13 1(a), Applicant Exhibit or SERI Exhibit 1(a), and then
14 just E-mail it to the court reporter and to Ms. Wolf
15 so that we will be able to have that right on top of
16 all of the exhibits, and anybody who is following it
17 will have a full updated list.

18 For example, the index that you gave us
19 yesterday was all of the exhibits that at that time
20 you believed were going to be admitted. Each of you
21 had one additional exhibit yesterday, and I assume
22 there will probably be additional exhibits offered
23 today that will augment that.

24 So that's one preliminary. The other
25 preliminary has to do with the transcript. There were

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1 an awful lot of people talking, an awful lot of
2 technical jargon yesterday. There is a possibility
3 that there may be mistakes in the transcript, and
4 before we issue an opinion, we can't have a moving
5 target.

6 So what we need to do is to have the
7 witnesses review the transcript and correct any errors
8 that they believe exist in it, and what we want to do
9 is, and I don't necessarily need it right now, but
10 what I would like you to do is to talk with your
11 witnesses, both the ones who were there yesterday and
12 the ones who will be here today and find out what they
13 think is a reasonable period within which they would
14 be able to review the transcript, make any
15 corrections, get it back to you all, and then get it
16 to us.

17 Because we simply are not going to be in
18 a position to write a final opinion in this particular
19 case until we know exactly what the transcript is
20 going to look like. We don't want to make a decision
21 based on what's in the transcript and then find out
22 that our recollection based on that was incorrect.

23 So as I said, I don't necessarily need
24 that right now. I know witnesses have travel
25 schedules. They have other kinds of commitments. So

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1 what I want to do is just get from you all what you
2 think is a reasonable period within which they can get
3 it back and from your standpoint, taking into
4 consideration you're not going to see our opinion
5 until some time after that occurs.

6 MS. SUTTON: Your Honor, I'm assuming we
7 can get a copy of the transcript to review immediately
8 after the hearing.

9 JUDGE McDADE: Well, you can get it. You
10 know, you can order it from the court reporter. The
11 sooner you get it, I know they have different charges
12 of whether you want it the next day, three days, seven
13 days. You know, I would urge it not it not to be too
14 long.

15 MS. SUTTON: No, we will do that
16 immediately. Thank you.

17 MR. RUND: As will we.

18 JUDGE McDADE: Okay. Before we get
19 started today, are there any other exhibits at this
20 point that were not referenced or marked or received
21 yesterday that you anticipate are going to be
22 presented during the course today that we can take
23 care of at this time from the staff?

24 MR. RUND: I apologize. Yes, we have
25 several new exhibits. We have three of the figures

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1 from the engineering report which we've marked as
2 Staff 47, 48, and 49, and Staff --

3 JUDGE McDADE: And when you say the
4 engineering report, you're talking about SERI
5 engineering report dash, 02?

6 MR. RUND: Yes, that's the engineering
7 report that's mentioned in the prefiled testimony on
8 hearing Issue D. And that is an Entergy report.

9 We also have Staff Exhibit 50, which is
10 the draft model early site permit. I have copies of
11 those, and they are pre-marked, stamped, and I'd like
12 to submit those now.

13 JUDGE McDADE: Okay. Has the Applicant
14 had an opportunity to review these?

15 MR. BESSETTE: Yes, we have.

16 JUDGE McDADE: Do you have any objection
17 to these?

18 MR. BESSETTE: No, we don't.

19 JUDGE McDADE: Okay. Staff Exhibits 47,
20 48, 49, and 50 are admitted. If you could, pass them
21 up please.

22 (Whereupon, the documents
23 referred to were marked as Staff
24 Exhibit No.s 47 through 50 for
25 identification and were received

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1 in evidence.)

2 JUDGE WARDWELL: While that is taking
3 place --

4 JUDGE McDADE: I was just going to say,
5 one thing that raises that yesterday with regard to
6 the engineering report, it was not available, the
7 entire report, and it was going to be made available
8 electronically at a later point in time.

9 Have you been able to secure an electronic
10 copy of that yet?

11 MR. BESSETTE: Your Honor, the staff had
12 referenced that report, and they only referenced
13 certain figures, and we provided those figures to the
14 staff. We did not think it was necessary to admit the
15 whole report in unless the Board would like the whole
16 report because we did provide to the staff the
17 referenced pages and exhibits.

18 JUDGE McDADE: Okay. Well, let me put a
19 question to you all. I mean, if it's not admitted as
20 an exhibit, if we don't have it, it's not something
21 we're going to be able to rely on in rendering our
22 opinion. So the question arises of whether or not you
23 all either the staff or the applicant, thinks that in
24 any way the other portions of that report might be
25 helpful to us, might be important for us to consider

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1 and to use as a basis for our findings and
2 conclusions.

3 MR. BESSETTE: We'll coordinate with the
4 staff on that, and as appropriate, we'll provide you
5 with an electronic copy.

6 JUDGE McDADE: Okay. We'll revisit that
7 either at the beginning of the session this afternoon
8 or later in the proceeding.

9 JUDGE WARDWELL: I'm sorry. Did you say
10 that you will coordinate and will provide or
11 coordinate to decide whether you will provide?

12 MR. BESSETTE: We'll coordinate to decide
13 whether to provide.

14 JUDGE WARDWELL: Okay. The wrinkle from
15 my standpoint, I would like to see it because I know
16 it's referenced in Hearing Issue A without any
17 designation of a specific table or figure, but to me
18 that would allow me to go back into that and grab some
19 pieces out of it that may help support issues that I
20 need to, and I'd like to have that available.

21 MR. BESSETTE: We have it available.
22 We'll provide it. The report is large. It was just
23 a media storage issue.

24 JUDGE WARDWELL: I understand, sure.

25 MR. RUND: And the staff would have no

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1 objection to that being introduced.

2 JUDGE McDADE: Well, let me just indicate
3 then at this point in time the next SERI exhibit,
4 unless you already have something else already
5 premarked, the next SERI exhibit will be SERI Exhibit
6 32.

7 (Whereupon, the document referred
8 to was marked as SERI Exhibit No.
9 32 for identification and was
10 received in evidence.)

11 JUDGE McDADE: Do you have anything else
12 pre-marked before that?

13 MR. BESSETTE: Actually we had already
14 included it on our original exhibit list. SERI 8,
15 which we had provided just a cover sheet, and we will
16 just propose to provide the complete report as SERI 8.

17 With regard to additional exhibits, we
18 will have a few additional slides, two additional
19 exhibit as part of Hearing Issue G, but we're
20 currently marking them, and if it's satisfactory to
21 the Board, we'll present those as we get closer to
22 Issue G.

23 JUDGE McDADE: Okay.

24 MR. BESSETTE: We're stamping them now.

25 JUDGE McDADE: That would be fine, and

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1 just let me note for the record then, there being no
2 objection, SERI Exhibit 8, the index, will be modified
3 so that it will indicate that it's ER02, delete the
4 cover sheet only. The entire exhibit will be admitted
5 and it will be furnished --

6 MR. BESSETTE: We can do that at break.

7 JUDGE McDADE: -- when practicable.

8 MR. BESSETTE: Yes, thank you.

9 (Whereupon, the document referred
10 to was marked as SERI Exhibit No.
11 8 for identification and was
12 received in evidence.)

13 JUDGE McDADE: Okay? Any other
14 preliminaries before we get started with the taking of
15 testimony today?

16 MR. RUND: The staff has one more exhibit
17 that we plan on introducing later this afternoon.
18 It's a statement of professional qualifications for
19 Mike Scott, who we'd like to make available for the
20 presentation on Hearing Issue E. If the Board has any
21 questions, we think it would be beneficial to swear
22 them in when we get started in a little while, and
23 we'll provide his professional qualifications later
24 today.

25 JUDGE McDADE: Okay. That being the case,

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1 however, though what we would do -- ordinarily we have
2 not asked the witnesses to go through their
3 professional qualifications, but if we are going to
4 receive testimony from them, we're going to have to
5 have something in in front of us indicating that they
6 are, in fact, an expert in some particular area now,
7 and an area on which they are going to offer testimony
8 so that we can accept their opinion testimony.

9 So what we would do is just ask Mr. or Dr.
10 Scott to very briefly state his professional
11 qualifications for the record, and then we will admit
12 Exhibit 51, and it will be furnished as soon as
13 practicable.

14 But Exhibit 51, there being no objection,
15 is admitted, and after Mr. or Dr. Scott states their
16 qualifications, we'll asked the Applicant whether or
17 not they have any objection to our receiving his
18 testimony as an expert.

19 MR. RUND: Thank you.

20 (Whereupon, the document referred
21 to was marked as Staff Exhibit
22 No. 51 for identification and was
23 received in evidence.)

24 MR. RUND: Additionally, with regard to
25 Staff Exhibit No. 60, the draft model early site

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1 permit, counsel for the staff is prepared to walk the
2 Board through and explain the reasoning behind what's
3 in that, and we can either do that now or it may be
4 more appropriate to do it once we get to Hearing Issue
5 G.

6 JUDGE McDADE: Well, actually I think it
7 might be more appropriate for us to take that up right
8 at the end. That's going to simply be counsel
9 describing something for us. Let's get the witnesses
10 out of the way and not hold up witnesses while we're
11 doing that.

12 MR. RUND: While we're discussing holding
13 up witnesses, yesterday we had a couple questions that
14 seemed to deal with some of the questions the Board
15 had with regard to Hearing Issue H, permanent
16 condition 2 and sheer wave velocity. We had planned
17 originally to have that in the presentation on Hearing
18 Issue H.

19 If that was covered to the Board's
20 satisfaction, I think we'd like to know if we could
21 release our witnesses, specifically Dr. Constantino.
22 We're prepared to have him stay, stick around until we
23 come to that hearing issue, but it seemed as if the
24 sheer wave velocity issue was covered and discussed
25 yesterday, and if that was done to the Board's

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1 satisfaction, we'd like to know if we could let him go
2 today.

3 JUDGE McDADE: Where physically is he
4 right now? Is he in the room?

5 MR. RUND: He's next door in One White
6 Flint.

7 JUDGE McDADE: What I would propose to do
8 is this, and rather than sort of do this on the fly
9 and make a mistake, I anticipate we'll probably take
10 about a 15 minute break at 10:30 or a good break
11 position at that point.

12 At that point the members of the Board
13 will review what additional questions we have in that
14 area to see whether or not they were answered based on
15 the testimony yesterday and whether or not he can be
16 released.

17 MR. RUND: Thank you.

18 JUDGE WARDWELL: To help in that effort,
19 considering our Chair may very well ask someone like
20 myself whether or not sufficient information has bene
21 provided in this area. As I look at H, where this
22 comes up is not so much in the technical discussion of
23 that particular parameter, but how will that parameter
24 be assured and carried over to the COL stage from the
25 ESP stage.

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1 And can you provide me with an indication
2 of what you're planning to present to us and why a
3 technical person is needed in regards to addressing
4 the carryover from the ESP to the COL, which is really
5 the heart of Issue H, not so much the technical
6 discussion of that particular parameter.

7 MR. RUND: We wanted to be able to have a
8 technical person available just in case we got into
9 the technical feasibility and verification process and
10 any of that. So although I do understand it's
11 somewhat of a process question, there are some
12 technical aspects that we'd like to have our technical
13 experts around for.

14 JUDGE WARDWELL: Well, that raises the
15 other question I had for you. That particular witness
16 may provide more assistance when we get to the very
17 last issue, which is where we go through all of the
18 questions to make sure that we've covered all of them
19 that we have asked before and we have replies based on
20 your initial responses.

21 And so you anticipate that person, once
22 you release him, were you anticipating on releasing
23 him to the winds of the world to head back west or
24 were you planning on releasing him to go to the
25 Marriott and relax?

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1 MR. RUND: Given that the Board will be
2 asking those questions at the end, I don't think we
3 will be releasing anybody westward or north or in any
4 direction too far.

5 JUDGE WARDWELL: I think that might be
6 good. My plans, and I hope to be able to do this and
7 with the rest of the panel we have to see whether
8 we've got time to do it, but the idea with that, to
9 give you a highlight is I'm going to try to go through
10 it and cross out those board replies that I think
11 we've already covered, and I looked at it last night
12 and this morning, and we have covered an awful lot of
13 them.

14 I wish I had gotten further along and then
15 discussed it with the Board so that I could give you
16 some assistance in regard to whether or not that
17 particular individual will be needed because I think
18 my initial estimate would be no because of the
19 extensiveness with which we went through it yesterday,
20 but I can't guarantee it at this point. That's the
21 sad part.

22 MR. RUND: And that's fine. We're
23 prepared to have people stay through the end if the
24 Board wishes.

25 JUDGE McDADE: Are we ready to proceed

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1 with the next hearing issue?

2 MR. RUND: Yes.

3 JUDGE McDADE: Okay. Would you introduce
4 your witnesses for us?

5 MR. RUND: For presentation on Hearing
6 Issue E, which deals with alternatives, the staff
7 calls James Wilson, Paul Hendrickson, Lance Vail, and
8 Mike Scott.

9 I'd ask that all of you introduce
10 yourselves for the record.

11 MR. VAIL: I'm Lance Fail.

12 MR. WILSON: I'm Jim Wilson.

13 MR. HENDRICKSON: And my name is Paul
14 Hendrickson.

15 MR. SCOTT: And I'm Mike Scott.

16 JUDGE McDADE: Okay, and for the
17 Applicant?

18 MS. SUTTON: For the Applicant on Hearing
19 Issue E we have John Cesare, George Zinke, Kyle
20 Turner, and Michael Bourgeois.

21 If you gentlemen will introduce
22 yourselves, please.

23 MR. CESARE: I'm John Cesare.

24 MR. BOURGEOIS: Michael Bourgeois.

25 MR. TURNER: Kyle Turner.

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1 MR. ZINKE: George Zinke.

2 JUDGE McDADE: Okay. Thank you.

3 I know Mr. Zinke was here yesterday. The
4 other individuals who have not been sworn, if you
5 could please rise.

6 (Whereupon, the witnesses were duly
7 sworn.)

8 JUDGE McDADE: Okay. You are under oath.

9 We would ask initially if perhaps Dr.
10 Scott or Mr. Scott, if you could very briefly go
11 through your qualifications by way of education and
12 experience.

13 WITNESS SCOTT: Okay. My name again is
14 Mike Scott. I hold a Ph.D. in economics from the
15 University of Washington in 1975.

16 I've been on the staff at the Pacific
17 Northwest National Laboratory since January of 1980.
18 In that capacity, I've worked on a number of
19 socioeconomic impact assessments, regional economic
20 analyses for a number of clients over the years.

21 Prior to that, between my education at
22 Washington and my arrival at Pacific Northwest
23 National Laboratory, I was on the staff of the
24 Institute of Social and Economic Research at the
25 University of Alaska where I conducted economic and

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1 social impact analyses in Alaska.

2 JUDGE McDADE: Okay, and specifically,
3 your Ph.D. is in what area?

4 WITNESS SCOTT: Economics, sir.

5 JUDGE McDADE: Okay. Does the Applicant
6 have any objection to our receiving Dr. Scott as an
7 expert witness?

8 MS. SUTTON: We do not, Your Honor.

9 JUDGE McDADE: Okay. All of the witnesses
10 are accepted as expert witnesses, and we will accept
11 opinion testimony in their areas of expertise from
12 them.

13 Are we ready to proceed?

14 MR. RUND: Yes, we are.

15 JUDGE McDADE: Okay.

16 MR. RUND: Staff has no opening statement,
17 but our panel is prepared for their presentation and
18 they would like to begin.

19 JUDGE McDADE: Okay. Just one thing.
20 Again, it's important that we keep a record of this so
21 that when you do speak now the court reporter may or
22 may not remember your names based on your initial
23 introduction. So, please, just as you begin to speak,
24 state your name so that that particular statement will
25 be attributed to the right person. It may be down the

1 road that one of your colleagues may say something
2 that you don't agree with and you don't want you to
3 have that attributed to you. So make sure that you
4 give your name and that way the statement will be
5 attributed to the correct witness.

6 Please proceed.

7 WITNESS WILSON: Okay. I'm referring to
8 the slides at Staff Exhibit 15.

9 JUDGE McDADE: Again, your name, for the
10 reporter?

11 WITNESS WILSON: My name is Jim Wilson.
12 I'm the project manager for the staff's environmental
13 review of SERI's application for an early site permit
14 at the Grand Gulf site.

15 I'm going to provide a brief overview of
16 the staff's evaluation of alternatives. I'm also
17 going to try to explain some of the jargon that we use
18 a lot when we talk about these issues.

19 Chapter 8 of the staff's EIS describes
20 alternatives to the proposed action and discusses the
21 environmental impacts of those alternatives. The
22 evaluation of alternative sites is a two-step process,
23 as set forth in NUREG 1555, the environmental standard
24 review plan, and this process stems from the NRC
25 decision related to the licensing of the Seabrook

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1 Nuclear Power Plant.

2 Conceptually, the first step of the
3 process looks at a full suite of environmental issues
4 using reconnaissance level information to determine if
5 any of the alternative sites are environmentally
6 preferable to the Grand Gulf ESP site.

7 Oh, wow, I just said a whole mouthful of
8 terms. Let me go on to explain a little bit about
9 what we mean when we say the staff looked at a full
10 suite of environmental issues for the construction,
11 operation of one or more new nuclear units.

12 Remember SERI proposed a PPE, a plant
13 parameter envelope, in place of a specific design. So
14 when the staff evaluated the construction impacts at
15 Grand Gulf and at the alternative sites, the staff
16 treated the facility itself as a black box that was to
17 be built on a particular footprint that would disturb
18 plant and animal communities in certain areas; that
19 would use a certain number of construction workers who
20 would live in certain areas and need certain services
21 and infrastructure and who would pay taxes and spend
22 their salaries in a local economy, and so on.

23 When the staff assessed the operating
24 impacts, again, at Grand Gulf and at each of the
25 alternative sites, they again treated the facility as

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1 a black box that sucked in a certain amount of water,
2 discharged a certain amount of heat and certain
3 chemicals within limits that would be regulated by
4 state and other agencies. It would release specific
5 radionuclides as effluents. It would be operated by
6 a staff of a certain size who would, again, live in
7 areas near the plant who would need services and
8 infrastructure, who would pay taxes and spend their
9 incomes also, and then the facilities themselves would
10 pay big bucks in taxes into the local economy.

11 Now, what do I mean by using
12 reconnaissance level information? What we mean by
13 this is that no new studies would be conducted. The
14 staff used existing information available from a large
15 number of sources, including other government
16 agencies, from academic institutions, from local
17 sources, from literature, and from the Applicant.

18 In the case of all of the alternative
19 sites, they coincidentally happened to be owned by the
20 Applicant and were collocated on sites with existing
21 operating nuclear power plants that had already been
22 approved, albeit for other designs, and none of which
23 had ever been built.

24 So the use of reconnaissance level
25 information in this analysis was not a particular

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1 hardship. There was a lot of information that the
2 staff accessed in performing its review of the
3 potential impacts of construction operation on these
4 sites.

5 What do we mean by environmentally
6 preferable? Environmentally preferred alternative
7 sites is a site for which the environmental impacts
8 are sufficiently less than for the proposed site such
9 that the environmental preference for the alternative
10 site can be established.

11 Okay. Let's get back to what's in Chapter
12 8 of the staff's EIS. Assuming that one or more of
13 the alternative sites were found to be environmentally
14 preferable, the second step of the process would
15 consider economic, technical, technological and
16 institutional factors among the environmentally
17 preferred sites to determine if any of the sites is
18 obviously superior to the proposed site.

19 If no obviously superior site exists, then
20 the proposed site prevails. At this point I'd like to
21 note that the staff conclusion is that the alternative
22 site is -- at this point a conclusion that an
23 alternative site is obviously superior to a proposed
24 site would normally lead to a recommendation by the
25 staff that the ESP application be denied. This was

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1 not the case at Grand Gulf.

2 The first step of our process found that
3 none of the alternative sites were environmentally
4 preferable. Therefore, we didn't get to step two and
5 consider any of the economic, technological or other
6 institutional factors.

7 The environmental impacts of the
8 alternatives, including alternative sites, were
9 evaluated using the same three level standard of
10 significance the staff used throughout its EIS of
11 small, moderate, and large based on CEQ guidelines.

12 Because the regulations do not require
13 that an EIS early site permit include consideration of
14 the benefits of construction operation of one or more
15 reactors at the ESP site, the Grand Gulf EIS did not
16 consider such matters. Therefore, should the NRC
17 issue an early site permit for the Grand Gulf site,
18 these matters would be considered at an EIS before any
19 construction permit or operating license were issued
20 related to an application that references this ESP.

21 Section 8.1 of the Grand Gulf EIS
22 discusses the no action alternative. Section 8.2 of
23 the EIS addresses alternative energy sources, and Paul
24 Hendrickson of Pacific Northwest National Lab will be
25 talking to you in a few minutes about alternatives for

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1 power generation.

2 Lance Vail of PNNL will be talking to you
3 in a few minutes about Section 8.3 of the EIS and
4 explaining the staff's review with respect to plant
5 design alternatives.

6 Section 8.4 of the EIS discusses SERI's
7 region of interest and examines its suitability and
8 the suitability of SERI's alternative site selection
9 process, as well as the method SERI used to select the
10 candidate and alternative sites. Section 8.4 also
11 examines issues that are common to all of the
12 alternative sites and addresses them collectively for
13 all of the sites.

14 Paul Hendrickson will be talking to you in
15 a few minutes about SERI's site selection process from
16 Section 8.4, as well as the staff's evaluation of the
17 environmental impacts from the alternative sites,
18 River Bend, FitzPatrick and Pilgrim, which are found
19 in Section 8.5 of this EIS.

20 The actual comparison of the alternative
21 sites with the Grand Gulf ESP site is made in Chapter
22 9 and is summarized in Table 9-1 for construction
23 impacts and Table 9-2 for operational impacts.

24 Now, Paul Hendrickson will provide a brief
25 discussion of alternative to power generation.

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1 WITNESS HENDRICKSON: Thank you, Jim.

2 My name is Paul Hendrickson. I'm a staff
3 member at the Pacific Northwest National Laboratory
4 out in the State of Washington.

5 I'm going to be talking about energy and
6 site alternatives. In between those, Lance Vail will
7 discuss plant design alternatives.

8 By way of background, before we get
9 started --

10 JUDGE McDADE: Excuse me one second before
11 you do. I just want to make sure it's clear from the
12 record that the exhibit that you're putting up is part
13 of Staff Exhibit 15.

14 Please continue.

15 WITNESS HENDRICKSON: Okay. By way of
16 background, the basis for the examination of
17 alternatives in EIS stems from Section 102(2)(c) of
18 NEAP, which requires preparation of an EIS
19 significantly affecting the quality of the human
20 environment and also specifies that the EIS is to
21 cover alternatives to the proposed action.

22 NRC's regulations implementing NEPA are
23 found in 10 CFR Part 51, and those regulations call
24 for presentation of alternatives in an NRC EIS in a
25 comparative form. It also states that all reasonable

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1 alternatives are to be identified.

2 The early site permit regulations in 10
3 CFR Part 52 call for an ESP environmental report to
4 include evaluation of alternative sites to determine
5 whether there is an obviously superior site.

6 If an ESP were to be granted to the
7 Applicant, it would not authorize construction in this
8 case, but nevertheless, consistent with CEQ
9 regulations, the final environmental impact statement
10 considers potential construction and operational
11 impacts at both Grand Gulf and at the alternative
12 sites because significance cannot be avoided by
13 terming an action temporary or by breaking it down
14 into small component parts.

15 In the alternative analysis in Chapter 8
16 of the EIS, three categories of alternatives are
17 considered: energy alternatives, plant design
18 alternatives which includes heat dissipational systems
19 and circulating water systems, and also alternative
20 sites.

21 These categories of alternatives are
22 generally consistent with those used by NRC in
23 environmental impact statements that were prepared in
24 the 1970s and 1980s for generation of nuclear power
25 plants.

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1 JUDGE TRIKOUROS: The heat dissipation
2 systems alternatives includes both the normal heat
3 sink as well as the ultimate heat sink?

4 WITNESS VAIL: No, we just focused on
5 normal heat sink.

6 JUDGE McDADE: And, again, can you please
7 before you speak just state your name for the record?

8 WITNESS VAIL: My name is Lance Vail.

9 WITNESS HENDRICKSON: Starting first with
10 energy alternatives, the Commission informed the
11 various applicants for early site permits in a June
12 2003 letter that an ESP application need not include
13 an assessment of alternative energy sources.

14 The Applicant in this case, SERI, elected
15 to include an analysis of energy alternatives in its
16 environmental report. It's environmental report, as
17 well as the EIS, considered energy alternatives
18 involving and not involving new generating capacity.

19 In the EIS staff used a target value of
20 2,000 megawatt electric in analyzing alternative
21 energy sources, and this figure of 2,000 megawatt
22 electric is consistent with what was included in the
23 SERI environmental report.

24 JUDGE TRIKOUROS: And that issue of 2,000-
25 megawatts electric versus 3,000 megawatts electric,

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1 the findings of fact and conclusions of law indicate
2 an 8,600 megawatt thermal, 3,000 megawatt electric
3 combination. Is the 2,000 megawatts electric
4 appropriate for this type of an evaluation because it
5 is, in fact, a conservative evaluation to compare to
6 a lesser electrical energy or is the megawatts thermal
7 really the key here, not the megawatts electric?

8 WITNESS WILSON: Jim Wilson for the staff.

9 The target that Paul used in his analysis
10 was to set a minimum level of electrical generating
11 capacity to let him size the alternative energy
12 sources. It was not written into our EIS to reflect
13 that it's a maximum value.

14 In order to get 2,000 megawatts electric
15 as a target that was established by SERI, it means
16 that you would need at least two of any of the large
17 certified designs or alternative designs that are in
18 the PPE.

19 JUDGE TRIKOUROS: Well, what I'm getting
20 at is let's assume that one plant is built and that
21 it's an ABWR of 4,300 megawatts thermal, 1,500
22 megawatts electric. Then is the alternative analysis
23 appropriate in the sense that it is not the minimum
24 comparative point. It is the higher level. In fact,
25 it isn't the highest level, but it is not the minimum.

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1 WITNESS WILSON: Well, as we'll get to
2 later on, the staff's characterization of impacts will
3 show that a nuclear power plant would compare
4 favorably with alternative energy sources at 2,000
5 megawatt electric.

6 If the alternative energy sources had been
7 done at 3,000 megawatt electric, the nuclear would
8 compare even more favorably.

9 JUDGE TRIKOUROS: I understand, but would
10 it compare favorably to a 1,500 megawatt electric
11 plant?

12 If you do an evaluation as you did of,
13 say, a coal plant and you look at a 2,000 megawatt
14 electric coal plant and you end up building a 1,500
15 megawatt electric nuclear plant, have you done an
16 alternative that is then one for one or have you done
17 an alternative that is assuming the most you can
18 build on the site as opposed to the least that you can
19 build on the site?

20 For example, what if a PBMR of 150
21 megawatts electric is put on the site? So how do you
22 justify this minimum concept versus maximum concept?
23 When I was looking through all of this, this is what
24 was striking me as I was reviewing it.

25 WITNESS HENDRICKSON: Well, perhaps the

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1 Applicant would like -- I mean, the 2000 figure came
2 from the Applicant. Perhaps they'd like to address
3 this issue.

4 WITNESS CESARE: John Cesare with the
5 Applicant.

6 Your Honor, the alternate energy source
7 evaluation required a comparison of like quantities,
8 apples to apples. So at first start we used the
9 target site capacity to generate the PPE black box of
10 the surrogate plant. The 2,000 megawatt electric
11 target capacity was used in the alternate energy
12 evaluation to establish an appropriate level of coal
13 or natural gas generators that one could compare with
14 the proposed nuclear project.

15 The environmental impacts associated with
16 four coal plants at 500 megawatts, 508 generating
17 approximately 2,000 megawatts, that generates a
18 certain amount of land use, air quality impacts, water
19 use, et cetera.

20 We compared that with the proposed nuclear
21 plant which was generated based on a multiple of
22 whatever appropriate levels of units or modules of
23 this range of nuclear plants that would be necessary
24 to achieve target capacity. So when we ended up
25 comparing impacts in all cases, the environmental

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1 impacts were based on a megawatt electric generating
2 capacity, was greater for the proposed project. So we
3 felt that was conservative in that respect.

4 JUDGE TRIKOUROS: Would you be able to say
5 that it's linear in the sense that if you built a
6 1,500 megawatt electric nuclear plant and you did your
7 evaluation on the basis of 1,500 megawatts electric
8 for all the alternatives, you'd end up with the same
9 conclusion and then linearize that down to 1,000
10 megawatts electric? Would you still be able to draw
11 the same conclusion?

12 That's really where I'm coming from. You
13 did it at 2,000 megawatts electric, which was
14 appropriate rather than 3,000 electric for this type
15 of thing, I would think, but you didn't do it for less
16 than 2,000. So that's my question.

17 You don't necessarily have to answer it
18 now, if you can't, but that's the question I'd like to
19 get at least your opinion on.

20 JUDGE WARDWELL: Can I tack on a sub-
21 question onto that?

22 WITNESS WILSON: Jim Wilson for the staff.

23 Let me answer that question first and then
24 maybe you can tier off of it.

25 The staff used the 2,000 megawatt electric

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1 target only for the alternative energy source
2 analysis, and we did that only for the Grand Gulf
3 site. For the alternative sites, we used an 8,600
4 megawatt thermal PPE plant on each of the alternative
5 sites for the purpose of comparison with Grand Gulf.
6 We did not do alternative energy analyses for the
7 alternative sites; just for comparison with the
8 proposed action at the Grand Gulf site.

9 So does that help?

10 JUDGE TRIKOUROS: Well, I would like
11 somebody to be able to say to me that no matter what
12 size nuclear power plant was built, that the
13 alternative evaluation that was done, if it were done
14 on a one for one with that nuclear power, would reach
15 the same conclusions. That's what I'm looking for.

16 JUDGE WARDWELL: Or would, in fact, if you
17 can't make that extrapolation, would this not say that
18 at the COL stage if the Applicant was proposing a
19 1,500 megawatt electric plan, they would have to redo
20 the EIS based on that plant looking at alternative
21 energy sources at the levels that are being proposed
22 for the site, question mark?

23 JUDGE McDADE: Dr. Cesare, can you answer
24 that?

25 WITNESS CESARE: Your Honor, Mr. Cesare.

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1 I will attempt to answer it, and there may
2 be a necessity to caucus.

3 The proposed project is for a target site
4 capacity of 2,000, and that is the project, for 2,000
5 megawatts electric.

6 JUDGE WARDWELL: For the ESP application.

7 WITNESS CESARE: Yes, Your Honor. The
8 primary impacts are scaled based on 1,000. We asked
9 the vendors to give us their recommended combinations
10 of modules or units for this range reactors that would
11 generate approximately 1,000 megawatts electric.

12 So we would then say that the vendors, our
13 proposed project would most likely be that family of
14 reactors that would be at the 1,000 megawatt electric
15 level.

16 The next step was to say how many reactors
17 or modules do we require to achieve the target
18 capacity of 2,000 megawatts electric. So we doubled
19 the impacts where appropriate parameter by parameter
20 basis.

21 The key areas of impact, I believe, would
22 be linear in terms of land use, water use, heat
23 rejection and those type of things, those primary
24 interfaces with the environment, source terms. Those
25 things would be most likely scalable and would work at

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1 2,000 megawatts site capacity or 1,000 megawatts
2 electric.

3 So I believe that they would be comparable
4 at 1,000.

5 JUDGE WARDWELL: Does that say that, in
6 fact, if an applicant was going to propose a 1,000
7 megawatt plant for this site at the COL stage, is it
8 your feeling that the EIS would not have to be redone
9 for that?

10 WITNESS CESARE: John Cesare for the
11 Applicant.

12 The process requires that at COL we look
13 at major assumptions, documented in the EIS, and
14 important assumptions that we would also consider in
15 our environmental report, and for those things are to
16 resolve, we considered this alternate energy source to
17 be resolved sine it does conclude that there were no
18 superior energy alternatives.

19 JUDGE WARDWELL: Resolved for a 2,000
20 megawatt electric black box.

21 WITNESS CESARE: Correct, and we would
22 look through those assumptions and see if those
23 assumptions and see if those assumptions are still
24 valid and if they are not valid, we would interrogate
25 those assumptions and decide what the extent of the

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1 reanalysis revisiting aspect would be necessary.

2 It all then focuses on 51.50(c), new and
3 significant for resolved issues.

4 JUDGE WARDWELL: And we would write that
5 up and document it in the EIS for the COL.

6 WITNESS CESARE: The process would call
7 for us to do -- we are required to have a reasonable
8 process that reviews those assumptions and doing
9 whatever is necessary to look for new and significant
10 information for those issues that are resolved,
11 evaluate it if it's new, then evaluate it if it's
12 significant.

13 And if it's new and significant per
14 51.50(c), it must be in our supplemental environmental
15 report at COL.

16 JUDGE TRIKOUROS: You're telling me that
17 in five years if you build a 500 megawatt plant, that
18 you would have gone back and redone the alternatives
19 analysis?

20 My sense is that you wouldn't necessarily
21 do that. There's a sense that the higher value is
22 better, in general terms, it looks like. In fact, the
23 higher value is not better if you don't build the same
24 size nuclear plant. Therefore, I would like to see
25 something in writing that says you would do that, in

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1 fact, if you decide to build a smaller PBMR, for
2 example.

3 And your application allows all of the
4 above, the smallest PBMR up to the largest ESBWR.

5 WITNESS CESARE: John Cesare with the
6 Applicant.

7 WE would follow the process, Your Honor.
8 The process would -- if the proposed project were no
9 longer 2,000 megawatts but a lesser amount, we would
10 do the review that I just described and determine if
11 the alternate energy analysis would come up with a
12 different conclusion, comparing the 1,000 megawatt
13 electric plant with the alternatives that would
14 compare with that.

15 JUDGE McDADE: But would that alone
16 constitute new and significant? In other words, if
17 there were a change to 1,000, would that standing
18 alone in your view fit within the category of new and
19 significant under 51.56?

20 WITNESS CESARE: Your Honor, a change from
21 2,000 to 1,000?

22 JUDGE McDADE: Yes.

23 WITNESS CESARE: I would follow the
24 process. It would be new, but I don't know that it
25 would be significant, and therefore, it may not be

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1 evaluated further.

2 JUDGE McDADE: But for our purposes right
3 here, there's nothing specifically in the ESP that
4 addresses this. What you're saying is that you
5 believe that this is adequately addressed by 51.50(c).
6 If it fits within the definition of significant under
7 that regulation, it would then trigger the additional
8 analysis. If not, it would not.

9 WITNESS CESARE: We have evaluated the
10 proposed project at 2,000. That's a key assumption.
11 We have determined that those impacts are -- that the
12 alternatives that we looked at with those assumptions
13 were not environmentally preferable alternatives.

14 And I agree with your summation. I would
15 rely on the process for 51.50(c) to review assumptions
16 and determine if those assumptions would require a new
17 analysis to whatever extent.

18 MR. WEISMAN: I'm sorry, Your Honor. Bob
19 Weisman for the NRC staff.

20 I'd just like to make a clarification, and
21 that is the discussion has been speaking about Section
22 51.50(c). That is in a rule that is with the
23 Commission. It's not a final rule yet. However, the
24 staff would certainly agree that the NEPA case law
25 standard of new and significant would apply in any

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1 case in this circumstance.

2 JUDGE McDADE: Okay. Thank you.

3 JUDGE TRIKOUROS: I still am not satisfied
4 with the answer. The reason that you've requested an
5 application for this high level of thermal power and
6 a fairly high level of electrical power target is to
7 provide flexibility. You may not ever build 8,600
8 megawatts thermal on that site, and you would be
9 within your rights to do that.

10 And so the only question I'm asking, and
11 I'll ask it again: if you chose not to, then you're
12 telling me that you would go back and review the NEPA
13 requirement to look at comparable alternatives.

14 JUDGE WARDWELL: Do I have permission to
15 add onto your question?

16 JUDGE TRIKOUROS: You do.

17 JUDGE WARDWELL: And is it true that the
18 initial step in that process would be to evaluate
19 whether or not it's new and significant information,
20 and if it isn't new and significant, then the
21 continuation of the evaluation of alternative ceases
22 at that point.

23 If it is new and significant, then you
24 would, in fact, redo the alternatives analysis as
25 needed to address whatever is new and significant with

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1 the change in what is actually being built there.

2 WITNESS ZINKE: George Zinke with the
3 Applicant.

4 Let me step through, and I think I can
5 answer your question.

6 JUDGE WARDWELL: It might be better if you
7 answer the question first and then go on because what
8 happens is oftentimes the witness raises more
9 questions and we never get back to the original
10 question. So if you could just answer the question
11 first and then add to it, I think it would be helpful.

12 WITNESS ZINKE: I'm not sure I can do it
13 exactly that way.

14 JUDGE WARDWELL: Okay.

15 WITNESS ZINKE: If I can step through your
16 scenario of what happens, I think that is answering
17 your question.

18 We have submitted the application, and I
19 need to correct first one of the things you said. Our
20 application, early site permit, does not permit us to
21 build any particular technology. So it is not pre-
22 approving any technology as falling within the
23 parameters at this point.

24 JUDGE WARDWELL: Agreed.

25 WITNESS ZINKE: Okay. So given that, the

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1 alternatives analysis was based on the 2000 megawatt
2 electric. So at the point of COR when I'm referencing
3 the early site permit, I'm required to -- one of the
4 pieces I'm required to is look at the environmental
5 report and going forward and what is necessary.

6 So given that it's the 2,000 megawatt
7 electric that was used for the alternative analysis,
8 I'm picking a design. So in your scenario I picked
9 1,500. Fifteen hundred is new information because
10 it's not 2,000. That's the way we see it. It's new.
11 That's the first step.

12 I'm required to look at new and
13 significant, and so I'm stepping through that.

14 So I've got a piece of new information.
15 I'm picking 1,500, and I have to say is now the 1,500
16 bounded by what I analyzed, and as you have brought
17 up, the fact that in the alternatives lesser isn't
18 necessarily bounded. In some aspects greater isn't
19 necessary. So it's not just this number is less. So
20 I just go on.

21 I have to consider what is the thing. So
22 in alternatives, sometimes smaller wouldn't be
23 bounded. So in the evaluation in the next step, is
24 this new information significant?

25 I look at how it was used in the

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1 environmental report and the FEIS, and I have to make
2 a judgment of significance. In order to do that I
3 have to do some level of evaluation, of understanding
4 how it was used, what the impact is in order to
5 determine do I need to go further.

6 If by inspection -- and that's where we're
7 required to have a process that is auditable in
8 records where we would record and document that
9 evaluation of that issue.

10 In the definition of significance, then it
11 has to do with now is the impact of that new
12 information changing the conclusion because it said at
13 2,000 here was the conclusion. The nuclear, there
14 wasn't an alternative that was better.

15 So we have to say, well, would the
16 conclusion have been different if we had said 1,500.
17 If the conclusion would have been different, the
18 impacts would have been significantly different. Then
19 it is categorized significant.

20 Now, what that triggers is that then my
21 evaluation that I'm doing with regard to significance
22 goes beyond just being auditable that the NRC can look
23 it. It then physically goes into the application that
24 will then go to the Commission. But either way, there
25 was some form of evaluation done up to that point.

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1 So in your example of the 1,500, when we
2 look at what the 1,500 means relative to how it was
3 analyzed, and if we determine that the outcome of that
4 changes, we put it in the application, and then it
5 goes forward to say, now, ultimately how does that
6 individual parameter, the individual consequences, how
7 does that fit into the overall environmental report,
8 the FEIS that will follow in the overall conclusions?

9 JUDGE McDADE: Let me just interject
10 something here because I'm a little bit confused. I
11 mean, what we're trying to do is to determine whether
12 or not the alternatives analysis at this point has
13 been adequate.

14 The alternatives analysis has presumed
15 2,000 megawatts electric. That the permit would allow
16 other actions and as I understood the question from my
17 colleague, it was can we reasonably assume that the
18 impacts will be linear so that if you were to, as you
19 quite possibly could, go 1,000 megawatts electric,
20 would the impact be linear and, therefore, the
21 analysis that we can interpret from what we currently
22 have?

23 and you know, the question is: can we
24 make that determination right now or would the
25 significance of that change have to be addressed at a

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1 later period of time? And if so, how is it captured?
2 Is it adequately captured through existing law under
3 NEPA or under the proposed NRC regulation?

4 That is, at least as I understand it, the
5 thrust at least of my inquiry. Have I correctly
6 stated yours as well?

7 JUDGE TRIKOUROS: You have. You have.

8 WITNESS ZINKE: George Zinke.

9 All of those impacts are not strictly
10 linear because we're dealing with discrete blocks of
11 plants. So in order to get to, you know, 1,500, I
12 can't just design a windmill that's 1,500. You know,
13 there's discrete block so that it's not strictly
14 linear and we have to look at the blocks, reasonable
15 blocks of alternatives.

16 So it's not strictly linear. There is a
17 linear type relation of less and more, but we believe
18 the existing regulations and the case law is adequate
19 to require us to look at that. We believe that the
20 regulations that are being proposed will make that
21 clear of what we do, but we believe the regulations
22 are adequate right now.

23 JUDGE TRIKOUROS: I agree that that is
24 likely or could happen. You're not likely to go into
25 a COL for 86 megawatts thermal. Likely it will be one

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1 COL that goes in for one plant, let's say, for the
2 sake of argument, a 1,500 megawatt plant. You then,
3 I'm assuming, would subsequently issue another COL
4 application for the additional megawatts thermal.

5 And you may not, but that certainly could
6 be the case. We would, in fact, see if a smaller
7 plant built while another one is being litigated or
8 processed.

9 And, yes, indeed, what I want to avoid is
10 someone saying we've already covered the alternatives
11 evaluation based on the early site permit which
12 includes all the way up to 2,000 megawatts electric.
13 And I've seen this in the industry. I've seen it in
14 the design basis world and in the operations world in
15 the nuclear industry, and I'm seeing it here again
16 where one just gets a mindset that bigger is better to
17 evaluate, losing sight of the fact that sometime
18 smaller is worse.

19 And here we have a situation where smaller
20 may be worse. For example, a clean coal technology is
21 developed, but it's only good for 500 megawatts
22 electric, and it's excellent for that. You build a
23 500 megawatt nuclear plant. Now you're doing a
24 comparative analysis and you say, gee, that coal plant
25 maybe looks a lot better at 500 megawatts than the

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1 2,000 megawatt electric worth of coal.

2 So that's where I'm coming from. Now, I
3 think we should be discussing this amongst ourselves
4 as well, but in terms of where we want to go, but I
5 agree with you that especially in light of this
6 recorded session that it is likely that this will be
7 revisited at the COL stage.

8 I think the question is is there something
9 in writing that we might want just to assure that the
10 alternatives are reevaluated if the COL application
11 includes a lesser than 2,000 megawatt plant, which it
12 will.

13 MS. SUTTON: Your Honor, to be clear, as
14 Mr. Weisman indicated as well, through NEPA case law
15 and NRC regulations, in particular, looking forward to
16 51.50(c)(1), yes, the process is such that the
17 applicant has to evaluate new and significant
18 information, and this would be done so through that
19 process per Commission regulations.

20 JUDGE TRIKOUROS: It's a stretch to say
21 it's new and significant information in the sense that
22 you have to look at things a certain way. You might
23 think the average person would argue that you've
24 already covered it with your 2,000 megawatts electric,
25 and I think the fact that the analysis was done at

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1 2,000 megawatts electric indicates that to me.

2 It wasn't done looking at 500, 1,000,
3 1,500, 2,000. It was done at 2,000 with the thought
4 that 2,000 is the worst case.

5 MS. SUTTON: That's correct, and if it
6 deviates from that, then the determination would be
7 made as to whether or not that is significant.

8 JUDGE TRIKOUROS: Well, I should say as a
9 result of the record of this proceeding, I think
10 that's virtually a certainty at this point. The
11 question is --

12 MS. SUTTON: It's a certainty that it
13 would be new. It's not a certainty that for all
14 parameters it would necessarily be significant.

15 JUDGE TRIKOUROS: I don't think it would
16 be considered new in the sense that the Applicant is
17 considering that they can build anything up to 8,600
18 megawatts thermal. That's where the whole focus of
19 this entire proceeding --

20 JUDGE McDADE: But as far as --

21 JUDGE TRIKOUROS: -- and earlier in the
22 last two days.

23 JUDGE WARDWELL: But as far as the EIS is
24 concerned, did you not just testify ten minutes ago
25 that if it was anything but 2,000 megawatts electric,

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1 the process that you just described would be followed.
2 You stated that, one, it would be new if it's less or
3 more than 2,000, and then you would evaluate, and you
4 described how you would, to determine whether or not
5 it's significant, and that's consistent with NEPA; is
6 that not correct?

7 WITNESS ZINKE: That is correct for that
8 parameter in the analysis that we're talking about
9 alternatives.

10 JUDGE WARDWELL: The only question I have
11 in regards to that, you mentioned that it would be
12 documented in regards to your significance evaluation,
13 and what form does that documentation take? Would it
14 be part of the supplemental EIS for the COL? Would it
15 be a separate paper?

16 WITNESS ZINKE: Right now our
17 understanding is that the documentation of
18 significance would be documented and retained by the
19 Applicant and auditable by the NRC.

20 JUDGE WARDWELL: Not only auditable, but
21 they are the ones that have to do the new and
22 significant determination, right?

23 WITNESS ZINKE: That's right.

24 JUDGE WARDWELL: I'm really asking the
25 wrong party when you get right down to it. You just

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1 documented in your ER for that, I would assume, for
2 whatever is being proposed at the COL stage.

3 WITNESS ZINKE: Yes, we would document the
4 --- if we determined significance. Right now our
5 understanding is then in addition to it being on site
6 and auditable and reviewed by the NRC, it would
7 actually go into the submitted record.

8 JUDGE WARDWELL: But wouldn't your
9 evaluation -- for those cases where you determined
10 that it's not significant, that's what I'm interested
11 in.

12 WITNESS ZINKE: Okay.

13 JUDGE WARDWELL: How does that get
14 conveyed? You said it would be documented. How does
15 that get documented? And does that get conveyed to
16 the staff in their preparation of the EIS?

17 WITNESS ZINKE: It gets documented in the
18 Applicant's documentation, and then it's my
19 understanding once we make a submittal of a COL
20 application, the NRC is then preparing its FEIS. Then
21 similar as we did with the early site permit, the NRC
22 audits me, audits all of my documentation, comes and
23 looks at me because they have to do that as part of
24 their process in developing their FEIS.

25 JUDGE WARDWELL: So would it be submitted

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1 as part of --

2 WITNESS ZINKE: They review my
3 documentation. It's our understanding at this point
4 they would review it on site.

5 JUDGE WARDWELL: It wouldn't be submitted
6 as part of the application. It would be done as a
7 normal audit process that they are required to do in
8 order to assure that whatever information you have
9 available in your analysis associated with new and
10 significance has been reviewed by them in their
11 preparation of their EIS.

12 WITNESS ZINKE: Yes.

13 MS. SUTTON: Your Honor.

14 WITNESS ZINKE: And that the threshold for
15 submittal would be if we had determined it's
16 significant or if the NRC disagrees with us or if the
17 NRC says, "We want to see. We want this information
18 submitted."

19 JUDGE WARDWELL: Ms. Sutton.

20 MS. SUTTON: I can provided you with an
21 analogue. There have been no COL applications
22 submitted, as you're aware. However, for example, in
23 license renewal space we go through a similar
24 analysis. The application itself describes the
25 process that's used to identify new and significant

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1 information.

2 If any new and/or significant information
3 is identified, it is included in the application.
4 However, the results of the analysis that Ms. Zinke is
5 referred to is retained in information that's
6 available for NRC audit and review on site because
7 it's the empty set. There is nothing, but here's what
8 we looked at.

9 So that's how that works as an analogue in
10 renewal space.

11 JUDGE WARDWELL: So now turning to the
12 Applicant -- yeah, right --

13 (Laughter.)

14 JUDGE WARDWELL: -- turning to the staff,
15 is that copasetic with your process that you follow,
16 everything you've heard in regards to what's the
17 Applicant said and comfortable for you in regards to
18 what you need to do in order to issue an EIS to
19 address any changes from the megawatt electric that
20 may take place in the future COL applications?

21 WITNESS WILSON: Yes.

22 JUDGE WARDWELL: Thank you.

23 WITNESS WILSON: Jim Wilson for the staff,
24 yes.

25 JUDGE McDADE: And if I could, and this is

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1 a question to counsel and Ms. Sutton and Mr. Rund
2 because it's more of a legal question than a factual
3 question, and I just want to make sure that I
4 understand the analysis. At this point we're trying
5 to determine the adequacy of the alternatives analysis
6 here.

7 The alternatives analysis has presumed
8 2,000 megawatts electric; that there are other
9 possibilities as to what might actually be built; that
10 it is the position of the applicant and it is the
11 position of the staff that even though only one of
12 those alternatives have been fully run through; that
13 that is as a matter of law adequate under NEPA; that
14 there is no requirement that, for example, they
15 bracket it and do an alternatives analysis at 2,000
16 and 1,500 at 1,000; that at the single level that they
17 have done of the alternative analysis is adequate
18 under the law, that if something else is to occur,
19 that NEPA addresses that with a new and significant --
20 and that's going to be quite probably clarified in the
21 NRC range, you know, with the pending draft
22 regulation.

23 Am I correct as to what the legal position
24 is of the Applicant? Ms. Sutton is the way I just
25 said it -- do you agree with that as a matter of law?

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1 MS. SUTTON: Yes, Your Honor, that the
2 alternatives analysis that has been performed has been
3 reasonable and consistent with the law. In looking
4 forward, if there is a change to that, the new and
5 significant process and accompanying regulations and
6 guidance will address the issue.

7 JUDGE McDADE: Okay. Is that also the
8 legal position of the staff?

9 MR. RUND: Jonathan Rund for the staff.
10 The staff's position is that it was
11 reasonable to take the Applicant's goal into
12 consideration and use that as the basis for their
13 analysis.

14 JUDGE McDADE: Okay, but again, I just
15 want to make sure so that you understand at least what
16 my thinking is, and I think my colleague's thinking of
17 what we are doing, which is is the alternatives
18 analysis as currently done adequate, and we were
19 getting, you know, factually, first of all, if it were
20 linear, it would make it very easy to make that
21 determination. Factually that isn't the case because
22 it depends. It may or may not be depending on a
23 number of factual circumstances, but therefore, rather
24 than looking at it factually, we look at it legally,
25 given the regulations and whether or not those

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1 alternatives are significant.

2 If there would be a significant change as
3 NEPA defines it, then an additional at the COL stage,
4 alternatives analysis would be necessary, and that's
5 the position of the staff and the Applicant, and it's
6 also the position of the staff and the Applicant that
7 the current proposed early site permit takes that
8 adequately into consideration, and that there's no
9 other permit condition that is necessary in order to
10 capture that.

11 Ms. Sutton, is that the position of the
12 Applicant?

13 MS. SUTTON: Yes.

14 JUDGE McDADE: Mr. Rund, is that the
15 position of the staff?

16 MR. RUND: Yes.

17 JUDGE McDADE: Okay, and then we just have
18 to decide as a matter of law whether or not we agree.
19 Okay.

20 JUDGE WARDWELL: Are you happy we had a
21 legal issue to discuss finally?

22 (Laughter.)

23 JUDGE WARDWELL: I just was curious.

24 JUDGE McDADE: Yes, thrilled. But the
25 question then arises do you need any additional

1 factual clarification from the witnesses on this area.
2 We've interrupted the presentation here now for a long
3 time. You probably forgot where you were.

4 JUDGE TRIKOUROS: I do have. I would like
5 to hear the witness' professional opinion regarding
6 this issue of smaller is worse or possibly worse in
7 the sense that do you agree that since you can't show
8 linearity that, in fact, a 1,000 megawatt nuclear
9 plant, if that were the target of a COL application,
10 would require revisiting technically, a revisiting of
11 the alternatives analysis.

12 WITNESS HENDRICKSON: My opinion would be
13 yes. That would be both new and significant
14 information, and the energy analysis would have to be
15 revisited at the COL EIS.

16 JUDGE TRIKOUROS: Okay. So you're
17 reaching at the --

18 WITNESS HENDRICKSON: Oh, Hendrickson.

19 JUDGE TRIKOUROS: Sorry. You're reaching
20 a conclusion now that it's new and significant
21 information or do you feel that the new and
22 significant process would have to be implemented?

23 WITNESS HENDRICKSON: Yes, yes. The new
24 and significant process would have to be implemented,
25 but I was reacting to the 1,000 level, which is

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1 significantly different from the 2,000 level and just
2 my sort of gut level feeling is that would be
3 significant information.

4 JUDGE WARDWELL: Are you reaching that
5 conclusion that it's new and significant at this
6 point?

7 WITNESS HENDRICKSON: No.

8 JUDGE WARDWELL: Thank you.

9 WITNESS HENDRICKSON: That would not be my
10 conclusion to reach anyway. I'm not a federal
11 employee.

12 JUDGE TRIKOUROS: I think we understand.

13 JUDGE WARDWELL: You're an expert. Okay.
14 I just want to make sure it's clear in the record
15 you're not reaching that conclusion that it's new and
16 significant information at this point.

17 I think we have beat this to death. So
18 let's move on.

19 WITNESS HENDRICKSON: Continue then?

20 JUDGE McDADE: Please.

21 WITNESS HENDRICKSON: Okay. The energy
22 alternatives not involving new generation capacity,
23 the EIS considers four different options: purchasing
24 needed power from others, reactivation of retired
25 plants, extension of the operating license of existing

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1 plant, and conservation and demand side management
2 programs.

3 Initially I might note that all of these
4 options are time dependent. The availability or the
5 attractiveness of these options will depend on the
6 point in time that the Applicant would be considering
7 a new plant.

8 And in addition to that, it would depend
9 on, for example, whether the Applicant were seeking a
10 merchant plant or a regulated plant. If, for example,
11 the Applicant were seeking a merchant plant, which
12 they do, in fact, state in their application that that
13 is their primary intention, then it probably wouldn't
14 make any sense to look at purchasing needed power from
15 others because if you could do that, you wouldn't need
16 to build a merchant plant.

17 Under the purchase options, the impacts
18 would occur, but they just would occur elsewhere. On
19 the reactivation option, that's difficult particularly
20 in regard to fossil plants because of retrofit
21 requirements to meet the particular air pollution
22 requirements are very difficult on older plant.

23 Extension of operating life option, that
24 does not provide new capacity, and the conservation
25 and demand side management option, that's difficult to

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1 substitute for a base load plant.

2 The staff conclusion regarding energy
3 alternatives not involving new generating capacity was
4 that the options are not reasonable alternatives to a
5 base load nuclear plant, but that they would be
6 revisited at COL and COL if new and significant
7 information becomes available.

8 Turning now to energy alternatives
9 involving new generating capacity, the principal
10 options that are considered in the environmental
11 impact statement were new coal and natural gas power
12 generation at the Grand Gulf site. Other options that
13 were considered were oil, wind, solar, hydro,
14 geothermal, wood, solid waste, biomass, fuel cells,
15 and a representative combination of energy options.

16 As Jim mentioned in his introduction, in
17 evaluating the energy alternatives, the staff used the
18 small, moderate, large impact characterization
19 categories, which are elsewhere used in Chapter 4 and
20 5 and also for the alternative sites. These
21 definitions are set out at 10 CFR 51, Appendix B,
22 Table B-1.

23 The next slide shows the staff's impact
24 characterization for coal fired generation. This
25 covers -- the impact characterizations cover both

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1 construction and operation. The characterizations
2 assume regulatory oversight. In other words, the
3 assumption is made that appropriate permits will be
4 obtained that would limit discharges.

5 It assume four 509 megawatt electric units
6 sited at Grand Gulf, and this assumption is consistent
7 with what is stated in the ER. The error
8 characterization reflects emissions of sulfur oxide,
9 nitrogen oxide, carbon monoxide, and particulate
10 matter.

11 Waste impacts reflect impacts of ash and
12 scrubber sludge.

13 Land use ecological impacts reflect not
14 only impacts at the site, but also mining related
15 impacts and waste disposal impacts.

16 Water impacts would be comparable to
17 impacts for a nuclear power plant.

18 Socioeconomic impacts reflect beneficial
19 impacts from property tax revenue. Also there could
20 be some small to moderate adverse effects from demands
21 on housing and public services during construction.

22 Historic and cultural resource impacts
23 would be expected to be small in light of the presence
24 of Grand Gulf Unit 1 and the fact that the ESP site
25 was disturbed during the construction of Grand Gulf

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1 Unit 1.

2 Aesthetic impacts reflect that principally
3 the exhaust fact for a coal fired plant, which could
4 be up to as much as 600 feet high.

5 Environmental justice impact reflect the
6 beneficial property tax revenue impacts.

7 JUDGE WARDWELL: Before we leave this
8 slide, could you comment or someone else comment in
9 regard to this EIS alternatives evaluation both for
10 this and other issues when things, especially the
11 water use and quality, have been unresolved in regards
12 to the EIS? How can we then, how could you then
13 proceed and reach conclusions when you compare to
14 alternatives when the existing ESP proposal could not
15 reach a conclusion on a particular category, such as
16 the water use and land use for construction and
17 terrestrial ecosystems?

18 WITNESS WILSON: Jim Wilson for the staff.

19 Although the staff was unable to reach a
20 conclusion, a signal magnitude of impact for each of
21 the unresolved issues that we examined in Chapters 4
22 and 5, for the purpose of comparison with the
23 alternative sites and with the alternate energy
24 sources, there's what's called reconnaissance level
25 information that was available that was a sufficient

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1 for the staff.

2 JUDGE WARDWELL: Could you say that again?

3 WITNESS WILSON: The reconnaissance level
4 information is adequate for the staff to make the
5 comparison between the alternative sites and between
6 the altered energy considerations by staff and the
7 proposed action. We couldn't reach a single magnitude
8 of impact conclusion in Chapter 4 and 5 for operation
9 at that site, but for purposes of Chapter 8, we were
10 able to make comparisons at the same level of detail.
11 So they allowed the comparisons to go forward and have
12 some validity.

13 JUDGE WARDWELL: It still strikes me as
14 kind of a challenging effort to take any particular
15 impact that you derive from looking at an alternative
16 energy source or an alternative site and then try to
17 compare it to the proposed action at the ESP when, in
18 fact, the proposed action at ESP says we don't know
19 what it is. It's unresolved.

20 What are you comparing to when you get to
21 the proposed action of the ESP?

22 Someone else can answer. Anyone who can
23 feel comfortable answering, please do.

24 (Pause in proceedings.)

25 WITNESS WILSON: Jim Wilson for the staff.

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1 When the staff was conducting its
2 alternatives analysis in Chapter 8, it made a number
3 of what we thought were reasonable assumptions, and if
4 our assumptions turn out at the COL stage not to have
5 good finding or good founding, then we'd have to come
6 back and revisit them at the COL stage.

7 Even though we didn't know, for instance,
8 the extent of terrestrial impacts or land use because
9 the plant footprint is not precisely known; we don't
10 know where we're going to put dredge spoils; we don't
11 know how wide the transmission lines are going to be
12 if they need to be widened; nevertheless, we could
13 make reasonable assumptions they weren't sufficient to
14 give issue preclusion for the proposed action, but for
15 the purpose of comparison, we felt like we could bring
16 experience and judgment to make, comparisons that were
17 valid between the different sites and the Grand Gulf
18 site and the energy alternatives.

19 If we find at the COL stage that those
20 were bad assumptions, we'd have to revisit the issue
21 and revise the COL.

22 JUDGE WARDWELL: You prepared a table
23 listing on our request those assumptions that were
24 made for this ESP. Did you deem those to be
25 significant enough assumptions that it made it into

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1 that table?

2 I don't remember or recall off the top of
3 my head that being a fairly lengthy table.

4 WITNESS WILSON: The staff constructed
5 Appendix J of the EIS to keep track of what we called
6 key assumptions by which we meant if you change the
7 assumptions sufficient to cause our magnitude of
8 impact determination to change, that would be, you
9 know -- that was a key assumption.

10 We put those all in Appendix J and
11 tabulate them there. If some of those assumptions
12 turn out to be unfounded or no longer true, the staff
13 would, as part of its EIS at the COL stage, would have
14 to come back and revisit those issues.

15 JUDGE WARDWELL: So, for example, you made
16 assumptions in regards to water use and water quality
17 in order to do this comparison, but those assumptions
18 have made it into Appendix J, and therefore, there
19 would be a documentation of, in fact, they have
20 changed, and someone could look at that and say, "Yep,
21 it has changed," and then track whether or not the
22 staff has gone ahead and readdressed those as part of
23 the EIS for the COL.

24 WITNESS WILSON: The staff's assumptions
25 in Appendix J are for the proposed action at the Grand

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1 Gulf site. We didn't tabulate in Appendix J all of
2 the assumptions we made in conducting our alternatives
3 analysis. Those are in the various sections, are
4 spelled out in the various sections of the EIS, but
5 those assumptions on the alternatives analysis are not
6 tabulated in Appendix J. Only the ones where the
7 proposed action at the Grand Gulf site.

8 JUDGE WARDWELL: Yes, I was asking for
9 those at the Grand Gulf site that I think are more
10 crucial.

11 WITNESS WILSON: Those are in the back of
12 the document.

13 JUDGE WARDWELL: Thank you.

14 WITNESS WILSON: Thank you.

15 JUDGE WARDWELL: Having trouble getting
16 through, aren't you?

17 WITNESS HENDRICKSON: That's all right.

18 Moving now to staff impact
19 characterizations of natural gas fired generations,
20 again, this covers both disruption and operation
21 impacts. Again, the characterizations assume
22 regulatory oversight.

23 The assumption for the natural gas is four
24 combined cycle units with a net capacity of 508
25 megawatt electrics per unit, again, cited at the Grand

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1 Gulf site, and again, this is consistent with the
2 assumptions in the environmental report.

3 The combined cycle natural gas plant, the
4 gas turbine generator generates electricity in the
5 waste heat, and the gas turbine is used to make steam
6 to generate additional electricity by a steam turbine.

7 The air impacts to the natural gas plant
8 reflect emissions of sulfur oxides, nitrogen oxides,
9 carbon monoxide, and PM-10. PM-10 is particulate
10 matter with the particles with a diameter of ten
11 microns or less.

12 The only significant waste from a natural
13 gas plant would be spent SER catalysts, which is used
14 for control of NOX emissions. Water impacts would be
15 comparable to a nuclear facility. Socioeconomic
16 beneficial impacts would result from property tax
17 revenue.

18 The aesthetics impacts would be not as
19 significant as for a coal plant principally because of
20 the shorter stack height required.

21 Other generation alternatives that are
22 considered in the environment impact statement are
23 listed in the next slide with a comment or two for
24 each one of them. Oil is very expensive, and it's
25 typically not used for new base load plants because of

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1 that expense.

2 Wind has a relatively low capacity factor,
3 on the other of 25 to 35 percent. That makes that
4 unsuitable for a base load plant typically.

5 Solar, the Department of Energy conclusion
6 regarding solar for this area of Mississippi is that
7 it's suitable for water heating or photovoltaic use,
8 but not for base load power generation.

9 Hydropower, there's a relatively low
10 resource available in this area. I believe the number
11 for the State of Mississippi is on the order of 90
12 megawatts of the estimated resources available.
13 There's also high impacts, of course, with hydropower
14 due to flooding and land that's taken out for dams.

15 Geothermal, there is no suitable eastern
16 resource according to EIA, the Energy Information
17 Administration for a geothermal base load plant.

18 Wood, municipal solid waste and biomass
19 plants are typically too small. They're on the order
20 of, say, 40 megawatts, which is much smaller than the
21 size plant that's being talked about here.

22 Fuel cells at the present time are not
23 economically or technologically competitive with a
24 base load nuclear power plant.

25 Finally, the staff's conclusion regarding

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1 other generation alternatives is that the options are
2 not reasonable alternatives to a baseline nuclear
3 power plant, but they would be revisited at COL if new
4 and significant information becomes available. And
5 that's, I think, consistent with what we've talked
6 about here this morning.

7 JUDGE WARDWELL: I won't ask any
8 questions.

9 WITNESS HENDRICKSON: Staff also looked at
10 a representative combination of power sources.
11 Obviously there could be many combinations that could
12 be looked at. The combination that was looked at in
13 the Environmental impact statement consisted of three
14 508 megawatt natural gas combining cycle units, 30
15 megawatts of wind, 30 megawatts of hydro, 90 megawatts
16 from biomass solid waste, and 326 megawatts from
17 conservation.

18 The staff's characterization of impacts
19 are shown in this slide. The air impacts would result
20 not only from the natural gas plant, but from the
21 municipal solid waste or biomass plant. Waste impacts
22 from the natural gas plant, as mentioned, would
23 primarily just consist of spent SER catalysts. Solid
24 waste combustion plants would have waste residues.
25 Wind generators would have a land use and aesthetic

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1 impact, and in addition, hydro plants, as mentioned
2 would also have a land use impact.

3 This slide is a summary of the staff's
4 characterization of environmental impacts for
5 construction and operation of new nuclear, coal fired,
6 and natural gas units and a combination. Again, I
7 think we've talked about this, but again, the nuclear
8 column is for 3,000 megawatt electric and the coal and
9 natural gas in combination are based on the
10 applicant's target level of 2,000 megawatt electric.

11 In the table it can be seen that nuclear
12 compares favorably with the alternatives. So that's
13 the only point I want to make there.

14 The staff's conclusion regarding coal and
15 natural gas and the combination of generation
16 alternatives is that from an environmental
17 perspective, none of the viable energy alternatives is
18 preferable to construction of a new base load nuclear
19 power plant.

20 At this time I'll turn it over to Lance
21 Vail, who is going to talk about plant design
22 alternatives.

23 WITNESS VAIL: My name is Lance Vail, and
24 as Paul mentioned, I'm going to be discussing the
25 plant design alternatives, specifically the heat

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1 dissipation systems and circulating water system
2 options that were considered in the alternative
3 analysis.

4 This slide shows a list of the alternative
5 heat dissipation systems that were initially
6 considered by the Applicant and reviewed by the staff,
7 and I'll go through those and discuss their potential
8 preferability or lack of preferability.

9 The once through alternative was
10 considered by the staff to not potentially be feasible
11 as a result of the new EPA rule regarding the intake
12 systems. This is a rule that's in the Clean Water
13 Act, 216(b), that makes it very difficult for new
14 plants to operate as once through cooling systems.

15 The wet mechanical draft systems and the
16 wet natural draft systems, which are both considered
17 by the Applicant as proposed heat dissipation system
18 designs, were considered to be feasible at the site.

19 The wet-dry hybrid system would result in
20 less water use than the two wet designs. However, at
21 this site, given the abundance of water supply from
22 the Mississippi River, this reduction in the
23 consumptive water use was not considered to make it
24 environmentally preferable, and also, the wet-dry
25 hybrid system does result in some reduction in

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1 performance of the unit.

2 Dry towers was another option that was
3 considered. The EPA does not suggest or says that dry
4 towers do not represent best available technology at
5 this time, and they also represent a considerable
6 impact on performance.

7 The cooling ponds and spray canals were
8 evaluated by the staff in terms of the potential
9 footprint that they would represent, and the staff
10 assumed that the construction of the cooling ponds and
11 the spray canals would have to occur above the bluff
12 because of the frequent flooding in the area below the
13 bluff, and the footprint there would not be adequate
14 to support that sort of system.

15 JUDGE TRIKOUROS: Now, when you looked at
16 these, going back to my original concern earlier
17 today, did you look at them from the point of view of
18 the PPE parameters which I think we'll learn later,
19 hopefully, accommodate 86 megawatts thermal? Did you
20 look at them from that perspective?

21 WITNESS VAIL: Yes.

22 JUDGE TRIKOUROS: And I think we can all
23 agree that since this is a design issue, that if a
24 single plant is proposed in the COL, I guess I have
25 confidence in this particular case that a different

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1 method may be chosen at the COL stage based on the
2 actual COL conditions, but do you concur with that,
3 that, in fact, this is something that would be
4 revisited if less than 8,600 megawatts thermal were
5 built?

6 WITNESS VAIL: Yes. Any change to the
7 application would result in revisiting if it reached
8 that threshold that it was new information.

9 JUDGE WARDWELL: I'd like to just clarify
10 one thing. In fact, it would be revisited regardless.
11 You would start the process to evaluate whether it's
12 new and significant. Is that a better way to phrase
13 it or not?

14 And I'm sorry. I probably shouldn't
15 address that. It's not fair to say it to you. I'll
16 address that question to the Applicant.

17 Isn't it better to say that, in fact, if
18 anything changes like the was it 8,600 megawatt
19 thermal? You would initiate a process to determine
20 whether or not it's new and significant, and then the
21 same process that was so nicely described would follow
22 through depending upon the results of your analysis;
23 is that a fair --

24 WITNESS CESARE: John Cesare, Applicant.

25 Yes, sir. This is an assumption, and it

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1 would be new and would be evaluated per the process
2 we've talked about.

3 JUDGE WARDWELL: And then you would go
4 through your process in regard to EISEs and now
5 turning towards the staff; is that correct?

6 WITNESS CESARE: That's correct.

7 JUDGE TRIKOUROS: Right, and I think this
8 particular design issue, because of the way
9 engineering organizations work, would clearly be
10 looked at regardless of any issue regarding new and
11 significant. It would be looked at from an
12 engineering point of view.

13 So I think here we have kind of a dual
14 avenue of review that will reflect the exact COL
15 condition.

16 WITNESS VAIL: Since the Board mentioned
17 it this morning, I also wanted to mention that the UHS
18 system in these discussions that we were talking about
19 were focused on the normal heat sink systems, and if
20 a water based ultimate heat sink were required, the
21 staff concluded that its environmental impacts would
22 clearly be bounded by the impacts of the normal heat
23 sink, given the proposed design that the Applicant had
24 for the ultimate heat sink, which was a mechanical
25 draft tower over an engineered water supply if UHS was

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1 to be required for the design.

2 Now I just want to talk briefly about some
3 of the circulating water system design alternatives.
4 There were two alternatives that were discussed, the
5 shoreline embayment, which would require some
6 excavation to construct the shoreline embayment, and
7 a pipeline running out into the river bed. Both of
8 those options would be potential options for the
9 intake design for the plant water supply.

10 On the discharge side, the options that
11 were considered by the staff included the shoreline
12 diffuser and a submerged diffuser. The submerged
13 diffuser potentially could result in a smaller mixing
14 zone if it was properly designed as opposed to a
15 shoreline diffuser.

16 However, given the small size of the
17 mixing zone that was calculated in our analysis and
18 the fact that a submerged pipe diffuser would involve
19 constructing out into the Mississippi River, with
20 other impacts it was not clear that a submerged
21 diffuser would represent a preferable design.

22 As far as the water treatment systems, the
23 staff acknowledged that the discharges from the plants
24 would be regulated by the Mississippi Department of
25 Environmental Quality and specifically regulations 40

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1 CFR 423, which regulate the blow-down discharges,
2 which are the bulk of the discharges and, therefore,
3 the water treatment systems which were not specified
4 at this time, the staff considered to not represent a
5 definition of a system that would be environmentally
6 preferable.

7 Therefore, in conclusion, from an
8 environmental perspective, none of the plant design
9 alternatives are preferable to the proposed plant
10 design.

11 Now I'll return it to Paul Hendrickson,
12 back to the alternative discussion.

13 JUDGE McDADE: Perhaps before we do that,
14 since we're starting a new area, it's past 10:30 right
15 now, and it might be an appropriate time to take a
16 brief recess. I have down now that it's 10:35. If we
17 take a 15 minute recess and come back at 10:50, is
18 that adequate for the staff's purposes?

19 MR. RUND: Yes, it is. Thank you.

20 JUDGE McDADE: For the Applicant?

21 MS. SUTTON: Yes.

22 JUDGE McDADE: Okay. We are in recess.

23 (Whereupon, the foregoing matter went off
24 the record at 10:39 a.m. and went back
25 on the record at 10:55 a.m.)

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1 JUDGE McDADE: The hearing will come to
2 order.

3 Sir, please continue.

4 WITNESS WILSON: Paul Hendrickson of the
5 PNNL staff or if PNNL is going to be providing a
6 description of the region of interest and SERI's
7 alternative site selection process.

8 WITNESS HENDRICKSON: My name again is
9 Paul Hendrickson. The first slide I have describes
10 Entergy's steps in selecting alternative sites.

11 As an initial item, both environmental
12 standard review plan 9.3 and regulatory guide 4.2 call
13 for the use of a region of interest to initiate this
14 process.

15 JUDGE McDADE: Excuse me one second.

16 WITNESS HENDRICKSON: Yes.

17 JUDGE McDADE: Let me just note for anyone
18 who might be reading the transcript at a later point
19 in time, you're now at page 20 on Staff Exhibit 15.

20 Please continue.

21 WITNESS HENDRICKSON: Thank you.

22 Actually just for a point of
23 clarification, the reason I'm referring to Entergy
24 here instead of SERI is that the site alternative
25 analysis was done by Entergy Nuclear, which it's my

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1 understanding is a division of Entergy, and was not
2 done by SERI. It was done earlier, before SERI got
3 involved.

4 Entergy defined its region of interest as
5 the selected sites of seven of its operating nuclear
6 power plants, ANO, Grand Gulf, FitzPatrick, Indian
7 Point, Pilgrim, Riverbend, and Waterford-3.

8 The initial step in the process of
9 winnowing down this list was that the Indian Point
10 site was eliminated because of population density
11 concerns. Population density at Indian Point is in
12 excess of the 500 persons per square mile, which is
13 specified in regulatory guide 4.7.

14 I would just mention, too, that the region
15 of interest defined, the seven operating plants staff
16 found was consistent with guidance and regulatory
17 guide 4.2, which includes the definition of region of
18 interest, and I'll just briefly read what that is.

19 It's the geographic area initially
20 considered in the site selection process. This area
21 may represent the applicant's system, the power pool,
22 or area within which the applicant's planning studies
23 are based or the Regional Reliability Council or the
24 appropriate subregion or area of the Reliability
25 Council.

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1 After eliminating Indian Point, Entergy
2 conducted an initial screening. They used 11 weighted
3 criteria. The criteria were selected by Entergy. The
4 weights were selected by Entergy. Scores were
5 assigned by Entergy on a scale of one to five for each
6 of the 11 criteria.

7 This process resulted in the elimination
8 of the ANO and Waterford 3 sites, leaving four
9 remaining sites which were analyzed in more detail in
10 both the environmental report, and in the
11 environmental impact statement.

12 The final screening that was conducted by
13 Entergy using 34 weighted criteria in a similar
14 fashion -- I'll show these criteria in upcoming slides
15 -- resulted in the Grand Gulf site being selected as
16 the preferred ESP site.

17 I mentioned during the initial screening
18 process Entergy used 11 weighted criteria. This next
19 slide shows the 11 criteria that were used. The
20 source of this information is the early site permit
21 selection committee notebook that was prepared by
22 Entergy Nuclear.

23 And again, scores were assigned for each
24 of these 11 criteria using a basis of one to five, and
25 the assigned score was multiplied by the weighting

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1 factor to arrive at a total score for each site.

2 JUDGE McDADE: Did you all evaluate the
3 weighting factors, whether or not these were
4 reasonable or unreasonable?

5 WITNESS HENDRICKSON: In a subjective
6 sense, we looked at them and decided that they did
7 appear to be reasonable, yes.

8 JUDGE McDADE: Okay. When you say
9 "subjective," can you give us an idea of sort of the
10 reasoning process that you went through?

11 WITNESS HENDRICKSON: Well, we looked at
12 them and nothing struck us as being unreasonable with
13 them. They appeared to be a reasonable process.
14 Regulatory guide 4.2 does not call for specifics in
15 terms of how this screening process is conducted. So
16 we just looked at these weighting factors. Nothing
17 struck us as being unreasonable. They seemed to be
18 reasonably comprehensive, and based on that, we
19 decided that the approach was a reasonable one.

20 JUDGE McDADE: Okay, but depending on what
21 weighting factor you assign to any specific criteria,
22 you could skew the result of the analysis that one
23 facility would be better than the other, than would be
24 better than the other depending on what the factor is.

25 And, for example, you know, cooling tower

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1 drift effects of surrounding areas, you know, if you
2 determine that to be very significant -- I mean, I'm
3 just trying to get you to explain your thought process
4 on how you looked at these and how you determined that
5 what SERI did here was from a scientific standpoint,
6 was reasonable as opposed to predetermining the
7 result.

8 WITNESS HENDRICKSON: Yes, I agree with
9 you, Your Honor, that it would be possible to skew the
10 results by changing the weighting factors. The staff
11 did not try to substitute its judgment for the SERI
12 judgment or the Entergy Nuclear judgment on this. Our
13 focus was just on the reasonableness of what they were
14 doing.

15 Again, nothing in the weighting factors
16 struck us as being unreasonable and indicating an
17 attempt to skew the results.

18 JUDGE McDADE: Okay, and based on your
19 experience dealing with this, dealing with other
20 applications, it's your view that the weighting
21 factors were reasonable under the circumstances?

22 WITNESS HENDRICKSON: Yes, Your Honor.

23 JUDGE McDADE: And your subsequent
24 analysis started with that assumption and moved
25 forward?

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1 WITNESS HENDRICKSON: Yes, Your Honor.

2 JUDGE WARDWELL: Would it also be true in
3 your professional opinion that based on the number of
4 screening criteria and the relative narrow range over
5 which these weighting factors change, it would be hard
6 to predict what the outcome of any alternatives
7 analysis would be beforehand by trying to arrive at
8 some predetermined level by changing any one of these
9 drastically?

10 WITNESS HENDRICKSON: I would agree with
11 that, Your Honor, yes.

12 JUDGE WARDWELL: No, but is that what you
13 did when you --

14 WITNESS HENDRICKSON: Oh, when we --

15 JUDGE WARDWELL: Is that part of your
16 thought process?

17 WITNESS HENDRICKSON: Well, we took that
18 thought into consideration. When we looked at these,
19 we were primarily just looking -- again, I'm repeating
20 myself -- but we were looking to see whether any
21 weight factors stood out as being an unreasonable or
22 perhaps an attempt to skew the results, and we didn't
23 find any weighting factor in that category.

24 WITNESS TURNER: Your Honor, Kyle Turner
25 for the Applicant.

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1 Would it be of use to have a description
2 of how those weight factors were developed in
3 answering your question?

4 JUDGE McDADE: The answer is yes, and
5 we'll ask you that at a later point in time. Right
6 now I just wanted to find out what the staff did in
7 their analysis, what SERI did. But I think that would
8 be helpful.

9 WITNESS HENDRICKSON: Shall I go on then?

10 JUDGE McDADE: Please.

11 WITNESS HENDRICKSON: The next few slides
12 show the final screening criteria used by Entergy.
13 Again, there were two sets of screening criteria.
14 There was an initial set of criteria, 11 different
15 criteria that were on the previous slide, and then
16 there were 34 separate criteria that were used for the
17 final screening.

18 I'll just move through these. These are
19 the final screening criteria that was used in
20 selecting Grand Gulf as the preferred site.

21 The staff's conclusion regarding site
22 screening was that the Applicant's overall site
23 selection process for alternative sites was
24 reasonable, and the identification of Grand Gulf as
25 the preferred ESP site was consistent with the

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1 Applicant's approach.

2 The staff did visit each of the principal
3 alternative sites: the River Bend site, the Pilgrim
4 site, and the FitzPatrick site. We had a site visit
5 at each of these sites.

6 The next slide here shows the staff's
7 characterization of the construction impacts at the
8 three alternative sites. Most impacts were found by
9 the staff to be small. At the River Bend site, there
10 are moderate impacts shown for terrestrial ecosystem
11 impacts because it impacts upland forests. A lot of
12 them lay in hardwoods and meadows and pastures,
13 resulting from plant and transmission line
14 construction.

15 At River Bend there are also small to
16 moderate threatened and endangered species impacts
17 show because of possible impacts to federally listed
18 Louisiana black bear and state listed long-tailed
19 weasel, Southeaster shrew, eastern spotted skunk, and
20 various plant species.

21 At the Pilgrim site there are small to
22 moderate impacts shown resulting from transmission
23 line impacts in relatively high populated areas.
24 There are moderate to large impacts shown for
25 threatened and endangered species impacts on federally

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1 listed red bellied turtle and three birds, the roseate
2 tern, the piping plover, and bald eagle. I hope I
3 pronounced those correctly. Also, potential impacts
4 on various state listed species.

5 At the FitzPatrick site, there were small
6 to moderate land use impacts resulting from new
7 transmission line construction and moderate to large
8 terrestrial ecosystem impacts resulting from impacts
9 to wetlands, ponds, and forests from plant and
10 transmission line construction.

11 The next slide here, again, going back to
12 River Bend, there were beneficial social and economic
13 impacts resulting from property tax revenue on wages
14 and salaries, and small to moderate infrastructure and
15 community service impacts because of the transmission
16 line impacts.

17 At Pilgrim, there were moderate beneficial
18 to moderate adverse social and economic impacts
19 resulting from tax revenue and adverse impacts on
20 housing availability and tourism. There were moderate
21 infrastructure and community service impacts, mainly
22 due to impacts on transportation.

23 Finally, at the FitzPatrick site, there
24 were beneficial -- staff found beneficial and social
25 and economic impacts resulting from tax revenue and

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1 small to moderate infrastructure impacts mainly due to
2 impacts on the transportation system.

3 JUDGE WARDWELL: In regards to the
4 characterization at, say, for instance, Pilgrim, what
5 is the relationship of these qualitative designations
6 presented here compared to those that are or were
7 promulgated for Pilgrim's ESP? I believe Pilgrim has
8 an ESP.

9 They don't? Does one of the sites? I
10 thought one of those sites had an ESP.

11 WITNESS HENDRICKSON: Are you talking
12 about license renewal?

13 This is Paul Hendrickson.

14 JUDGE WARDWELL: Maybe it is license
15 renewal. Okay. The license renewal. None of those
16 have an ESP proposed for them? Okay. Never mind
17 then.

18 JUDGE McDADE: Let me ask at this point.
19 All of the sites that were considered as alternatives
20 are sites at which there is an existing nuclear plant.

21 WITNESS HENDRICKSON: That's correct.

22 JUDGE McDADE: Did the staff give any
23 consideration to the appropriateness of limiting the
24 alternatives to those kinds of sites as opposed to
25 also including various sites that may have other kinds

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1 of industrial operations on them now or just pristine
2 sites?

3 WITNESS HENDRICKSON: Environmental
4 standard review plan 9.3 addresses this subject
5 directly and indicates that sites that have existing
6 nuclear power plants on them are appropriate and could
7 constitute -- I don't remember the exact wording, but
8 the implication of it is that it could constitute all
9 of the alternative sites. Again, I don't remember the
10 exact wording, but essentially that's what is found in
11 ESRP 9.3.

12 JUDGE McDADE: And that was your basis for
13 determining that the site selection that they used was
14 appropriate?

15 WITNESS HENDRICKSON: Yes, sir.

16 JUDGE WARDWELL: Does NEPA require you to
17 look at all potentially feasible sites?

18 WITNESS HENDRICKSON: NEPA would just --

19 JUDGE WARDWELL: Or NRC regulations.

20 WITNESS HENDRICKSON: NEPA and the CEQ
21 regulation would say that a reasonable set of
22 alternatives need to be looked at. It's clearly not
23 feasible to look at all alternatives, and the staff
24 concluded that the seven nuclear power plant sites
25 that Entergy looked at were a reasonable set of

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1 alternatives.

2 JUDGE WARDWELL: Thank you.

3 JUDGE TRIKOUROS: Some of these, if not
4 all of them probably were licensed for more than one
5 reactor, right, initially?

6 WITNESS HENDRICKSON: Let's see. Pilgrim
7 has one reactor.

8 Somebody else?

9 WITNESS WILSON: All three of the
10 alternative sites that were offered by SERI have
11 operating plants there now and were approved for
12 additional sites, plants that were never operated.

13 JUDGE TRIKOUROS: So it was the lower
14 hanging fruit so to speak.

15 WITNESS WILSON: I'm sorry. Say again.

16 JUDGE TRIKOUROS: It was easier to license
17 something that had already been licensed for multiple
18 plants.

19 WITNESS HENDRICKSON: Okay. The next
20 slide shows staff's characterization of operational
21 impacts at the alternative sites. Again, most impacts
22 were found to be small. At the Pilgrim site, there
23 were small to moderate ecological impacts because of
24 uncertainty over salt drift from cooling towers, under
25 the presumption that a new plant at Pilgrim would use

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1 cooling towers as opposed to the existing once through
2 cooling.

3 Potential impacts on red bellied turtle
4 from transmission line right-of-way maintenance and
5 possible entrainment of winter flounder larvae.

6 The River Bend site where staff found
7 beneficial social and economic impacts resulting from
8 property tax revenue and small to moderate
9 infrastructure and community service impacts because
10 of transportation system impacts.

11 Pilgrim site, the staff found small to
12 moderate physical, social and economic impacts because
13 of the aesthetic impact of a cooling tower at the
14 Pilgrim site. Moderate beneficial to moderate adverse
15 social and economic impacts resulting from tax revenue
16 and adverse impacts on housing availability and
17 tourism. Moderate infrastructure and community
18 service impacts resulting from impacts on local
19 transportation system and housing.

20 At the FitzPatrick site the staff found
21 beneficial social and economic impacts resulting from
22 tax revenue.

23 The next slide shows the comparison of the
24 construction impacts at the proposed and the
25 alternative ESP sits. Certain issues as we've talked

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1 about at the Grand Gulf site were unresolved, but they
2 are not labeled as unresolved in the slide.

3 My testimony includes some words about the
4 resolved/unresolved issue. I believe it's at page 15
5 of my testimony, and I won't repeat that, but
6 basically the staff felt that they could, even though
7 the entry issue was unresolved, they could still make
8 a best estimate of what the issue would be that would
9 enable comparison between the proposed site and the
10 alternative sites.

11 JUDGE WARDWELL: And for completeness, is
12 it not true that the assumptions used in that
13 derivation of the bracketing that you did do are
14 presented in Appendix J and a deviation from that
15 would initiate the new and significant process?

16 WITNESS HENDRICKSON: Yes.

17 JUDGE WARDWELL: Thank you.

18 WITNESS HENDRICKSON: And this next slide
19 is just a continuation of the comparison of the
20 construction impacts at the proposed and alternative
21 ESP sites.

22 And moving on, the next slide is a
23 comparison of the operational impacts found by the
24 staff at the proposed Grand Gulf site and the
25 alternative ESP sites, and this slide corresponds to

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1 Table 9-2 of the final environmental impact statement.

2 Again, the proposed site does compare
3 favorably with the alternative sites, and also, again,
4 certain unresolved issues for the Grand Gulf site are
5 not labeled as such in the slide, but they are labeled
6 as such in Table 9-2 of the final environmental impact
7 statement.

8 The next slide is just the final
9 continuation of the staff's characterization of the
10 operational impacts at the proposed and alternative
11 ESP sites.

12 This slide shows the summary of the
13 environmental significance of nuclear power plant
14 construction and operation at the Grand Gulf ESP site,
15 at the alternative site, and for the no action
16 alternative. This corresponds to Table 10-3 in the
17 final environmental impact statement. The table
18 combines both instruction and operation impacts into
19 one table. The previous tables I was showing were
20 separated; the construction and operation were
21 separated out. In this table they are combined
22 together for the purpose of comparison.

23 Land use and water use and quality impact
24 characterizations were unresolved, but are not labeled
25 as such in the slide but are labeled in Table 10-3 in

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1 the EIS.

2 JUDGE McDADE: So just for clarification,
3 that page 35 of Staff Exhibit 15 is the same as Table
4 10-3 in the environmental impact statement. It's
5 drawn from that.

6 WITNESS HENDRICKSON: It's drawn from
7 that. They're not identical because, as I indicated,
8 the end result issues are not labeled as such in the
9 slide.

10 JUDGE McDADE: Thank you.

11 WITNESS HENDRICKSON: Finally, the staff's
12 conclusion regarding alternative sites is while there
13 are some differences in environmental impacts at the
14 proposed and alternative ESP sites, none of the
15 differences is sufficient to conclude that any of the
16 alternative sites is environmentally preferable to the
17 proposed Grand Gulf ESP site.

18 JUDGE McDADE: Is that it? Thank you.

19 Before we move on to something else, let
20 me just ask to go back to a question that was raised
21 earlier. Is anyone from the Applicant available at
22 this point to describe how those weighting factors
23 were determined?

24 WITNESS TURNER: This is Kyle Turner for
25 the Applicant, Your Honor.

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1 Yes, I am.

2 JUDGE McDADE: Would you, please?

3 WITNESS TURNER: Let me expand on what the
4 staff said in their presentation by indicating that
5 this entire process conducted by the Applicant was
6 done in accordance with the Electric Power Institute
7 siting guide, which is an interpretation of how one
8 goes about implementing the NRC NEPA regulations with
9 regard to the consideration of alternative sites.

10 So the criteria all were derived from
11 criteria provided in that guide.

12 In particular, with regard to the weight
13 factors, they were developed by a technique loosely
14 known as the modified Delphi technique. In that
15 process, a committee of multi-disciplinary experts in
16 each of the areas important to nuclear plant siting
17 was convened.

18 The criteria to be used in the evaluation
19 of sites was explained to them. They discussed them.
20 Clarifications were provided in terms of I'll call it
21 implementation level application of the criteria.

22 Based on that discussion and on the
23 knowledge of those individuals in those specific
24 areas, each individual provided a vote, if you will,
25 a ranking of each of the criteria in terms of how

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1 important they were in the overall picture in
2 selecting a site.

3 Specifically, they were asked to rate each
4 criterion from one to ten. Those votes were collected
5 and a group average was computed. That group average
6 was then made available to the team as a whole, and a
7 second round of discussion was undertaken in which
8 each of the participants provided their rationale for
9 why they ranked the criteria the way that they did.

10 Following that discussion, another round
11 of voting, another polling was taken, and those group
12 average results were computed again. That process
13 continued until the group average from one round of
14 voting until the next did not change. That's a
15 condition taken to indicate that no one is no longer
16 being convinced by any of the other participants, and
17 that the group opinion, if you will, the committee
18 opinion has stabilized.

19 And so what you see in the numbers that
20 were provided in the presentation earlier is in each
21 of two cases two sets of criteria, the final set of
22 numbers that came out of that process, the final vote,
23 if you will, of the committee.

24 JUDGE McDADE: Okay. Thank you.

25 With regard to Hearing Issue E, does the

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1 Applicant at this point in time have any testimony
2 that they feel is appropriate to clarify or to augment
3 the testimony we have heard so far from the staff?

4 MS. SUTTON: Nothing further.

5 (Pause in proceedings.)

6 JUDGE WARDWELL: Shall I go ahead with
7 some questions?

8 JUDGE McDADE: If you have them.

9 JUDGE WARDWELL: Referring to your Slide
10 No. 3 of the presentation, 10 CFR and the second
11 bullet item -- 10 CFR Part 51, Appendix A-5 calls for
12 presentation of alternatives in an NRC EIS in a
13 comparative form.

14 You then state that all reasonable
15 alternatives are to be identified. Could you
16 elaborate a little bit more on how are those all
17 reasonable alternatives identified and when do you
18 reach the conclusion and what criteria do you use to
19 say, "We've looked at all reasonable alternatives"?

20 Give us some background in regards to
21 this, and it's an open question for anyone on the
22 staff's witnesses' panel.

23 WITNESS HENDRICKSON: Well, for energy,
24 this is Paul Hendrickson again.

25 For energy alternatives, going back to my

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1 presentation, we looked at both generating and
2 nongenerating options. The generating operations we
3 found that the two principal alternatives were coal
4 and natural gas-fired generation, and then we also
5 looked at a variety of alternative energy sources,
6 oil, wind, and so forth.

7 And in coming at that list, we used our
8 own judgment. We used information sources, such as
9 the Department of Energy's Energy Information
10 Administration, and we just worked our way through it
11 and decided this was a reasonable list of
12 alternatives, and we examined each one of those in the
13 environmental impact statement. So it was a
14 combination of using staff's best judgment plus
15 alternative sources, such as EIA or experts in the
16 energy business.

17 For alternative sites, we followed the
18 procedures in terms of reasonableness. Again, we
19 followed the procedures in regulatory guide 4.2 and
20 also in ESRP 9.3. The Applicant proposed seven of its
21 existing nuclear power plant sites and using the
22 criteria and discussion in both ESRP 9.3 and
23 regulatory guide 4.2, the staff concluded that that
24 was a reasonable set of alternatives, and we were
25 satisfied with that as a starting point for

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1 examination of alternative sites.

2 Lance, would you like to add anything in
3 terms of plant design alternatives to what I was just
4 saying in terms of how you determine what was
5 reasonable?

6 WITNESS VAIL: For instance, in terms of
7 the heat dissipation systems --

8 JUDGE McDADE: Just for the record, state
9 your name.

10 WITNESS VAIL: Oh, I'm sorry. Lance Vail.

11 In terms of the heat dissipation systems,
12 I think the set that they described were pretty
13 comprehensive in terms of available technologies. In
14 terms of the circulating water systems, we did
15 consider the potential, for instance, water that could
16 have come from the groundwater system, but quickly
17 eliminated that based on the Applicant's determination
18 that those radio wells could not support that water
19 supply.

20 So the analysis, again, was reconnaissance
21 level, and we looked at their alternatives both in
22 terms of the heat dissipation systems and the
23 circulating water systems and felt like they had
24 addressed a range of design options.

25 JUDGE WARDWELL: Thank you.

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1 A follow-up question on this. To take an
2 example to help define this a little better in my own
3 mind, how far down the details of analysis do you go
4 in regards to altering some of the parameters to
5 develop these alternatives?

6 And I'll give you a for-instance because
7 that last statement I made may not make much sense to
8 anyone but me. And I'm referring now to your Figure
9 15 where you compare nuclear versus the other
10 alternative energy sources.

11 And if I understand that correctly, for
12 each one of these different energy sources, you used
13 one particular power level. How would you respond to
14 someone who said, "Well, you should have looked at as
15 part of reasonable alternatives several different
16 combinations of power levels within each of these
17 categories and developed a multi-matrix where you're
18 changing and manipulating those power levels in the
19 mix between the various alternative energy sources"?

20 And, again, this same approach could be
21 applied to other things. I'm just using this as an
22 example. So how would you respond to say that's not
23 needed by the regulation that says all reasonable
24 alternatives should be identified?

25 WITNESS HENDRICKSON: This is Paul

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1 Hendrickson speaking again.

2 In that slide, Slide No. 15, the nuclear
3 was based on 3,000 megawatt electric. The other three
4 alternatives, coal, natural gas, combination of
5 alternatives were based on the Applicant's target
6 level of 2,000 megawatt electric.

7 This repeats what we said earlier today.
8 If the Applicant were to come at the COL stage with a
9 plant level that was significantly different than
10 2,000 megawatt electric, it may very well be that the
11 analysis of energy alternatives would have to be
12 repeated. I don't make any conclusion on that, but it
13 may be the case after the new certificate analysis is
14 conducted that that would have to be repeated.

15 And you were talking about a matrix. This
16 entire analysis of energy, just of energy alternatives
17 may have to be repeated based on what level of plant
18 they decided to come in with at the COL stage.

19 Does that help? I'm not sure I answered
20 your question.

21 JUDGE WARDWELL: You didn't, but I want to
22 make sure someone else on the staff may or may not be
23 able to answer my question, and I'll elaborate more on
24 my question.

25 Okay. I'm going out of my question

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1 because staff nodded that they needed more assistance
2 in my question.

3 So 10 CFR 51, Appendix A-5, requires all
4 reasonable alternatives to be identified. I am not
5 concerned with the fact that, yes, there is a process
6 that's available if any of the assumptions or
7 selections haven't been addressed in your ESP
8 analysis, EIS analysis. I know there's a process to
9 address it if, in fact, it hasn't been at the COL
10 stage.

11 My question is: how do you respond to
12 someone who challenges this and says, "Yeah, there's
13 a process available to readdress this at the COL
14 stage, but that isn't what 51(a)(5) says."

15 Fifty-one (a)(5) says all reasonable
16 alternatives need to be identified. How do you
17 respond to that?

18 WITNESS HENDRICKSON: Well, I think in the
19 case of energy alternatives, our view is, the staff's
20 view is that we did look at all reasonable energy
21 alternatives.

22 JUDGE WARDWELL: So your position that
23 says you meet that regulation, the alternatives only
24 have to go down to the level of selecting specific
25 different types of energy sources and not varying at

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1 this point changes in the operation of those
2 particular energy sources, that you will have met the
3 regulation if, in fact, you've at least looked at
4 alternative energy sources in some fashion.

5 WITNESS HENDRICKSON: This is Paul
6 Hendrickson.

7 I believe that's correct. That would be
8 our view.

9 JUDGE WARDWELL: Thank you.

10 JUDGE McDADE: Let me just ask. I may be
11 confused, maybe not. So let me just ask a question
12 and I'll find out from the answer where I am.

13 In considering alternatives, I mean, one
14 alternative may be four 500 coal plants, one 2,000
15 coal plant, a 500 coal plant and a 1,500 natural gas
16 plant, 1,000 and 1,000.

17 I mean, do you consider those various
18 alternatives or did you just simply pack one size
19 coal, one size natural gas and the combination of
20 alternatives, just a single alternative?

21 And if you did it the other way, is there
22 any reasonable believe that it would cause a different
23 result?

24 WITNESS HENDRICKSON: I think as the
25 Applicant's -- Paul Hendrickson again -- as the

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1 Applicant point out, plants come in standard sizes.
2 So it would be unreasonable to look at a plant, I
3 think, that wasn't comparable to what our vendor was
4 providing in terms of plant sizes. So I'm assuming
5 that the 500 megawatt plants they were including in
6 their environmental report were standard plant sizes.

7 In terms of combination of alternatives,
8 clearly, we could have looked at a variety of
9 combination alternatives, and it was difficult for the
10 staff to know which combination would make the most
11 sense to look at.

12 The CEQ regulations just specify that a
13 reasonable number of alternatives need to be looked
14 at. We chose one combination of alternatives that was
15 described in my slides to look at, which included a
16 mix of natural gas, wind -- I can't remember all of
17 the ones that were in it, but several.

18 We certainly could have chosen another
19 alternative. We could have chosen, for example -- it
20 probably would not make sense to look at both coal and
21 natural gas as an alternative. That did not make
22 sense to us, to have coal and natural gas cited at the
23 same site, but in lieu of natural gas, we could have
24 looked at a coal plant, for example, with various
25 alternative energy sources.

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1 I guess basically we just felt we needed
2 to draw a line on how many things to look at, and we
3 were also using as a precedent the energy analysis
4 that was done in the license renewal environmental
5 impact statements, and in those environmental impact
6 statements, there was only one combination of
7 alternative energy sources that were looked at in the
8 many license renewal EISes that have been done, and we
9 sort of carried over from that into this ESP space by
10 looking at one combination of energy alternatives also

11 JUDGE McDADE: And don't accept this if
12 you don't agree, but I just wanted to clarify in my
13 own mind. Am I correct in this assumption that it is
14 your understanding that the alternatives analysis only
15 has to include reasonable alternatives, that in
16 choosing reasonable alternatives, you can make
17 interpretations from that as to what other
18 alternatives are out there and what the effect would
19 be, and that you from the analysis that you did draw
20 the conclusion that whatever alternatives were
21 available, that they would not have a significantly
22 less impact than the construction of the proposed
23 nuclear facility. Is that correct?

24 WITNESS HENDRICKSON: This is Paul
25 Hendrickson again.

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1 I mean, for both energy and alternatives
2 site, the staff believes that the alternatives that
3 were examined were reasonable alternatives; that
4 thought was given into that and that they would
5 satisfy the test of reasonableness.

6 I'm not sure I responded to your question.
7 It got kind of involved for me or you statement.

8 JUDGE McDADE: Well, again, just for
9 anyone who is reading this record at a later point in
10 time, you know, one of the issues people are going to
11 ask is why did they choose the alternatives that they
12 did to conduct the analysis.

13 WITNESS HENDRICKSON: Sure.

14 JUDGE McDADE: And one can normally make
15 assumptions based on analysis that has been done so to
16 how other operations would occur. And here it would
17 be, as I understand your testimony, a safe assumption
18 that the choice of alternatives was not chose in order
19 to affect the result. It was a reasonable choice of
20 alternatives to get a reasonable look at the options
21 that were available, and having taken that reasonable
22 look, the conclusions that you testified to, that
23 these other alternatives are not from an environmental
24 standpoint preferable, having significantly less
25 impact than the proposal of the building of the

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1 facilities on this early site permit.

2 WITNESS HENDRICKSON: This is Paul
3 Hendrickson.

4 Yes, I agree with you.

5 JUDGE McDADE: Okay. Have I mess that up
6 in any way?

7 WITNESS HENDRICKSON: No, I don't believe
8 so.

9 JUDGE McDADE: Okay. Thank you.

10 JUDGE WARDWELL: And in this evaluation,
11 I haven't heard anything in regards to considering in
12 this comparison of alternatives irreversible and
13 irretrievable commitment of resources, nor have I
14 heard anything in regards to the relationship between
15 short term use and long term productivity of the human
16 environment.

17 Why don't these particular categories of
18 impact which are evaluated for the ESP site itself not
19 part of the alternatives analysis or, in fact, is it
20 but it's hidden in the details?

21 WITNESS HENDRICKSON: this is Paul
22 Hendrickson.

23 My understanding of NEPA is that that
24 would only be required for the proposed action; that
25 those analyses of what you just mentioned would only

1 be required for the proposed action, and that is
2 included in Chapter 10 of the final environmental
3 impact statement.

4 JUDGE WARDWELL: As we know, NEPA is often
5 attached to many things that aren't NEPA. NEPA is a
6 pretty simplistic piece of statute. Is it fair to say
7 that there's no detail in NEPA that even discussed
8 anything remotely connected to any of the categories
9 of issues that you use in the comparison of
10 alternatives?

11 They just say -- does it not just say you
12 have to compare alternatives or some language similar
13 to that?

14 WITNESS HENDRICKSON: NEPA Section 102
15 says that the environmental impacts have to be
16 examined, that alternatives need to be examined, and
17 then the three additional items that you were just
18 talking about that are included in Chapter 10.

19 JUDGE WARDWELL: And it doesn't say in
20 NEPA that those two additional items that are
21 designated as part of NEPA wouldn't necessarily be
22 part of your alternatives analysis. It doesn't
23 prohibit anyone from doing that; is that correct?

24 WITNESS HENDRICKSON: No. This is Paul
25 Hendrickson again.

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1 No, I don't believe it does prohibit it,
2 but when those five items are listed out in Section
3 102, alternatives is one of the five, and so the
4 implication would be at least to me at least --

5 JUDGE WARDWELL: Well, let me stop you
6 right there because that's more of an issue of law.
7 So let me rephrase my question so that we're not
8 putting you in a position that we, as technical
9 people, will soon get voices raised at other tables in
10 this hearing room in regards to the statements we are
11 making.

12 You didn't feel -- is this a correct
13 interpretation? -- you did not evaluate those issues
14 from a technical basis, scientific basis in any depth
15 in the alternatives analysis based on the practice
16 that the agency has done in the review of alternative
17 analysis for NEPA, and let's just leave it at that.

18 WITNESS HENDRICKSON: This is Paul
19 Hendrickson again.

20 I believe the items we're talking about
21 are unavoidable adverse impacts, irreversible and
22 irretrievable commitments of resources and the
23 relationship between short-term uses and long-term
24 productivity of the human environment. These are all
25 covered in Chapter 10 of the EIS. They're only

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1 covered for the proposed action, and that would also
2 be consistent with the way these items were treated
3 for the license renewal environmental impact
4 statements. They were treated in a similar fashion.
5 They were only analyzed for the proposed action in all
6 of those supplemental EISes.

7 JUDGE WARDWELL: And you did not include
8 those categories in your alternatives analysis because
9 of that guidance and regulations that are used for
10 license renewal to address the EIS under NRC
11 regulations.

12 WITNESS HENDRICKSON: This is Paul
13 Hendrickson.

14 We did not include them for the
15 alternatives because it was not required by NRC
16 regulations. I don't believe it's required by CEQ
17 regulations, and I don't believe it's required by
18 NEPA.

19 JUDGE WARDWELL: Thank you.

20 I'm done.

21 WITNESS HENDRICKSON: Anything further for
22 me?

23 JUDGE McDADE: Does that Applicant have
24 anything further with regard to Hearing Issue E?

25 MS. SUTTON: Nothing further.

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1 JUDGE McDADE: Okay. Based on the
2 questioned that we have asked, does any member of the
3 staff panel believe there is anything further on this
4 issue that needs clarification?

5 WITNESS WILSON: No, sir.

6 JUDGE McDADE: Okay. Is there any reason
7 these witnesses can't be excused?

8 MR. RUND: No.

9 MS. SUTTON: No.

10 JUDGE McDADE: Okay. We are done with
11 Hearing Issue E. We can move on to Hearing Issue F.
12 Why don't we just take a brief recess in place while
13 we get the appropriate witnesses seated?

14 (Pause in proceedings.)

15 JUDGE McDADE: Is the staff ready to
16 proceed?

17 MR. RUND: Presentation on Hearing Issue
18 F will mainly be done by Charles Brandt. We also want
19 to have Steve Klamentowicz available to do a short
20 portion. He's unavailable right now, but hopefully
21 will be around after lunch or with us shortly.

22 So we'd like to begin. As far as the
23 presentation goes, Charles Brandt will be giving the
24 presentation, but if there's any questions about
25 individual impacts, we'd like to have other witnesses

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1 available. So I think it would be a good idea to go
2 ahead and swear in, in addition to Charles Brandt, Eva
3 Hickey and Van Ramsdale.

4 Their CVs have already been submitted into
5 evidence.

6 JUDGE McDADE: Okay. We are on the
7 record. The hearing has come to order.

8 Mr. Brandt, how long do you anticipate
9 that your presentation will take here?

10 MR. BRANDT: Without questions, probably
11 about 20 minutes.

12 JUDGE McDADE: Okay. Why don't we try to
13 go through your presentation before we break for
14 lunch? Hopefully then over the lunch break you will
15 be able to secure your additional witnesses. We will
16 have the other witnesses sworn at this time. They
17 will be available for any questions. If with our
18 questions we're going to go considerably more than
19 about 45 minutes, we'll probably break for lunch
20 either when you finish your presentation or at about
21 12:30, whichever comes first.

22 Does that seem like a plan?

23 MR. RUND: That's fine for the staff.

24 Thank you, Your Honor

25 JUDGE McDADE: Okay. Are all of your

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1 witnesses on this point here, Ms. Sutton?

2 MS. SUTTON: Yes, they are, Your Honor.

3 JUDGE McDADE: Okay. Would you please
4 identify? You indicated you have Charles Brandt. The
5 other two individuals, again, Mr. Rund?

6 MR. RUND: Eva Hickey and Van Ramsdale.

7 JUDGE McDADE: And the Applicant's
8 witnesses on this hearing issue?

9 MS. SUTTON: they include John Cesare,
10 David Bean and Marvin Morris, all of whom have
11 professional qualifications included in SERI Exhibit
12 1, and all of whom have been sworn with the exception
13 of Mr. Bean.

14 JUDGE McDADE: Okay. So would you please
15 rise, and Mr. Brandt?

16 (Whereupon, the witnesses were duly
17 sworn.)

18 JUDGE McDADE: Okay. Please be seated.

19 And, again, just let me reiterate when you
20 begin to speak just state your name so that we make
21 sure that we have the record attributes the correct
22 statements to the right person.

23 Sir, are you ready?

24 WITNESS WILSON: Yes, Your Honor.

25 The staff's presentation that follows is

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1 found in NRC Staff Exhibit 16. The staff's
2 presentation associated with Issue F, the
3 environmental portion is going to be made by Dr.
4 Charles Brandt of the Pacific Northwest National
5 Laboratory. He's going to address how the staff
6 considered cumulative impacts in its environmental
7 review.

8 Steve Klamentowicz, who will be joining us
9 later, is going to address how cumulative impacts are
10 addressed in the staff's radiological analysis
11 associated with the safety review.

12 Charlie.

13 JUDGE McDADE: Dr. Brandt.

14 WITNESS BRANDT: Okay. This is Charlie
15 Brandt.

16 If I could direct you to -- let's pass
17 through Slide 1 to Slide 1 of Exhibit 16. I'll talk
18 briefly about the background to cumulative impact
19 assessment that's identified and described by the CEQ
20 in 40 CFR Section 1508.7, defined as incremental
21 impact of federal action under review, plus other
22 past, present, and future federal or non-federal
23 actions.

24 The reason being that aggregated small
25 impacts from a variety of sources may have detectable

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1 or destabilizing effects on resources, as well as the
2 fact that future changes in resource condition may
3 increased the importance of small impacts from the
4 proposed action.

5 Proceeding to Slide 3, in terms of the way
6 the staff implemented the cumulative impact
7 assessment, it followed the process defined in the
8 environmental standard review plan. The issues
9 considered cumulatively included all of the issues
10 that were analyzed for site impact and site
11 suitability, including construction, operation, fuel
12 cycle, transportation, and decommissioning.

13 The only issue not analyzed in detail for
14 cumulative effects is design basis accidents. The
15 reason for that is that, first, they're extremely
16 unlikely to occur at both the Unit 1 and the proposed
17 site, and the regulatory guidance for addressing
18 design basis accidents applies to individual reactors
19 and not collections of reactors.

20 For each one of the issues, a spatial and
21 temporal context was applied that was appropriate to
22 that issue. That spatial and temporal context
23 included continued operation of the Grand Gulf Nuclear
24 Station Unit 1 and a temporal horizon that covered the
25 construction, operation, and decommissioning of the

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1 proposed new facility.

2 Going through these individually starting
3 with Slide 4, with regard to land use, the context for
4 the evaluation for land use included the counties
5 around the proposed new facility and transmission
6 system, the existence and continued operation of Grand
7 Gulf Nuclear Station Unit 1, an existing and expected
8 changes in land use for a period of 40 years.

9 The land use parameters that were
10 evaluated were land conversion for new workers and
11 related population growth and off-site land use
12 changes from new transmission systems to accommodate
13 the total new facility generating capacity.

14 Conclusions for these two parameters.
15 First, for the land conversion, small impacts were
16 identified, the growth foreseen or identified in the
17 ER and the Chapters 4 and 5 of the EIS identified that
18 growth could be easily accommodated within other
19 counties.

20 Impacts from the transmission system land
21 use conversion were not resolve. Again, this matches
22 up with the condition for Chapter 4 for the
23 construction impacts because of no information on
24 precisely where or how an expanded transmission
25 capacity would be accommodated.

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1 Proceeding to Slide 5 on air quality, the
2 context for air quality was the air quality of the
3 region, pollutant emission from the existing Unit 1,
4 and emissions from the transmission system. The
5 specific parameters included construction emissions,
6 pollutant emissions during operation, and cooling
7 tower heat, water vapor, and draft plumes from the new
8 facility.

9 Proceeding to Slide 6, the conclusions on
10 air quality issues. Small impact of construction
11 emissions because these were of limited duration and
12 occurred within an attainment area. Small impacts of
13 operational pollutant emissions, again, these were on
14 the same order of magnitude as the existing Unit 1 and
15 also occurring within an attainment area. And the
16 small impact of plumes, these are also of the same
17 order of magnitude as the existing Unit 1.

18 Proceeding to Slide 7, water use and
19 quality. The context for this analysis was the
20 existing Unit 1 operation and projected regional
21 population growth for 40 years. Parameters evaluated
22 included surface water and groundwater use, and
23 surface and groundwater quality.

24 Slide 8.

25 Conclusions for each of these issues.

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1 First, that there were small impacts from surface
2 water use addressed in a cumulative sense. Beyond
3 site streams are entirely contained within the site.
4 The Mississippi River flow is very large relative to
5 the planned use and expected use from other sources.
6 The flow is regulated and the shoreline is managed by
7 the U.S. Army Corps of Engineers.

8 Impacts on groundwater use were not
9 resolved. As you've heard earlier, the effects of
10 draw-down on the Catahoula aquifer, which is defined
11 by EPA as a sole source aquifer warranting protection,
12 has not been sufficiently characterized that we could
13 address effects on groundwater.

14 Similarly -- well, let me change that.
15 Also, impacts on service water quality were not
16 resolved because the chemical discharges from the
17 proposed new facility have not been fully quantified.
18 the chemistry from the blow-down was identified. The
19 chemistry from the other sources were not identified
20 in the Applicant's ER.

21 Finally, impacts on groundwater quality
22 were not resolved, again, because of the effects of
23 draw-down on the Catahoula aquifer and its potential
24 effect on water quality could not be addressed with
25 existing data.

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1 Slide 9, terrestrial ecosystems. The
2 context included the region surrounding Grand Gulf
3 Nuclear Station, the transmission rights-of-way, other
4 federal and state actions in the region, and Unit 1
5 operations.

6 Parameters included -- and this is broad
7 summary -- collective impacts to habitats, plants and
8 wildlife, and threatened and endangered species from
9 on-site facility construction plus off-site
10 transmission system improvements, and collective
11 impacts to habitats, plants and wildlife, threatened
12 and endangered species from transmission line
13 operation, right-of-way maintenance, and cooling tower
14 operation.

15 Slide 10.

16 Impacts on habitats and species from
17 construction were not resolved, again, primarily
18 because of the lack of information on changes to the
19 existing transmission rights-of-way that would be
20 necessary to accommodate the full 3,000 megawatt
21 electric generating capacity for the new facility.

22 Small impacts were identified on habitats
23 and species from operation within the same order of
24 magnitude as the existing Unit 1.

25 Slide 11 addresses aquatic ecosystems.

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1 Again, the context included the region surrounding the
2 Grand Gulf Nuclear station, the transmission rights of
3 way, other federal and state actions in the region,
4 and Grand Gulf Nuclear Station Unit 1 operations.

5 Parameters included collective impacts to
6 habitats, plants and wildlife, and threatened and
7 endangered species from on-site facility construction,
8 plus the off-site transmission system improvements,
9 and collective impacts to important aquatic species
10 and habitats including threatened and endangered
11 species from impingement and entrainment, and the
12 amount, temperature, and chemical composition of
13 discharged water.

14 Slide 12.

15 Conclusions. Small impacts, small
16 cumulative impacts were identified on habitats and
17 species from construction. Impacts were of small size
18 and temporary in nature, and wetland protection
19 requirements specified under Section 404, Corps of
20 Engineers wetland permit process would result in
21 wetlands being protected.

22 Small impacts were identified on habitats
23 and species from operation. First, with regard to
24 impingement and entrainment, the existing Grand Gulf
25 Nuclear Station Unit 1 does not take water directly

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1 from the Mississippi River as has been noted before.
2 So there are no cumulative effects in that area from
3 the existing operation of Unit 1.

4 The combined discharge plumes are small
5 relative to the size of the river, and the thermal
6 effects that were modeled included the thermal effects
7 from both the Unit 1 operation and the proposed new
8 facility.

9 The chemical discharges, moving on to the
10 next bullet, the chemical discharges would be
11 regulated by the Mississippi Department of
12 Environmental Quality under a NPDES permit, N-P-D-E-S
13 permit. This permit specifically addressed aquatic
14 resources in that permit limits are set to insure the
15 protection of aquatic species, and they also require
16 a cumulative analysis.

17 In addition, those permits are renewed on
18 a five-year basis, providing the state the opportunity
19 to address changes as conditions change, both in the
20 river and in the sediments and other associated
21 components of earth.

22 Slide 13, socioeconomic.

23 Context is a variably sized region that
24 includes all potential areas of work force settlement,
25 continued operation of the existing Grand Gulf Nuclear

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1 Station Unit 1, 40-year operating and decommissioning
2 horizon, and projected population growth from all
3 sources.

4 Parameters evaluated include collective
5 impacts on physical assets, defined as roads,
6 buildings, and aesthetics; collective impacts on
7 regional demography; collective impacts on regional
8 economics and taxes; and collective impacts on
9 infrastructure, transportation systems, housing,
10 recreation, public services and education.

11 Slide 14 provides the conclusions from
12 that cumulative analysis. Small impacts were
13 identified on physical systems and infrastructure
14 under the likely settlement scenario, which is workers
15 will settle where housing is available.

16 Moderate impacts would be expected if more
17 workers than anticipated settled in Claiborne and
18 Jefferson Counties, which are closest to plant.

19 Small impacts on demography were
20 identified under the likely settlement scenario.
21 Large impacts are potential if more workers than
22 expected settle in Claiborne County.

23 Third, a large beneficial impact is
24 expected on tax revenues. This is a significant
25 increase for Claiborne County. Moderate beneficial

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1 effects are identified in Warren county. And,
2 finally, moderate impacts on infrastructure and
3 community services were identified. The construction
4 and expansion of existing infrastructure could be
5 necessary to address these.

6 Proceeding to Slide 15, addressing
7 historic and cultural resources in a cumulative
8 sense, the context was variably sized region that
9 includes all of the potential areas of work force
10 settlement, existing Unit 1 and the transmission
11 rights-of-way.

12 The parameters are limited to impacts to
13 historical and cultural resource values. The
14 conclusion was that there were small impacts on this
15 resource. The applicant is committed to manage
16 discovery and protection and mitigation process during
17 the construction phase. There are no impacts
18 associated with operation.

19 Proceeding to Slide 16, environmental
20 justice, again, the context is variably sized region
21 that includes all potential areas of work force
22 settlement, existing Grand Gulf Nuclear Station Unit
23 1, 40-year operating and decommissioning horizon, and
24 projected population growth from all sources.

25 Three parameters are identified under

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1 environmental justice: unusual resource dependencies,
2 practices, or environmental pathways, including
3 preexisting health conditions.

4 Social and economic impacts in
5 infrastructure and community services.

6 Slide 17, conclusions for each of these
7 three. With regard to dependencies in health, only
8 small impacts were identified. There were no unusual
9 dependencies, practices, or vulnerabilities affecting
10 minorities or low income groups.

11 There's a large beneficial impact from tax
12 revenues realized primarily for Claiborne County, and
13 again Claiborne County is an area with a very high
14 percentage of low income and minority residents.

15 Moderate impacts were identified on
16 infrastructure and community services in these areas,
17 particularly if workers settle more heavily than
18 expected in Claiborne county, which is, again, that
19 area with a high proportion of low income and minority
20 populations.

21 Slide 18.

22 With regard to nonradiological health, the
23 context included the existing Grand Gulf Nuclear
24 Station Unit 1 operation. Parameters identified that
25 were evaluated were microbial organisms, occupational

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1 health, noise and dust emissions, and effects of
2 electromagnetic fields.

3 Conclusions regarding each of these.
4 Small impacts of microbial organisms were identified.
5 Biocides used at Unit 1 towers will continue to be
6 used, and appropriate, the Applicant is committed to
7 a use of appropriate industrial hygiene practices at
8 the proposed new facility towers.

9 With regard to occupational health, small
10 impacts were identified. The nuclear industry
11 accident rates are below national industry average.
12 Small impacts were identified. Cumulative impacts
13 from noise and dust, temporary and mitigated.
14 Finally, the impacts of electromagnetic fields,
15 chronic exposure to electromagnetic fields are not
16 resolved because of the lack of scientific and
17 regulatory consensus on this issue.

18 Slide 19, radiological impacts of normal
19 operation.

20 The context included the existing Unit 1
21 operation. Regulatory standards for protection of
22 human health and the environment, an 80 kilometer
23 radius of the Grand Gulf ESP site. Parameters
24 included dose to public and biota, occupational doses,
25 and radiological emissions.

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1 Conclusions. First, with regard to dose
2 to biota and the public, impacts identified were
3 small. The combined doses for public biota and at the
4 site boundary, which would be the maximally exposed
5 individual, were within regulatory standards or
6 guidelines.

7 Small impacts for occupational doses,
8 again, the cumulative dose was within regulatory
9 standards, and the small impacts for radiological
10 emission, the combined emissions were within limits
11 set by NRC in the State of Mississippi.

12 A good thing to add here is these
13 conclusions are small for light water reactors only.
14 They're limited to light water reactors.

15 We could look at impacts to fuel cycle.
16 From the fuel cycle -- this is on slide 20 -- the
17 context was all users of nuclear reactor fuel in the
18 United States. The parameters were fuel use by light
19 water reactors and fuel use by gas cooled reactors.

20 The conclusions were that there were small
21 impacts for light water reactors. Usage was small
22 based on existing designs and likely improvements, but
23 the impacts for gas cooled reactor designs are not
24 resolve because of the lack of information on fuel use
25 for these designs.

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1 Slide 21, fuel transportation.

2 The context was existing Grand Gulf Unit
3 1 operation and the life cycle of the new facility.
4 Parameters included radiation dose to the public from
5 unirradiated fuel, spent fuel, and radiological waste,
6 from operation of light water reactors, and the same
7 for the operation of gas cooled reactors.

8 Again, similar to the fuel cycle
9 conclusions, small impacts for light water reactors.
10 All doses and health impacts are within regulatory
11 limits, but the impacts for gas cooled reactor designs
12 are not resolved because of the lack of information on
13 fuel use for these designs.

14 Slide 22 covers decommissioning.

15 The context with the existing Grand Gulf
16 Nuclear Station Unit 1 operation. Parameters include
17 radiation dose to workers in the public, waste
18 management, water quality, air quality, ecological
19 resources, socioeconomics.

20 The conclusions provided in the EIS are
21 that the impacts from decommissioning are not resolved
22 because of a lack of information regarding
23 decommissioning for the proposed new facility.

24 And I do want to mention at this point
25 that under the regulations, information on

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1 decommissioning is not required from the Applicant at
2 the ESP stage.

3 To conclude the environmental portion,
4 most impact areas identified small impacts addressed
5 cumulatively. Socioeconomic and environmental justice
6 have the potential for large beneficial or moderate
7 adverse impacts. For these we've identified
8 mitigation that may be warranted, assistance with
9 infrastructure and public services in Claiborne
10 County.

11 Several impact areas were not resolved,
12 and this is based on information not available to
13 resolve these issues, and these would have to be
14 provided and addressed by the Applicant referencing
15 the ESP at the construction permit or combined license
16 stage.

17 Finally, I want to conclude that for
18 issues that were resolved, the EIS states that the
19 staff will verify the continued applicability of
20 assumptions at that construction permit or combined
21 license stage.

22 Now, I'd like to turn the presentation
23 over to Steve Klamentowicz, who will address safety.

24 WITNESS KLAMENTOWICZ: This is Steve
25 Klamentowicz.

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1 First off, I'd like to apologize for
2 coming in a bit late.

3 The staff evaluated in Chapter 11 of the
4 SER radiological effluent dose consequences from
5 normal operations. In this evaluation, the staff
6 relied on the environmental impact statement, all of
7 the radiological calculations and evaluations
8 contained within that document, for its safety
9 analysis, the reason for that being that all of the
10 regulatory dose requirements overlap, that is, the
11 public dose standards in 10 CFR Part 20, the EPS' 40
12 CFR Part 190, radiation protection standard, and the
13 NRC's ALARA criterion of Appendix I to Part 50. Those
14 were the same regulatory requirements used in the
15 environmental impact statement, and they carried over
16 to the safety side.

17 In our conclusion, we found that all of
18 the calculated dose impacts from the proposed ESP were
19 well within regulatory acceptance criteria.

20 That's all I have.

21 JUDGE McDADE: Thank you.

22 WITNESS BRANDT: Your Honor, if I may, we
23 have one point of clarification to make.

24 JUDGE McDADE: Please.

25 WITNESS BRANDT: If I might address this

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1 to Eva Hickey with regard to the radiological issue.

2 JUDGE McDADE: Ms. Hickey.

3 WITNESS HICKEY: I'm Eva Hickey.

4 I just wanted to clarify that for
5 radiological impacts of normal operations, there are
6 no unresolved items. In the FEIS there's a statement
7 about accidents that occurs in that same section. So
8 for radiological operations, all of the issues are
9 resolved.

10 JUDGE McDADE: Thank you.

11 (Pause in proceedings.)

12 JUDGE McDADE: Before we get into
13 questioning, does the Applicant have anything that
14 they wish to add to or comment on in the presentation
15 that we've heard so far in this hearing issue?

16 MS. SUTTON: No, Your Honor.

17 JUDGE WARDWELL: I have just a few
18 questions. In Answer 5 on page 5 of staff, it's
19 stated under SK, and I assume it's you, Mr. -- come
20 on. I'll eventually get it. I'm going to have to ask
21 you enough questions.

22 WITNESS KLAMENTOWICZ: Okay. Steve
23 Klamentowicz.

24 JUDGE WARDWELL: Klamentowicz,
25 Klamentowicz. My tongue won't let me do it.

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1 That the only potential cumulative impact
2 that was not required to be evaluated as discussed in
3 the response to Question 5 in the testimony on Hearing
4 Issue B is the potential impact from inadvertent
5 releases of radioactive liquid on the site.

6 Further down that page, Witness CB, and I
7 assume that's you, Mr. Brandt, says several lines
8 down, "The staff considered in a cumulative sense all
9 impacts that had the potential the affect the
10 environment for the duration of the proposed action
11 construction period plus 40 years of operation."

12 And then it goes on to say, "As noted in
13 the staff response to Board EIS Inquiry No. 5, the
14 only impact issue that did not receive discussion in
15 the cumulative impact section of the FEIS was design
16 basis accidents.

17 That would lead me to believe that you
18 believe that the potential for inadvertent releases of
19 radioactive liquid have been evaluated from a
20 cumulative sense, where Mr. K. says it isn't. Am I
21 misreading a discrepancy or is there a discrepancy
22 there in the testimony between you two witnesses?

23 Take your time.

24 WITNESS KLAMENTOWICZ: Steve Klamentowicz.

25 We need to have some discussion here.

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1 (Pause in proceedings.)

2 WITNESS KLAMENTOWICZ: This is Steve
3 Klamentowicz.

4 In my response, I was focusing only on the
5 inadvertent radioactive liquid releases to the plant
6 site, and the response is, no, that was not evaluated
7 for cumulative impacts. That's an accident scenario,
8 that while we do have experience recently that plants
9 are having inadvertent radioactive releases, there is
10 just no way for the staff to predict when or where
11 they will occur.

12 And as to the magnitude, our experience,
13 as called out in the lessons learned task force
14 report, every one of the events that has been
15 evaluated, the impacts have been almost insignificant
16 as far as dose potential. Fractions of a millirem,
17 and that's a hypothetical dose using our conservative
18 dose calculations contained in Regulatory Guide 1.109.

19 So my immediate answer was that that was
20 not considered because we really couldn't predict what
21 would occur. What I would add now in testimony is
22 that the result so four investigations of the events
23 that have occurred showed that there is no public
24 health and safety impact. The releases have all been
25 fractions of a millirem well within the NRC's ALARA

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1 criteria.

2 JUDGE WARDWELL: Mr. Brandt, is that
3 consistent with your general statement that, in fact,
4 if you were going to be more specific or nitpick, you
5 would have included this small modification as
6 described above in that statement or your statement
7 doesn't necessarily cover the same types of issues
8 that are --

9 WITNESS BRANDT: No, I --

10 JUDGE WARDWELL: -- phrased by him saying
11 it isn't?

12 WITNESS BRANDT: Okay. From what I
13 understand the discussion to be, I think we're
14 consistent, particularly in that for the radiological
15 releases of normal operation, the radiological impacts
16 of normal operation included the actual releases from
17 Unit 1.

18 So whether classified as routine or
19 inadvertent or whatever you will, those were the
20 actual numbers.

21 JUDGE WARDWELL: Thank you.

22 SERI testimony on page 37, where you've
23 modified the table that just talks about resolved
24 versus unresolved issues that was prepared by the
25 staff, under impact of radiological exposures, in your

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1 second bold paragraph, you make the statement that the
2 NRC staff evaluated the health impacts from routine
3 gaseous and radiologic effluent releases from the new
4 nuclear units at the Grand Gulf ESP site. Based on
5 the information provided by SERI and the NRC staff
6 independent review, there are no observable health
7 impacts.

8 And again, just for clarification, that
9 relates to strictly the anticipated effluent releases,
10 not the unanticipated effluent releases in regards to
11 being consistent with what the staff said; is that
12 correct?

13 WITNESS MORRIS: Marvin Morris for the
14 Applicant.

15 Yes, that is correct.

16 JUDGE WARDWELL: Thank you.

17 Back to the staff testimony. Question 5
18 on page 5, I hope. I'm sorry. Answer 3 on page 2
19 refers to Question 5 for Hearing Issue I, and it
20 states, if I can find it here, saying that the staff
21 presented information on its evaluation of the
22 projected cumulative impacts of routine radiological
23 discharges from potential new reactors and existing
24 station to workers, members of the public, and to the
25 environment in response to Question 5 in the testimony

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1 on Hearing Issue I.

2 In my reading of that, I didn't get any
3 sense that that was related to cumulative impacts
4 under Question 5, Hearing Issue I. What am I missing?

5 MR. CAMPBELL: Excuse me, Your Honor.
6 This is Tison Campbell for the staff.

7 The staff submitted an errata sheet with
8 a correction to that question yesterday, and it should
9 have referred to Question 3 in Hearing Issue I.

10 JUDGE WARDWELL: I knew that.

11 My last question, back to series
12 testimony, page 38, under operational impacts on
13 postulated accidents, it has been annotated that the
14 results of both the SERI and staff analyses indicated
15 that the environmental risk associated with design
16 bases accidents should be an advanced LWR, be located
17 at the Grand Gulf site would be small compared to the
18 TEDE calculations used as a safety review criteria.

19 On this bases, the consequences of DVAs at
20 the Grand Gulf site are of small significance for
21 advanced light water reactors.

22 For clarification, that statement does not
23 apply to cumulative impacts; is that correct? It's
24 merely as an impact of the light water reactors
25 themselves in regards to the accidents.

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1 WITNESS MORRIS: Marvin Morris for the
2 Applicant.

3 Yes, that would be on a per unit basis for
4 the light water reactors.

5 JUDGE WARDWELL: Thank you.

6 WITNESS RAMSDALE: Your Honor, Dan
7 Ramsdale from PNNL for the staff.

8 I would like to take exception to the use
9 of the word "risk." the staff did not calculate risk
10 for design basis accidents. We only calculated the
11 consequences.

12 JUDGE WARDWELL: And did I use that phrase
13 or did I read that phrase from testimony?

14 WITNESS RAMSDALE: I believe you read that
15 phrase.

16 JUDGE WARDWELL: From the Applicant's
17 testimony.

18 WITNESS RAMSDALE: Yes.

19 JUDGE WARDWELL: How would you respond to
20 that statement? How would the Applicant respond to
21 that statement?

22 WITNESS MORRIS: This is Marvin Morris for
23 the Applicant.

24 Mr. Ramsdale is correct. What we actually
25 calculated is the doses, the dose consequences off

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1 site for the design basis, not risk.

2 JUDGE WARDWELL: And you're comfortable
3 with that response, Mr. Ramsdale?

4 WITNESS RAMSDALE: Yes.

5 JUDGE WARDWELL: Thank you.

6 My last one. I think I said the last one
7 was the last one, but I lied.

8 JUDGE McDADE: Incorrect.

9 JUDGE WARDWELL: That's better. Thank
10 you.

11 We don't guess either. I guess I lied?
12 So I shouldn't say that.

13 JUDGE McDADE: Based on your experience
14 and education, you infer that you were incorrect in
15 your previous statement.

16 (Laughter.)

17 JUDGE WARDWELL: Moving on with that to my
18 last question, under that table that the Applicant
19 provided that was an annotation of a staff table that
20 they prepared in regards to resolved and unresolved
21 issues, under the unresolved issues, there are none
22 from the safety standpoint.

23 However, it seems to me that in the SER,
24 13.3.3, major feature H of emergency planning, the
25 staff says that this is unacceptable to them, and

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1 that's on page 1352 of the FESR.

2 MR. RUND: This is Jonathan Rund for the
3 staff.

4 We don't currently have an expert sworn to
5 address that issue. I'm assuming we're going to break
6 for lunch soon. When we come back can we please
7 address that?

8 JUDGE WARDWELL: Great. That's fine.
9 Somebody will have to cover -- even now I wasn't sure
10 where was the best time to bring that up. Because
11 this table is part of this testimony, I thought I'd
12 bring it up now. If you would have someone available
13 later at any time, it doesn't matter as long as we do
14 resolve that at some point.

15 MR. RUND: Thank you. We will do that.

16 JUDGE WARDWELL: That's all the questions
17 I have.

18 JUDGE McDADE: Okay. Let me ask something
19 here. Given Mr. Campbell's response to an earlier
20 question of Judge Wardwell, I thought Judge Wardwell
21 might be citing Rosanne Rosannadanna in his reply, and
22 with the possibility I may be doing the same here in
23 a second.

24 Am I correct, Dr. Brandt that in your
25 discussion of the radiological impacts of normal

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1 operations, you drew a distinction between light water
2 reactors and other reactors?

3 WITNESS BRANDT: No, they were both light
4 water and gas cooled were considered based on their PP
5 in the cumulative assessment.

6 JUDGE McDADE: Okay. Specifically when
7 you were discussing, I believe, Slide 19, which had
8 radiological impacts, am I incorrect that one of your
9 colleagues leaned over, whispered in your ear, and
10 then you drew back and said with regard to light water
11 reactors?

12 WITNESS BRANDT: That is the correct
13 sequence of events, yes, and then we followed up with
14 a clarification by Ms. Hickey about that issue.

15 JUDGE McDADE: Okay. So basically at this
16 point there should be no distinction drawn here
17 between --

18 WITNESS BRANDT: Normal operations.
19 that's correct.

20 JUDGE McDADE: Okay. Thank you.

21 Okay. We have some additional questions.
22 Judge Trikouros indicates that his questioning here
23 might be more than just a couple of minutes. So it
24 may be appropriate for us to break for lunch at this
25 point in time. It's about 12:30.

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1 Would a break until 1:30 be adequate for
2 the staff?

3 MR. RUND: That will be fine for the
4 staff. Thank you.

5 JUDGE McDADE: From the Applicant?

6 MS. SUTTON: Yes, that will be fine.

7 JUDGE McDADE: Okay, and given the fact
8 that people have spoken for all of the witnesses
9 without consulting them, if any witness has a problem
10 that getting back by 1:30 is going to be a significant
11 problem, do you want to address it now?

12 JUDGE WARDWELL: Do you care address it
13 now?

14 JUDGE McDADE: Okay. That being the case,
15 we will stand in recess until 1:30.

16 Thank you.

17 (Whereupon, at 12:32 p.m., the hearing in
18 the above-entitled matter was recessed for lunch, to
19 reconvene at 1:30 p.m., the same day.)

AFTERNOON SESSION

(1:36 p.m.)

1
2
3 JUDGE McDADE: The hearing will come to
4 order.

5 Judge Trikouros.

6 JUDGE TRIKOUROS: I guess we left off that
7 I had a few questions to finish up NRC Staff Exhibit
8 16.

9 For these analyses, what power levels,
10 what plant assumptions did you make?

11 WITNESS BRANDT: This is Charlie Brandt.

12 We used full PPE, which included 3,000
13 megawatt electric component, if that's what you're
14 referring to.

15 JUDGE TRIKOUROS: Right. So you used 3,000
16 megawatts electric and 87 --

17 WITNESS BRANDT: Eighty-six hundred.

18 JUDGE TRIKOUROS: -- 8,600 megawatts
19 thermal.

20 WITNESS BRANDT: Yes.

21 JUDGE TRIKOUROS: In every case.

22 WITNESS BRANDT: Yes.

23 JUDGE TRIKOUROS: Okay, and were there any
24 particular plant assumptions at all in terms of source
25 terms or anything that might be plant specific? Did

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1 you assume, for example, two ABWRs or something along
2 those lines?

3 WITNESS KLAMENTOWICZ: This is Steve
4 Klamentowicz.

5 For the normal, routine operations for the
6 radiological effluents, we used the source term as
7 provided by the Applicants to run our calculations,
8 along with what the Applicant provided as site
9 specific information.

10 JUDGE TRIKOUROS: Out of the PPE?

11 WITNESS KLAMENTOWICZ: Yes.

12 JUDGE TRIKOUROS: And those source terms
13 were based on any particular plant combination?

14 WITNESS KLAMENTOWICZ: This is Steve
15 Klamentowicz.

16 It was our understanding it was based on
17 the maximum radiological effluents, based on a
18 combination, a composite of the various reactor
19 designs being considered. So they were to take the
20 maximum for each radionuclide from a particular
21 design. So it was a composite.

22 You could ask the Applicant to provide a
23 little more information on that, but it was our
24 understanding that it was an absolute maximum based on
25 all of the reactor design being considered.

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1 JUDGE TRIKOUROS: Is that correct?

2 WITNESS MORRIS: Yes. This is Marvin
3 Morris for the Applicant.

4 What we did, we looked at the information
5 supplied by each technology vendor, and we essentially
6 on an isotopic basis, isotope by isotope, went through
7 all of the source terms provided by each technology
8 vendor and picked the highest one for each isotope.

9 So the composite doesn't reflect any
10 particular plant design or vendor. It's the worst of
11 all of them put together.

12 JUDGE TRIKOUROS: So what you're saying is
13 that you looked at the whole distribution of
14 radioisotopes for all of the plant designs and then
15 you chose the maximum radioisotopes from any of the
16 plant designs and came up with a composite source term
17 that was larger than any of the individual plants?

18 WITNESS MORRIS: Yes, for normal that's
19 the way we got the composite source term.

20 JUDGE TRIKOUROS: Now, that's as opposed
21 to taking the plant that had the largest source term
22 and using that?

23 WITNESS MORRIS: Well, the thing was when
24 we went through this and started looking at it, you
25 can't tell by the isotopic spectrum from a particular

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1 vendor if it's worse necessarily than some other
2 vendor that has a different spectrum, a different
3 distribution because each isotope has a different
4 bioaccumulation factor, conversion factor. So really
5 if you want the worst of everything, you pick the
6 highest on an isotopic basis. So that way you can't
7 get any worse.

8 JUDGE TRIKOUROS: Right. So the highest
9 Curie release on an isotopic basis.

10 WITNESS MORRIS: That's correct.

11 JUDGE TRIKOUROS: For each isotope, the
12 maximum for all the fuel design. So you might have
13 had something from the ABWR, something from the -- I
14 don't know -- the Canadian plant. What's the name?

15 WITNESS MORRIS: The ACR 700.

16 JUDGE TRIKOUROS: ACR 700.

17 WITNESS MORRIS: Yeah, that's where we got
18 the tritium number.

19 JUDGE TRIKOUROS: Et cetera. Okay, and so
20 that's how you formulated that source.

21 WITNESS MORRIS: Right.

22 JUDGE TRIKOUROS: Okay. One other
23 question. In your limited appearance sessions, we
24 heard a great deal of discussion regarding concerns
25 over where the tax revenues go and the impact on the

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1 local community which is housing the plant and the
2 fact that the money that comes from the plant in the
3 view of a number of people there, that money was going
4 primarily to outside communities, and they felt that
5 there was an injustice associated with that.

6 You mentioned in your presentation that
7 there would be assistance to Claiborne County in your
8 last slides. Could you elaborate on what you mean by
9 that?

10 WITNESS WILSON: We're going to have
11 Michael Scott from Pacific Northwest National Lab
12 answer that inquiry.

13 WITNESS SCOTT: This is Michael Scott.
14 The basis for that statement is that quite
15 frequently if there is a large adverse impact on the
16 community, higher levels of government will assist,
17 particularly if it's a matter of capital.

18 So, for example, if they needed a new
19 school and there were not funds available at the local
20 level, it's a very good bet that the State of
21 Mississippi would assist. They're not likely to leave
22 the extra students without facilities.

23 That's really what we meant by that
24 assumption.

25 Now, let me elaborate a little further,

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1 and that is that if there are adequate funds
2 available, as a result of the construction of the
3 plant, then that's probably less likely, but in that
4 case then they would have the benefit of the revenues
5 from the property values at the plant.

6 JUDGE TRIKOUROS: So in making the
7 statement, were you just assuming or had you spoken to
8 the State of Mississippi?

9 WITNESS SCOTT: I had not spoken to the
10 state.

11 JUDGE TRIKOUROS: So this was an
12 assumption on your part.

13 WITNESS SCOTT: That's correct, and it's
14 listed as such.

15 JUDGE TRIKOUROS: Not something that
16 definitely will or will not happen.

17 WITNESS SCOTT: To my knowledge, there are
18 no specific plans at this time to do anything to
19 assist the local community.

20 JUDGE TRIKOUROS: All right. Because the
21 way you presented it sounded as if there were formal
22 plans in place to provide assistance to Claiborne
23 County.

24 WITNESS SCOTT: The presentation may have
25 not been entirely clear. It is clear, I believe, in

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1 the EIS that that is an assumption.

2 JUDGE McDADE: And am I correct in my
3 recollection that even though some individuals might
4 believe that the county was not getting its fair share
5 of the tax revenues generated from the plant, that
6 nevertheless, the tax revenues generated from the
7 existing facility provide -- does the number 87
8 percent of the revenue for Claiborne County -- is that
9 a correct recollection?

10 WITNESS SCOTT: That's close, Your Honor.
11 I believe it's 83 percent. At one time, they had a
12 higher level of revenue because they were allowed to
13 tax the facility at the local level. The state chose
14 to change the law to not permit that anymore. They
15 took back the taxing to themselves and then sent some
16 money back to the county.

17 And that's a circumstance that is very
18 particular to Mississippi law, but it does include, in
19 my reading of the Mississippi tax code and the
20 regulations, it applies to any nuclear plant built in
21 the State of Mississippi by a -- I'm getting a little
22 -- I'm going to have to look at what it says here
23 because the exact wording is important.

24 Yes, the language says, "The code states
25 that any nuclear generating plant located in the state

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1 which is owned or operated by a public utility
2 rendering electric service within the state is exempt
3 from county municipal and district ad valorem taxes.
4 In lieu of payment of county municipal and district ad
5 valorem taxes, a nuclear power plant pays the state
6 tax commission a sum based on the assessed value. The
7 existing plant is taxed by the state for a sum equal
8 to two percent of the assessed value, but not less
9 than 20 million annually. At least 7.8 million goes
10 to Claiborne County. Of this amount, 3 million is
11 allocated contingent upon Claiborne County's upholding
12 its commitment to the GGNS, "Grand Gulf Nuclear
13 Station -- that's the existing plant -- "off-site
14 emergency plan. The 7.8 million represents roughly 83
15 percent of all Claiborne County revenues."

16 And then there's some discussion of what
17 they also give to Port Gibson, which is the
18 municipality.

19 "The balance of the tax revenues is
20 transferred to the county's municipalities in the
21 state where electric service is provided."

22 The important point to note in all of this
23 is the facility, whether it's a merchant plant or a
24 facility regulated by the Public Service Commission of
25 Mississippi, either way, a substantial amount of money

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1 comes back to the county.

2 At one point I didn't believe that to be
3 the case. I've since revised my opinion having reread
4 that portion of the law. It basically states any
5 nuclear plant rather than the existing nuclear plant.

6 So either it's a merchant plant and it's
7 taxable at the local level as an ordinary industrial
8 asset or it's taxed under this particular part of the
9 law, and it is subject to the same revenue sharing as
10 the existing plant. Were that to be the case, the
11 county stands to get about eight million additional in
12 funds per year from the new facility. That's my basis
13 for saying it's a large beneficial impact either way.

14 JUDGE McDADE: And that additional eight
15 million, when you take into consideration what the
16 current county expenses are represents a significant
17 amount.

18 WITNESS SCOTT: Right.

19 JUDGE McDADE: And in addition to the
20 amount of money that comes back from the state to the
21 county, in addition, there are a significant number of
22 the people who work at the facility who live in the
23 county, and they would be taxed by the county based on
24 their property within the county?

25 WITNESS SCOTT: Yes, Your Honor, that's

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1 correct.

2 JUDGE McDADE: And there also are a number
3 of businesses in the county, as well, that individuals
4 coming to and from the plant would use, and they would
5 be subject to taxation by the county?

6 WITNESS SCOTT: Yes, sir. That's also
7 correct.

8 JUDGE McDADE: Okay, and it is your
9 opinion or is it your opinion that these revenues
10 would more than make up for any additional expenses
11 that the county would have as a result of the
12 construction of this additional facility?

13 WITNESS SCOTT: That's less clear, Your
14 Honor, and the reason for my saying that's less clear
15 is that it's not -- it's not possible really to say
16 exactly where the work force is going to live and what
17 services of the county they will require. I can tell
18 you that it's a large block of money coming in. There
19 would be some increase in the level of services that
20 the county would have to provide. How large that is
21 is not clear, and so that's why we say that there's a
22 large beneficial tax impact, but there's a possibility
23 of a moderate impact on community services, moderate
24 negative impact.

25 JUDGE McDADE: Okay. thank you.

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1 Yes.

2 JUDGE TRIKOUROS: But I wanted to make
3 sure that the record was correct that there really
4 would not be any mitigation formally in place for
5 Claiborne County. Whatever it is it is, and there's
6 no formal program in place to provide them assistance,
7 not to say they won't get any assistance.

8 WITNESS SCOTT: Your Honor, there's
9 nothing that I know of at this point that is planned.
10 Governments often do not plan any earlier than they
11 have to, and so there is a possibility that at a later
12 stage that would occur, but there's nothing currently
13 that I know of.

14 JUDGE TRIKOUROS: And I think they made it
15 abundantly clear to us that in the old days, all of
16 the revenue stream would go to the county. In the
17 current situation all of the revenue stream goes to
18 the state, and then is disbursed back to the county.
19 I think that that perception is significantly
20 different for them.

21 WITNESS SCOTT: Your Honor, just in reply
22 to the last statement, there are really two
23 possibilities with the tax revenues. I want to make
24 sure you understand that. If the plant is a merchant
25 plan and the entity that operates the plant is not a

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1 public utility within the meaning of Mississippi law,
2 and if the law does not change, then there is a very
3 good possibility that that plant will be taxed as an
4 ordinary industrial asset much the same as a coal-
5 fired plant or a gas-fired plant in the state.

6 If that were to occur, then the tax yield
7 to the state or to the county would be much larger.

8 JUDGE TRIKOUROS: I understand.

9 WITNESS SCOTT: Okay.

10 JUDGE TRIKOUROS: Thank you.

11 I have no additional questions.

12 JUDGE McDADE: Okay. Does the staff have
13 any clarification with regard to the statements just
14 made? Excuse me. Does the Applicant have any
15 clarification or supplementation?

16 MS. SUTTON: Nothing further.

17 JUDGE McDADE: Is there any reason why
18 this panel can't be excused?

19 MR. RUND: There was a question -- this is
20 Jonathan Rund for the staff -- there was a question
21 about emergency planning, one of the major features,
22 and if the Board would like to ask that question now,
23 we can call Joseph Anderson to the stand, and he could
24 discuss his qualifications, and we could later submit
25 as an exhibit his qualifications.

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1 JUDGE WARDWELL: We can do that now if it
2 fits with your plans.

3 JUDGE McDADE: Okay. Let's go ahead.

4 Is Mr. Anderson here?

5 Does the Applicant have any objection to
6 this?

7 MS. SUTTON: No objection.

8 JUDGE McDADE: Okay.

9 (Whereupon, the witness was duly sworn.)

10 JUDGE McDADE: Okay. For the record,
11 would you please state your full name.

12 WITNESS ANDERSON: My name is Joseph Donald
13 Anderson.

14 JUDGE McDADE: Can you give us a very
15 brief description of your professional qualifications
16 and education?

17 WITNESS ANDERSON: Currently I am a senior
18 emergency preparedness specialist with the Nuclear
19 Regulatory Commission in the Office of Nuclear
20 Security Incident Response, Division of Preparedness
21 and Response.

22 Primary duties, at this time I am the
23 security team lead for the EP activities. I've
24 currently been with the NRC for just over three years.

25 Prior to that I have over 25 years

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1 commercial nuclear power plant experience with
2 different utilities. The majority of that involves
3 emergency preparedness, including the initial
4 development of plans, procedures, facilities,
5 equipment and training dealing with the initial
6 licensing, NASLB Board surrounding the Perry Plant.

7 I was also the emergency preparedness
8 manager at Quad City Station, and most recently work
9 in the industry was with Exelon as their Mid-Atlantic
10 Region responsible for all program coordination, and
11 that involved consolidation of the various Exelon
12 plants under a common plan, procedures, training,
13 performance monitoring programs.

14 Before that I also was six years in the
15 nuclear Navy.

16 JUDGE McDADE: Does the Applicant have any
17 objection to this witness testifying as an expert on
18 emergency preparedness?

19 MS. SUTTON: No objection, Your Honor.

20 JUDGE McDADE: Okay. You are accepted as
21 a witness.

22 What is the next exhibit, Mr. Rund, for
23 the staff?

24 MR. RUND: Staff Exhibit 52.

25 JUDGE McDADE: Okay. His curriculum vitae

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1 will be accepted as Exhibit 52.

2 (Whereupon, the document referred
3 to was marked as Staff Exhibit
4 No. 52 for identification and was
5 received in evidence.)

6 JUDGE McDADE: As soon as it is available,
7 give a copy of it to the Applicant, and if the
8 Applicant at that point has any objection they should
9 so state it, and if the objection were upheld, it can
10 be stricken.

11 WITNESS ANDERSON: Good afternoon.

12 JUDGE McDADE: Good afternoon. Hearing
13 Issue H dealt with -- I'm sorry -- Issue F included in
14 regards to the Applicant's prefiled testimony a table
15 prepared by the staff at the request of the panel that
16 summarized all resolved and unresolved issues.

17 Under the unresolved issues, there were no
18 unresolved issues on the safety side. They were all
19 unresolved issues associated with environmental. My
20 question comes to the situation that's observed when
21 reading the SER under open item 13.3.3 for dealing
22 with major feature H of the emergency planning, where
23 the staff has stated that this feature is responded to
24 by the Applicant is unacceptable..

25 I guess that isn't necessarily an open

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1 item, but it says to me that, in fact, it's a closed
2 item because it's unacceptable. Why isn't that a
3 potential fatal flaw for this ESP application?

4 WITNESS ANDERSON: For a couple of reasons.

5 Primarily, and going back, the major features plan or
6 the guidance for it is outlined in Supplement 2 to
7 NUREG 0654, primarily requires the Applicant to
8 describe their program. In this case under major
9 feature H, like it's H(1) and H(2), it has them
10 describe their on-site technical support center and
11 operations support center, and their off-site or
12 emergency off-site facility.

13 Unlike the other major features which are
14 described in Supplement 2, the specific acceptance
15 criteria have them describe these facilities in
16 accordance with a specific NUREG, NUREG 696.

17 While the Applicant did identify that,
18 yes, they would have these facilities, and that they
19 would perform these functions that was consistent with
20 the guidance that's out there, and that they would
21 staff at certain facilities, there are within the
22 guidance of 696 -- it talks specifically about
23 facility capabilities, data acquisition, habitability,
24 records, communications.

25 Therefore, initially because that

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1 information, our interpretation of Supplement 2, we
2 issued the RAI asking could they provide that level of
3 detail information at ESP.

4 The applicant's response back was that at
5 this time criteria for the TSC is evaluated and
6 approved as part of the design certification for the
7 plant that they would choose. At this time they had
8 not chosen the facility. So, therefore, that
9 information was not available as part of the ESP.

10 In regards to the Operations Support
11 Center and the emergency operations facility, they had
12 identified that at this time they had not decided
13 whether to utilize the facilities that exist for Unit
14 1 or to build separate facilities. So, therefore,
15 they had basically deferred providing the information
16 to the COL. For that reason, because we had within
17 substitute to 0654, that they specifically described
18 it according to NUREG 0696, we said it was
19 unacceptable, with the understanding that as they move
20 forward into the COL stage, they are required to
21 provide complete and integrated plans.

22 The requirements as far as evaluating
23 those complete integrated plans come from a full NUREG
24 0654, which require that they have these facilities
25 established and that they're described based on this

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1 NUREG.

2 So, therefore, first off, why we didn't
3 carry it as an open item is because these facilities
4 would be identified in detail as part of the COL
5 application. So, therefore, we thought there was no
6 reason to continue an open item because we would be
7 required to provide as part of the COL application.

8 As part of your second question, why
9 wouldn't this be a fatal flaw per se as far as an ESP
10 application, based on the EP requirements for an early
11 site permit they are required to do two things. One
12 is that they determine that there is no physical
13 impediment unique to the site that would pose a
14 significant impediment to develop emergency plans.

15 And they have done that, one, through
16 providing the major features plan, the existing off-
17 site plans, preliminary analysis, et cetera, of
18 evacuation time estimates.

19 They also are required to describe
20 contacts and arrangements with state, local, and
21 federal government agencies with responsibilities,
22 which all were done. So for that reason, we felt they
23 had met the mandatory requirement for an ESP for
24 emergency preparedness.

25 They then have the option to submit a

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1 major features plan or complete an integrated plan.
2 So, therefore, our interpretation is if one of those
3 major features wasn't met, it did not void the
4 complete EP area of the ESP application because the
5 requirement was to provide for no significant physical
6 impediment or physical characteristics that would
7 impede development emergency plans.

8 Right now, especially with having it on an
9 existing site, they do have an effective program for
10 implementing or protecting the public health and
11 safety.

12 So for those reasons, one, we didn't
13 consider it an open item because it required at COL,
14 and to be evaluated in detail, the COL, and that they
15 did meet the minimum EP requirements for an ESP, and
16 that the major features was an option. We granted
17 part of the major features, everything but H, or
18 recommended it.

19 JUDGE WARDWELL: What weight does that
20 carry in regards to your acceptance of major features
21 that were described? Of what significance is that to
22 the Applicant? Does that mean they don't readdress
23 it at the COL stage or --

24 WITNESS ANDERSON: They would be required
25 as part of the complete and integrated plans to meet

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1 the detailed requirements of NUREG 0654, which
2 basically doesn't say describe. It has you will
3 establish per the criteria of 0696. So, therefore, we
4 will at the COL stage conduct a review against 0654
5 for those elements that were not reviewed or are not
6 part of the supplement to determine whether they've
7 met that.

8 In the case of like facilities or
9 emergency action levels, there may be elements like
10 the ITAACs, the, you know -- but a method where they
11 verify that, indeed, these facilities are built to
12 meet these requirements.

13 So we felt that at the COL this would have
14 an adequate review and verification that was complete.

15 JUDGE WARDWELL: Say again why you
16 couldn't -- let me back up. As I heard your
17 testimony, under major feature H, there was no
18 criteria for acceptance, acceptability in the -- I
19 forgot whether it was a regulation or a reg. guide
20 that you quoted, but only the need to describe it.
21 Did I hear that correctly?

22 WITNESS ANDERSON: Under major feature H,
23 specifically, evaluation criteria one and two, how
24 this is worded is significantly different than most of
25 Sub 2, which is very generic, saying describe how

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1 you're going to do something.

2 In H(1) and H(2), it specifically has each
3 applicant shall describe or technical support center,
4 operation support center and also at emergency
5 operation facility in accordance with this specific
6 NUREG, NUREG 696. So where on the other major
7 features criteria we would look at that description,
8 in other words, the framework that they've established
9 for emergency preparedness program. We felt this
10 criteria was restrictive, and then it specifically
11 pointed to that criteria that was in NUREG 0696, which
12 went beyond what was contained in the major feature
13 plan, which says we'll have these facilities. This is
14 what they'll do; this is what will activate it.

15 We felt in order to properly interpret
16 what was written here in accordance with the NUREG, it
17 would have to describe things like location,
18 habitability, radiological monitoring, and data
19 acquisition. That information, based on the response
20 area, I was not available.

21 JUDGE WARDWELL: Thank you for that
22 clarification because I think I had it exactly
23 backwards. So that helped a lot, and because of that,
24 because there is that criteria for H, that's why you
25 had to deem it unacceptable.

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1 WITNESS ANDERSON: That is correct.

2 JUDGE WARDWELL: And the reason it's not
3 of greater significance in the ESP review is the fact
4 that presenting anything dealing with the major
5 features is an option that's not necessary to do at
6 the ESP stage, but the Applicant chose to do it
7 anyhow.

8 WITNESS ANDERSON: That is correct.

9 JUDGE WARDWELL: Is there anyone from the
10 Applicant here who can address some questions in this
11 area, at the current panel or in the audience?

12 WITNESS CESARE: John Cesare with the
13 Applicant, sir.

14 JUDGE WARDWELL: Is there any motivation
15 that you had in regards to offering this information
16 in regards to major features? You know, what do you
17 gain out of this by offering it now at this time?

18 WITNESS CESARE: John Cesare with the
19 Applicant. It may be important also to look at the
20 backdrop at this time period of pre-application
21 activities. In the emergency planning area, the staff
22 has NUREG guidance in detail for what one must have
23 for a complete integrated plan for a Part 50 operating
24 license and in this case for a Part 52 operating
25 license.

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1 We understood that Part 52, 5217, has the
2 thresholds exactly as the staff has described. The
3 first test must have showed no physical impediments to
4 developing emergency plans, optional major features,
5 optional complete and integrated plan, and we were
6 very pleased to have a Supplement 2 to NUREG 0654
7 which specifically was tailored to Part 52, explaining
8 major features and the planning standards under each
9 one.

10 What was not clear is exactly what the
11 staff needed in each case. So we filed an application
12 showing no significant impediments, no physical
13 impediments to developing emergency plans, showed that
14 case, and then we provided all the information we
15 thought was necessary in each major feature that we
16 thought would be sufficient to achieve that major
17 feature in the dialogue with the staff during pre-
18 application activities.

19 One aspect that came clear is that the
20 staff was unable to get a part of a major feature, and
21 so in this case, this one did not refer to general
22 descriptions, but vectored you to a very detailed
23 NUREG that you would need for a full, complete,
24 integrated plan, and with the staff unable to give us
25 except the unknown parts, which we would have to have

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1 a certified design to provide those physical
2 components, technical support center, operational
3 support center. Then, therefore, we understood that
4 that major feature could only be evaluated as
5 unacceptable, and it would be part of our COL
6 application, a complete and integrated emergency plan.

7 JUDGE WARDWELL: Does anyone else either
8 from the Applicant or the staff wish to add anything
9 more to this discussion?

10 (No response.)

11 JUDGE WARDWELL: Thank you for that input.
12 I appreciate it.

13 JUDGE McDADE: Okay. I think that takes
14 care of Hearing Issue F. We can now move on to
15 Hearing Issue G.

16 Shall we take a five-minute recess while
17 we re-sort the witness? Is that going to be enough
18 time, Mr. Rund, five minutes?

19 MR. RUND: That should be fine.

20 JUDGE McDADE: Ms. Sutton?

21 MS. SUTTON: Yes, Your Honor.

22 JUDGE McDADE: We are in recess for five
23 minutes.

24 (Whereupon, the foregoing matter went off
25 the record at 2:16 p.m. and went back on

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1 the record at 2:18 p.m.)

2 JUDGE McDADE: Okay.

3 MR. RUND: For the presentation on Hearing
4 Issue G, the staff calls George Wonder, James Wilson,
5 Brad Harvey, Steve Klamentowicz, Goutam Bagchi, and
6 Van Ramsdale.

7 Their statements of professional
8 qualifications are found in Staff Exhibit 13, and the
9 presentation slides for Hearing Issue G is found in
10 Staff Exhibit 17.

11 I ask that the witnesses please introduce
12 themselves.

13 WITNESS HARVEY: I'm Brad Harvey.

14 WITNESS KLAMENTOWICZ: Steve Klamentowicz.

15 WITNESS WONDER: George Wonder.

16 WITNESS BAGCHI: I'm Goutam Bagchi.

17 WITNESS RAMSDALE: Dan Ramsdale.

18 WITNESS WILSON: Jim Wilson.

19 MR. RUND: I believe that all of the
20 witnesses aside from Mr. Harvey have been sworn
21 already. Oh, I'm sorry. Mr. Wonder has not been sworn
22 yet either.

23 JUDGE McDADE: Okay, and before we do,
24 from the Applicants, who do you have?

25 MR. BESSETTE: Yes. On the Applicant side

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1 we have Al Schneider, John Cesare, and also we're
2 adding George Zinke to this panel. All of the
3 witnesses have been sworn in and their professional
4 qualifications entered into the record.

5 If you could introduce yourselves.

6 WITNESS SCHNEIDER: Al Schneider.

7 WITNESS ZINKE: George Zinke.

8 WITNESS CESARE: John Cesare.

9 JUDGE McDADE: all right. Would George
10 Wonder and Brad Harvey please rise?

11 (Whereupon, the witnesses were duly
12 sworn.)

13 JUDGE McDADE: Okay. You are under oath.
14 Please be seated. We're ready to proceed.

15 MR. BESSETTE: Judge McDade, maybe this
16 would be a good time to enter into the record the
17 additional exhibits supporting our presentation on
18 Issue G. We are entering new Exhibits 32 and 33.
19 They have been provided to the staff both
20 electronically and in hard copies. We're providing
21 them to Ms. Wolf.

22 Also as part of that disk, we are
23 including a full copy of SERI Exhibit 8, which is the
24 engineering report we discussed this morning and an
25 additional electronic copy of SERI Exhibit 31, which

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1 we entered yesterday.

2 So you should have full electronic copies
3 of all of our exhibits.

4 JUDGE McDADE: Okay. Can you give like a
5 three or four-word description of Exhibit 32 and
6 Exhibit 33?

7 MR. BESSETTE: Exhibit 32 is a brief
8 introductory slide that Mr. George Zinke will be
9 presenting at the opening of Issue G, and Exhibit 33
10 are some closing slides that will be used by Mr. John
11 Cesare on Issue G.

12 JUDGE McDADE: Thank you.

13 You have no objection to our receiving
14 those?

15 MR. RUND: Staff has no objection.

16 JUDGE McDADE: Okay. SERI Exhibits 32 and
17 33 are received, and I believe that I had already
18 indicated that SERI 8, ER-02, has been received, and
19 it was just going to be supplied at a later point in
20 time.

21 MR. BESSETTE: That's right, and that's
22 what's on that disk.

23 (Whereupon, the documents
24 referred to were marked as Staff
25 Exhibit Nos. 32 and 33 for

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1 identification and were received
2 in evidence.)

3 JUDGE McDADE: Thank you.

4 Who is going to start for the staff?

5 MR. RUND: Actually for this presentation,
6 we want to start with the Applicant so they can -- I
7 think we had planned to do that -- so that they can
8 describe the formulation of the PPE, which will then
9 give some context to how the staff evaluated it, if
10 that's okay with the Board.

11 JUDGE McDADE: That sounds very
12 reasonable. It's agreeable to the Applicant, I
13 assume?

14 MS. SUTTON: It is, Your Honor. We have
15 prepared the first part of the presentation that will
16 be presented by Mr. Cesare.

17 JUDGE McDADE: Please proceed.

18 MS. SUTTON: I'm sorry. Mr. Zinke is
19 first providing a few introductory remarks.

20 JUDGE McDADE: Okay. Because I was
21 thinking given the description of what the Exhibit 32
22 was, I was expecting Mr. Zinke to start. I figured
23 Mr. Cesare just didn't need any audiovisual assistance
24 and he was going to soldier on, but, Mr. Zinke, please
25 continue.

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1 WITNESS ZINKE: George Zinke with the
2 Applicant.

3 SERI Exhibit 32 is what I will speak from.
4 The intent is to give an overview and a context to
5 help better understand where the PPE fit in, why we
6 developed them in a certain way, and the role that
7 they continue to play throughout the licensing
8 process.

9 This slide also deals with the subjects
10 that have come up on every issue so far in the issues
11 left. The ESP licensing has a number of components
12 that all play a role both at the beginning and
13 throughout. The next step that once an ESP is issued,
14 it is used in a COL application that's different than
15 like an operating license where the next step is
16 construction and operation. This one feeds into
17 another process.

18 So it's important to know how it fits in
19 with that and what pieces go where. The major
20 components of the ESP licensing is the application,
21 which are five parts; the FSER, which is a staff
22 document; the FEIS, the staff document; and the
23 permit, which the NRC staff entered this morning as a
24 draft template, NRC Staff Exhibit 50.

25 In the ESP application, the five major

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1 parts, administrative information, site safety
2 analysis, environmental report, emergency planning
3 information and programs and plans, which for our
4 application, since we did not have an LWA, there was
5 no redress planned. That was the part, the section of
6 the application that would have gone into.

7 So programs and plans is limited to the
8 quality assurance program description that was used in
9 preparing the application.

10 Part 1 of the administrative information
11 as carrying forward basically loses its purpose. The
12 COL application would have a similar section in
13 describing the purpose of a COL application. So the
14 information basically doesn't serve purpose going
15 forward.

16 The site safety analysis report by
17 regulation in the next step gets incorporated word for
18 word into the COL application. That means every word,
19 every commitment, every statement of fact, everything
20 gets into the COL application because it gets
21 incorporated into the SAR that gets put into the COL
22 application.

23 What that means is that at the time of the
24 COL application I have to address everything that was
25 in the SAR portion of the ESP. By address, I mean

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1 that it all has to be true. Any commitment in there
2 gets carried forward. If I need to correct something,
3 I have to go through the variance process at that
4 point, if I need to add things, but I start with the
5 baseline of every word that's in the early site
6 permit.

7 JUDGE WARDWELL: Do you add paragraphs
8 inserted into the ESP SAR or do you leave that as an
9 entity, say, an appendix or something, and then refer
10 to it in the main body, or what shape does this take
11 when you would pick up an SAR from the COL that's
12 using ESP as their basis?

13 WITNESS ZINKE: The Part 52 requires me
14 to, for the COL, submit a complete SAR. So the
15 formatting of that is beyond the regulation. So
16 there's been a number of formatting options that the
17 industry is going through and working towards.

18 The format option we're dealing with right
19 now is that, in general, the entire SAR would be
20 physically in the application, and then we would have
21 -- which this is all electronic files, and then we
22 would have some options based upon how much actually
23 has to change or not change as to whether you insert
24 paragraphs or you just copy the entire text or you
25 just have a one line saying we incorporate by

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1 reference this entire thing.

2 JUDGE WARDWELL: Does the regulation
3 require you in the COL SAR to provide some mechanism
4 to discriminate between words that were initially
5 prepared for the ESP from those that are being
6 prepared for the COL SAR so that one can see either by
7 referencing it or if the actual words are folded right
8 into the hard copy also of the SAR from the COL,
9 whether one would be able to tell whether or not it
10 was originally written for the ESP or whether it's new
11 stuff written for the COL?

12 WITNESS ZINKE: The current regulations
13 don't require that. We've recognized that it would be
14 extremely difficult for the staff to review it if we
15 didn't distinguish between what was part of the ESP,
16 what's being added, what goes with completion of the
17 action items to distinguish those things. It would
18 make it much easier for the staff to review.

19 JUDGE WARDWELL: Thank you.

20 WITNESS ZINKE: So that is what we are
21 going to do.

22 The SAR, site safety analysis report at
23 COL obviously has a lot more information than just
24 what was in the ESP. So one of the things, we have to
25 complete the action items that came with the ESP.

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1 Likewise there's things added from a design CERT. We
2 have by regulation basically a completion standard
3 that we have to meet of we have to make sure that in
4 COL it has everything else that the ESP didn't have.

5 The environmental report is a little bit
6 different. On the environmental report, what gets
7 submitted at COL, we will submit a supplement to the
8 environmental report. So that means we, again, start
9 from what was the environmental report that we
10 submitted in the early site permit, but we have a
11 number of processes by regulation that I have to work
12 through in order to get the additional information
13 that goes in.

14 I have to by regulation deal with the
15 comparison regulation, where I have to state what
16 parameters fall within the parameters, and if they
17 don't, then I have to justify that. So there's a
18 section in the application that deals with that
19 comparison.

20 I have to address new and significant
21 information, which we talked about that process this
22 morning, that that has the potential for driving new
23 information that has to go into the COL application.

24 I have to deal with the unresolved items,
25 which are documented then in the FEIS, and I have to

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1 add anything that was deferred, meaning that in the
2 completeness standard of the regulations if there was
3 something the regulation required at COL that it
4 didn't require at the ESP, for example, cost-benefit
5 analysis, then that automatically gets added also.

6 So what that ultimately means is that for
7 the environmental report, I have to take the
8 environmental report; I have to take the FEIS and go
9 through those processes in order to create the
10 supplement that by regulation would go with the COL
11 application.

12 The emergency planning information is also
13 different. What I'm required to do at COL is submit
14 a complete and integrated emergency plan. The major
15 features and the establishment at ESP of no major
16 impediments don't fit into that end product of an
17 emergency plan, and so we use those in developing the
18 emergency plan, but it's not the incorporation of word
19 for word. It's that as I write up for a given section
20 of the emergency plan, I would go back to my E-plan
21 that was in the ESP application and the FSER where the
22 staff wrote about a particular major feature, and I
23 need to keep consistency with those as I prepare so
24 that if there's something inconsistent, then I can
25 identify that and include that in the application.

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1 But because the emergency plan is a
2 document for which there is an NRC standard of all the
3 information that has to go in there, it won't look
4 like the information that was submitted in the format
5 of the early site permit, but there is a relationship.

6 JUDGE WARDWELL: To be sure I understand
7 that then, if you had chosen not to submit any of the
8 major features as part of the ESP, then at the COL
9 stage, a person would not necessarily see those titles
10 in your emergency plan. The idea and the components
11 of it would be there, but it wouldn't necessarily be
12 designated as major feature H, for example.

13 WITNESS ZINKE: Well, in fact, as we
14 prepare the emergency plan, it probably won't use the
15 word "major feature" at all such that the end product,
16 whether I had gotten major features approved or not
17 approved or never submitted, the end product of the
18 COL is the same product.

19 The fact that I had a major feature
20 approved will play a role in the hearing process, but
21 it doesn't play the same kind of role in the document
22 that I prepared that goes in the application.

23 JUDGE TRIKOUROS: Does the emergency plan
24 -- and I can understand that it would be a totally
25 different document. It makes sense. It would not

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1 include, I assume, emergency plan implementing
2 procedures or anything like that. That would be
3 something that would be developed later.

4 --WITNESS ZINKE: The COL application, yes,
5 the procedures don't go with the plan. Now, my memory
6 right now is that there's some ITAAC involved with the
7 emergency plan, which there's a large number of ITAAC
8 associated with the E-plan, and one of those or
9 several of those deal with the actual procedures.

10 So there is something about the
11 procedures, but the actual procedure comes later.

12 JUDGE TRIKOUROS: So the ITAACs are a
13 placemat, so to speak, for the procedures. Your
14 commitment to six months prior to loading fuel, have
15 the emergency plan implementing procedures in place,
16 reviewed and approved by the staff.

17 WITNESS ZINKE: Yes, and there's ITAAC
18 that covers a lot of things other than just the
19 procedures, but I believe that's --

20 JUDGE TRIKOUROS: I understand.

21 WITNESS ZINKE: Yeah, exercise, lots of
22 things.

23 JUDGE TRIKOUROS: Right.

24 WITNESS ZINKE: And then the programs and
25 plans portion of the ESP application is, again, one of

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1 those things that pretty much goes away in that it
2 doesn't carry forward into the COL application. In
3 the COL application will be a section that describes
4 the QA program that was used to develop the COL, and
5 then there will be a QA program that goes forward into
6 construction and operation.

7 So it doesn't have the same relevance in
8 the going forward application. It still has relevance
9 in a licensing sense that it established the pedigree
10 of the information that's going forward.

11 Then the other pieces of the ESP
12 licensing, the FSER, as I said, is used in our
13 development of the SAR and the E-plan. The FEIS has
14 a different licensing status because it is
15 particularly caught up by Part 51. So it carries
16 forward with its own regulatory weight forever, and
17 the NRC will go through various review processes under
18 Part 51. So it carries forward just in the same
19 manner I have to also carry forward the environmental
20 report, but it has a different regulatory status than
21 like the FSER.

22 And then the last key piece, which was
23 entered as a draft in Exhibit 50 this morning, is the
24 permit itself, which the permit may have some things
25 in it, special conditions that don't appear anywhere

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1 else, in which case the COL application, in addition
2 to all of those things I've already talked about,
3 would have to address.

4 We also know from the draft that the
5 permit will contain certain things like the COL action
6 items and some lists out of these documents that I
7 would have had to address anyway, but them being in
8 the permit, you know, certain is acceptable and in a
9 lot of cases desirable. But I would have had to
10 address them anyway because of the regulations.

11 So that pretty much gives a real basic
12 framework. What we planned on next was Mr. Cesare is
13 going to go through the PPE, which has values that are
14 contained in the SAR and the environmental report that
15 you will better understand then how we developed them.
16 The staff will talk about how they're used, and now
17 you know how they essentially then carry forward into
18 the process.

19 JUDGE TRIKOUROS: And just as a
20 preliminary, my understanding is that the PPE, since
21 you don't have a plant identified, that the PPE is the
22 surrogate for that plant, for a plant.

23 WITNESS ZINKE: That's correct.

24 JUDGE TRIKOUROS: Therefore, when you
25 finally do have a plant that likely will have a DCD

1 associated with it, that comparison of the plant
2 design features will be made against the PPE in terms
3 of identifying what new analyses need to be done and
4 which analyses have been done with acceptable
5 assumptions; is that correct?

6 WITNESS ZINKE: That's correct, and that
7 comparison goes in a particular location in the COL
8 application. There's a comparison done for the site
9 safety analysis and a comparison done for the E-plan.
10 I'm sorry. Not the E-plan; the environmental report,
11 and so those comparisons are done in addition to for
12 the SAR the fact that I have to address every word
13 even if it wasn't labeled somewhere as a PPE.

14 JUDGE TRIKOUROS: Understood, and in part
15 what we're discussing here today is management
16 oriented in the sense of this is a big thing to
17 manage, a lot of pieces to this. The Board is looking
18 at it from the point of view of ease of management in
19 all of these interfaces because we have a DCD
20 interface, too, that's not even being discussed in
21 this proceeding, and we have ITAACs which are not
22 being discussed at this proceeding. So this is a
23 complex thing.

24 And we are concerned about the management
25 of this entity, and that's part of where we're coming

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1 from.

2 WITNESS ZINKE: George Zinke again.

3 I think not at this point, but we would be
4 prepared to talk about the processes used to manage
5 all of those things together as we go through in the
6 licensing process.

7 JUDGE TRIKOUROS: No, but we are here at
8 this point discussing what purpose the PPE plays in
9 that.

10 WITNESS ZINKE: Yes, yes.

11 JUDGE WARDWELL: Based on your anticipated
12 submittals, if the PPE is not included as part of the
13 ESP permit, it still will be carried forward, as I
14 understand your testimony because it is part of the
15 SAR.

16 WITNESS ZINKE: Yes. It's carried forward
17 in the pieces of it that are associated with SAR,
18 carried forward with the SAR. The values that are
19 with the environmental report get carried forward
20 likewise in that context.

21 JUDGE WARDWELL: Well, that was going to
22 be my next question. How is that because I thought
23 you were only submitting a supplement to the ER and
24 not repeating the entire ER.

25 WITNESS ZINKE: It gets carried forward

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1 because I'm required by law to do the comparison with
2 the values.

3 JUDGE WARDWELL: Thank you.

4 WITNESS ZINKE: And it also gets carried
5 forward in a different sense, that we have to think we
6 go through each one in the new and significant. So I
7 have several comparisons that I have to do with those
8 parameters.

9 JUDGE TRIKOUROS: And just one other
10 general point before we get into the details. When
11 we're doing our review and we see NEI documents that
12 paint a picture of what a PPE looks like and we look
13 at perhaps other ESPs, which have a PPE and we look at
14 your PPE, with the clear understanding that this PPE
15 is a big thing in terms of these comparisons that have
16 to be done and all three are different, and when I say
17 "different," I mean different in terms of the
18 completeness of the information.

19 And, in fact, maybe I could say that one
20 of the other ESPs and NEI document is the same, but
21 your PPE is different. So we'd like to understand
22 that in that context.

23 WITNESS ZINKE: And that's what Mr. Cesare
24 is going to discuss now.

25 WITNESS CESARE: John Cesare with the

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1 Applicant.

2 I'm speaking from SERI Exhibit 19.

3 Slide 2.

4 I thought I would repeat the Hearing Issue
5 G, evaluation of plant parameter envelope. The
6 overview asks about the relationship between the
7 applications PPE listing and the NEI guidance.
8 Specifically, what is the relationship between those
9 parameters and the megawatt thermal, megawatt electric
10 is not clear to the Board.

11 Specific questions: compare the NEI
12 guidance with the PPE table, which is Staff Exhibit 1,
13 and specifically NEI guidance provides a listing, and
14 identify which ones are not in the PPE tables, which
15 gets to one of the key questions that you're asking.

16 Question 2, how do the PPE parameters in
17 the staff's analysis support maximum power given in
18 the application?

19 Discuss the treatment of the PPE in the
20 FSER and the FEIS.

21 And lastly, discuss the completeness of
22 the PPE listing, that is, the acceptability of that
23 listing as a subset of the NEI guidance.

24 JUDGE TRIKOUROS: Let me just add another
25 one just because of the conversation about the

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1 application or the permit.

2 What is the relationship between the 4,300
3 megawatts thermal and the 8,600 megawatts thermal,
4 besides being a factor of two?

5 WITNESS CESARE: And linear.

6 (Laughter.)

7 JUDGE WARDWELL: Concerns two, of course.

8 WITNESS CESARE: We will get to that.

9 So the agenda has changed a bit because we
10 decided, based on the Board's initial remarks
11 yesterday, we would offer the prefacing remarks that
12 Mr. Zinke just offered, but we did cooperate with the
13 staff in the presentation on this issue.

14 SERI by this presentation is going to
15 provide an overview of the PPE development process,
16 going from the NEI guidance to the form of the
17 application as the PPE tables are presented in that
18 application.

19 Then we will be followed by the staff
20 presentation that we have reviewed, offers basically
21 their review of the PPE, their use of it, the analyses
22 of the PPE as it's presented in the SER, and the EIS,
23 and then we would support further questions.

24 Vocabulary-wise, I'm going to try to refer
25 to the FSER in that manner and the FEIS. When I refer

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1 to the SAR, I'm talking about the application, the
2 site safety analysis report. The ER is the
3 application's environmental report.

4 Slide 4.

5 Topics in this presentation. First thing,
6 continuing on the Part 52 discussion of the key parts
7 of the ESP, we thought it would be helpful to carry
8 that forward with some terminology that, I think, is
9 key to why in the end is the listing different from
10 NEI guidance to the PPE tables, and how does the PPE
11 concept fit in the surrogate plan?

12 Secondly, I propose a chart that gives an
13 overall view of the flow from NEI guidance of the PPE
14 tables as it appears in the application, and then we
15 get into details.

16 The creation of the work sheet, which is
17 an intermediate administrative tool that we use to
18 develop the PPE and its refinement, and lastly, how do
19 you end up with the tables that we present in the
20 application.

21 So the overall goal is how did we, SERI,
22 end up with the application and the PPE listing that
23 we have for application, and a couple of points.

24 One is why did we split them and why did
25 we go safety and one listing in the safety analysis,

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1 one listing in the ER, and how were they reduced and
2 the parameters that are not there.

3 Slide 5.

4 Terminology. These are four definitions
5 that appear in our application in SAR 1311, which is
6 Exhibit 6. I have grouped them because in the
7 application for Grand Gulf with an ESP, they would be
8 grouped in the way I've shown them boxed. However,
9 there are various permutations. You can go directly
10 to COL with no ESP. You don't have to have a
11 certified design. So some of these would be operative
12 in different ways.

13 But the way I have them organized is the
14 way we are intending on proceeding to COL at this
15 point.

16 Another point of this is the term
17 "parameter" is a postulated number, an assumed number
18 by either the Applicant or an ESP or may be generated
19 by a reactor vendor, depending. Parameter is an
20 assumed number. A characteristic is an actual number,
21 something based on collection of data.

22 The first box, design parameter. Design
23 parameter are the postulated features of a reactor or
24 reactor that could be built at a proposed site. In
25 the case as this application, if you have not selected

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1 a specific design, then the PPE constitutes a
2 collection of design parameters that is, in fact, the
3 surrogate plant.

4 The site characteristic is an actual
5 physical environmental demographic feature of the site
6 based on collected data specific for that site.

7 The third definition of design
8 characteristic would be a characteristic that would be
9 defined based on actual features of a reactor or
10 reactors. One way you get that is if you reference a
11 design certification in the DCD. Those design
12 characteristics would be defined.

13 A site parameter are those assumed
14 parameters that in the case of a design certification,
15 the reactor vendor would postulate in order to define
16 a surrogate site that would be used by the reactor
17 vendor to demonstrate that that reactor technology
18 fits on a surrogate site, which hopefully would have
19 parameter size that would generally fit a wide range
20 of sites in the United States.

21 So site parameter is used when you do not
22 have a site. This is an important point because you
23 will not find site parameters in our PPE tables in the
24 application. We'll get to more details on that.

25 We didn't feel they were appropriate for

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1 the ESP application. The SAR that Mr. Zinke described
2 describes what you see in that first box. It defines
3 PPE design parameters. The SAR provides site
4 characteristics based on site specific data.

5 JUDGE TRIKOUROS: So clearly, then the top
6 two are ESP, the bottom two are DCD.

7 WITNESS CESARE: Yes.

8 Slide 6.

9 And it is exactly that point where this
10 comes together. We believe that this PPE approach is
11 consistent with Part 52. Part 52 doesn't require an
12 ESP applicant to define a specific reactor design. It
13 has three parts.

14 Based on those definitions, Subpart A, the
15 ESP generates the surrogate plant design, the PPE
16 parameters if you have not defined a plant. You could
17 define a specific plant, in which case you would have
18 design characteristics and site characteristics in
19 that ESP, if you knew you were going to do that. In
20 fact, there is one applicant doing that now.

21 So Part B would be design certification.
22 The second box on the previous slide would define the
23 design characteristics of that design and define in
24 its Chapter 2 of its DCD FSAR the site parameters that
25 it based on, that it did its calculations, dispersion

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1 coefficient π over Q . It would establish one, do the
2 dose calculations and show that this reactor would
3 pass Part 100.

4 Obviously then it is at COL that those
5 things come together. Depending on what the ESP
6 application is based on in the case of Grand Gulf ESP,
7 there's a postulated set of parameters. We must
8 demonstrate those fall within the design
9 characteristics that are established by the certified
10 design, if we fit a certified design, or if we fit one
11 that is not, then we would have to have information in
12 the COL application that would be sufficient to define
13 the design characteristics of that design.

14 Whether they come from a design
15 certification or an uncertified design, we would have
16 to demonstrate that those design characteristics fall
17 within the design parameters established in the ESP.

18 A summary of that is at COL the factors,
19 the values get compared properly. So the whole
20 purpose of this presentation is what is the PPE. It
21 is then for this application a set of postulated
22 design parameters that is expected to bound the design
23 characteristics of a reactor or reactors that might be
24 deployed at a site in the COL application or would be
25 a demonstration of the COL application.

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1 This, therefore, defines the surrogate
2 design for use at ESP for safety analyses and the
3 assessment in environmental impacts.

4 Slide 7.

5 This is the overview of this process.
6 It's simplified. There's some iterations interior to
7 them, but I believe it offers the basic flows. We'll
8 talk about each one of them in more detail.

9 The first is we began with the NEI
10 guidance. NEI 01-02 provided a PPE listing template
11 that you're familiar with. The second step is the
12 creation of what we refer to as the PPE work sheet, an
13 administrative tool that allows us to compare various
14 reactor designs. We considered the designs. They are
15 represented in this work sheet, and they are compared
16 in the work sheet.

17 The Step 3 we refer to as refinement. It
18 was a cooperative industry effort. Working with the
19 vendors, we would add parameters, refine the values,
20 select bounding values. If this is where the target
21 site capacity comes to play on being able to compare
22 the various range of technologies.

23 Going to Step 4 is an important step for
24 many of, I think, the Board questions, and that is
25 that we then review the PPE work sheet and apply

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1 certain criteria as to what would stay in the PPE
2 tables and which would be removed.

3 So Step 4 was an application of certain
4 criteria. Those three criteria is how is it used,
5 whether or not it's a site parameter, and is it
6 relevant to this particular Grand Gulf site, and
7 the --

8 JUDGE TRIKOUROS: But let me interrupt
9 you.

10 WITNESS CESARE: Yes.

11 JUDGE TRIKOUROS: Would you characterize
12 this as generic or Entergy specific?

13 WITNESS CESARE: I'll get to that more,
14 but it was generic up to a point, and I'll try to
15 point that out.

16 JUDGE TRIKOUROS: Because I think at four
17 we've departed from that, haven't we?

18 WITNESS CESARE: Right, right. It was at
19 four that the pilot applications made certain choices
20 and went different ways. And it is at five where you
21 end up with separate listings in the application, one
22 safety and one environmental for reasons that we'll
23 talk about.

24 Again, I said this is a cooperative
25 industry effort. It was a point to where we were

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1 common, working together, and an application final
2 stage creating the actual tables, we decided to do
3 something different. We have justification for that.

4 Generally this span from 2001 to 2002, the
5 applications all were submitted in 2003. That gives
6 the overview of the project. Now we'll go to the
7 process. Now we'll go to Slide 8 and talk about the
8 guidance.

9 NEI 01-02's guidance developed by NEI,
10 specifically the NEI ESP task force of which SERI was
11 an active participant. Its intent was to provide
12 guidance to the Applicant on how to create an
13 application for an ESP.

14 Appendix C of that was the listing of PPE
15 parameters. It was used as the starting point. All
16 template parameters are included in the work sheet.
17 I'll describe what the work sheet is on the next
18 slide.

19 The guidance was not intended to represent
20 a single design. It is guidance to an ESP applicant.
21 The template was not intended to represent an all
22 inclusive list. It was intended to be guidance for an
23 applicant to prepare an ESP application and the PPE
24 concept. It wasn't specific to a design.

25 The NRC did not endorse it. The NEI task

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1 force did not request the NRC to endorse it, nor was
2 it ever formally issued by NEI, but it was used as
3 extremely helpful guidance.

4 Slide 9.

5 Creation of the work sheet --

6 JUDGE TRIKOUROS: Oh, and by the way,
7 we're really adding a Block 6, I hope, in our
8 discussion. We're adding that block 6, which is what
9 from Block 5 ends up in the ESP permit or the permit
10 because it sounds like there's another division there
11 or at least I thought I heard a division there.

12 WITNESS CESARE: Yes, that is true. This
13 presentation is taking you to the development of the
14 ESP application, and we'll get to that detail, but the
15 PPE's presentation of the -- the PPE and the ER is the
16 PPE parameter listing. It is in the listing of
17 parameters that appears in the EIS. So we would
18 expect that to be the one that appears in the permit,
19 although we don't know that for sure.

20 Slide 8 -- no, back to 9.

21 The work sheet concept was discussed
22 generically with the staff as part of the ESP task
23 force in pre-application interface. This was a common
24 activity. The work sheet was generated. It was
25 available to offer a format, a tabulated listing,

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1 parameters down the vertical column with each
2 considered reactor technology columns along the right.
3 It basically then facilitated a comparison of the
4 various technologies.

5 There were three active ESP applications
6 at that time, the pilot ESPs. We developed just a
7 single work sheet collectively at that point to
8 support the applications.

9 This also involved the reactor vendors,
10 the pilot ESP projects, and various NEI staff and
11 industry representatives. The final step in this
12 creation was to obtain parameter values from the
13 vendors. The best available parameters values for
14 their technology, in some cases it came from certified
15 designs. In some cases it came from designs that were
16 not commercially available. They gave us their best
17 available information. Some of the designs were under
18 -- one design was under active certification review.
19 So there was a dynamic involved in this.

20 Next slide, Slide 10.

21 Refinement. This was also an Applicant-
22 industry effort. Some parameters based on our review
23 were added to the work sheet, cooling water flow
24 rates, heat rejection flow rates. Some parameters
25 that we thought were important to either safety or

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1 environmental impacts were added. Some values were
2 refined. It was based either on vendor input to the
3 task force and the group putting together the work
4 sheet or based on task force or the project review
5 putting it back to the vendor and the vendor giving us
6 numbers back.

7 The next important step is the selection
8 of bounding values. This is where the target site
9 capacity concept comes in. The bounding value for
10 each parameter was determined. The project site
11 capacity goal of 2,000 megawatts electric was
12 established and appropriate multiples of units or
13 modules were multiplied to come up with at least that
14 2,000 megawatt generating capacity at the site,
15 ranging slightly over 2,000 to up to 3,000 megawatts
16 electric.

17 The result at this point, a composite set
18 of bounding design parameter values for all
19 technologies considered.

20 JUDGE TRIKOUROS: Let me take it down to
21 an actual reactor point. Obviously you looked at two
22 with respect to plants like the ABWR, ESBWR, AP-1000.
23 I don't know how many PBMR modules, but --

24 WITNESS CESARE: Eight.

25 JUDGE TRIKOUROS: -- and I don't know how

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1 many ACR-700 plants we're talking about.

2 WITNESS CESARE: Twenty units for ACR-700.

3 JUDGE TRIKOUROS: Okay. So when you did
4 this, you consciously did that in terms of you looked
5 at actual reactor types, but assumed a given number of
6 them to add up to the total that we're talking about?

7 WITNESS CESARE: The reactor vendor gave
8 us a recommended collection of units or modules that
9 would constitute what we referred to as a single unit
10 plant, and so PBMR defined that as eight modules. ACR
11 defined that as a twin unit. IRIS defined that as
12 three units, all generating approximately 1,000
13 megawatts electric.

14 JUDGE TRIKOUROS: I see.

15 WITNESS CESARE: And to get our 2,000
16 megawatts, we doubled that. All parameter values were
17 doubled if it were appropriate. Some things were not,
18 some were. If it impacted at twice the impact to the
19 environment, make-up water flow, heat rejection,
20 effluents, some things were doubled. Temperatures,
21 cooling tower heights as discussed earlier on
22 accidents, they do not require accidents on multiple
23 units, and so the source term for the accident would
24 not be doubled. Parameters were doubled as
25 appropriately.

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1 There are differences in the work sheet at
2 this stage. Some sites could not accommodate two of
3 the large LWRs. So they may have only one of that
4 particular one.

5 JUDGE TRIKOUROS: I mean, clearly, there's
6 another ESP out there that's a one unit ESP, and I was
7 curious. Did each of you go to the vendors and ask
8 for your own specifications? Is that how it worked or
9 did they give you a generic set of specifications, you
10 know, a three-unit unit, two-unit unit, one-unit unit
11 concept?

12 WITNESS CESARE: There's seven
13 technologies involved. Four of the large single LWRs,
14 AP-1000, ABWR, ESBWR, ACR-700; theirs is one unit, I
15 think. Is that right?

16 JUDGE TRIKOUROS: Well, it's a two-unit
17 unit.

18 WITNESS CESARE: Two-unit. ESBWR, ABWR,
19 AP-1000, Iris (phonetic). Okay.

20 They gave us the specifications, Judge.
21 They basically defined what the parameter values would
22 be for their unit and told us what their recommended
23 collection of the way pebble bed would work best, and
24 we said that's -- so it's eight modules or twin units.

25 JUDGE WARDWELL: For 1,000 megawatts.

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1 WITNESS CESARE: For 1,000 megawatts.

2 Then when they gave that to us each
3 project had to decide do I have a big enough lake,
4 river, natural cooling source or do I have enough land
5 use to have a cooling pond and that defined what sites
6 could handle what, and then the work sheets departed
7 slightly.

8 There's another stage, as you pointed out,
9 where the PPE tables departed even further.

10 JUDGE TRIKOUROS: Okay, and just as a
11 connection point, in subsequent presentations we're
12 going to be talking about radiological analyses which
13 are then event specific, and so if there's a way to
14 tie the PPE table into that, fine. If not, fine, but
15 I'd like to just understand that.

16 WITNESS CESARE: One of the more important
17 parameters on the safety side is the source term for
18 accident analysis, and that source term is included.
19 However, it refers you to the bounding source term for
20 that particular reactor. It's probably best talked
21 about under Issue I as we talk about that.

22 JUDGE TRIKOUROS: Right, but I just wanted
23 to keep in mind that there is a tie-in between what
24 you're doing and Issue I.

25 WITNESS CESARE: Absolutely.

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1 JUDGE WARDWELL: And it's also fair to say
2 in regards to the environmental side that in an
3 analysis of impacts, you will use those PPE values,
4 and then the question arises do you also add that to
5 whatever is existing there to show the total impacts,
6 for instance, on a given receiving water body.

7 And it's kind of analogous to what's on
8 the safety side. There are other steps that are going
9 to go there in order to arrive at a number that's
10 going to be used to support any given evaluation.
11 Isn't that fair to say?

12 WITNESS CESARE: Yes. Well, that is what
13 we refer to as usage. How are the parameter and the
14 parameter value used?

15 This presentation is intended to take you
16 from GE NEI guidance to our PP application tables.
17 The staff's presentation after this will go through
18 some specific numbers showing you how those PPE
19 numbers were used in various analyses.

20 JUDGE WARDWELL: I think some of our
21 questions early on in the series of ones that we've
22 issued, we probably confused usage factors, if I can
23 use that phrase, with PPE values sometimes. That's
24 just a statement. You don't have to proceed.

25 Say, "Yes, that's a nice statement."

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1 (Laughter.)

2 WITNESS CESARE: It's a learning curve for
3 all of us.

4 JUDGE TRIKOUROS: But conceptually we
5 understood that we had a real site and a surrogate
6 plant on one end. We had a surrogate site and a real
7 plant on the other end, and that stuff comes together
8 at a real site and a real plant, and so we obviously
9 understood.

10 WITNESS CESARE: And I would add as well
11 that it is important to keep safety analysis and
12 environmental straight on what the approach is, and
13 that's also important in our rationale for having two
14 tables. So we'll get to that as well.

15 JUDGE WARDWELL: And part of that
16 reasoning is, as I would interpret it, and correct me
17 if I'm wrong, if that's what the question is, that you
18 may want to have a different bounding value to apply
19 to an environmental analysis for a particular factor
20 than you would necessarily have for the safety side.
21 You may want to have -- for instance, because NEPA
22 only requires reasonableness. You don't necessarily
23 have to arrive at a peak or the worst case or, you
24 know, the maximum of all surrogates, that type of
25 thing.

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1 So you're going to approach it from a
2 different aspects, and because of that you'll end up
3 with different sets of parameters in that table.

4 WITNESS CESARE: That is correct.

5 Slide 11.

6 Step four on the chart, it is at this
7 point when we are reviewing the work sheet now and
8 applying certain criteria and deciding whether or not
9 a parameter is retained on the work sheet to become a
10 PP application table and how is it going to be
11 presented in the application, in the environmental
12 report or the site safety analysis report?

13 Reviewed the work sheet against the SAR
14 and ER content to determine which parameters were used
15 in the safety analyses and the assessment of
16 environmental impacts.

17 Elected to have separate tables, one for
18 the SAR and one for the ER. Should note that the ER
19 contains all of the parameters that are in the SAR
20 listing.

21 Site parameters were not included in the
22 ER, the SAR ER PPE tables. We've already talked about
23 our rationale there, but one more time is the PPE's
24 purpose is a set of postulated design parameters
25 appropriate for an ESP at COL. The site parameters

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1 established by the certified design would be compared
2 with the site characteristics established in the ESP.

3 The site characteristics are addressed in
4 our application's SAR. There is no role for site
5 parameters to be in the PPE design parameter listing.

6 JUDGE WARDWELL: Except that there are
7 some assumptions made in arriving at a site
8 characteristic number. While it may be based on
9 actual site conditions, the accuracy or precision,
10 whichever you want to phrase it, of that particular
11 number has certain fundamental bases that you used in
12 deriving that characteristic to do an analysis.

13 And if, in fact, due to additional
14 investigations at the site, those numbers change, then
15 that has to be readdressed at the COL stage, and
16 that's where the comparison of values would come in.

17 Is that a correct understanding of the
18 situation?

19 JUDGE TRIKOUROS: For example, you have a
20 DCD designed to site parameter PMP of X. The site
21 characteristic has a PMP that's greater than X. So
22 there has to be a comparison made.

23 WITNESS CESARE: At COL.

24 JUDGE TRIKOUROS: At COL.

25 WITNESS CESARE: and what we do at the ESP

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1 stage is follow the standard review plan or the review
2 standard RS-02, collect the proper data from HMR 51,
3 52, and 53, the standards for PMP calculations,
4 calculate a maximum rainfall rate for this site in
5 Mississippi, specify that. The staff reviews it and
6 establishes that, so many inches per hour, as a
7 rainfall for this site.

8 At COL, when we finally select a
9 particular design, that design in the DCD has
10 specified its site parameter of rainfall, and we would
11 compare those two in Chapter 2 of the COL.

12 JUDGE TRIKOUROS: But you don't view a PMP
13 as a PPE, for example.

14 WITNESS CESARE: It is a site parameter.
15 it is a site characteristic. It's a characteristic of
16 the site. The site parameter is an assumed value,
17 assumed by the reactor vendor.

18 JUDGE WARDWELL: But that site
19 characteristic may change by the time we get to the
20 COL also. Is that not true? There may be some that
21 do change from what's there that's listed in Appendix
22 A of the SER right now?

23 JUDGE TRIKOUROS: If there's significant
24 new information, for example. Global warming is just
25 as an outrages kind of state.

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1 WITNESS CESARE: If we are aware of some
2 major change that would alter the calculations, then
3 that is a possibility.

4 JUDGE McDADE: But you wouldn't anticipate
5 changes.

6 WITNESS CESARE: We would not anticipate
7 that.

8 JUDGE McDADE: But not rule out the
9 possibility of.

10 WITNESS CESARE: Would not rule out the
11 possibility if we are aware of anything that has
12 changed at COL that would cause us to change that
13 particular site characteristic.

14 JUDGE TRIKOUROS: Well, let me ask my
15 question a little bit different. Do you consider site
16 characteristics a subset of PPE?

17 WITNESS CESARE: The PPE is a surrogate
18 plant. It is a set of postulated design parameters.
19 So site characteristics are not part of the PPE.

20 JUDGE WARDWELL: They are what you
21 consider to be absolute for what's taking place out
22 there --

23 WITNESS CESARE: At the site.

24 JUDGE WARDWELL: -- at that site, and you
25 think they're as good as they're going to get right

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1 **now, that they should not change barring something
2 really unusual.

3 WITNESS CESARE: They have been calculated
4 just like an FSAR, the ones that you're familiar with.
5 They have been calculated based on standards for
6 calculating these values, and the staff has reviewed
7 those per their review plan and established them and
8 listed them in appendix to the SER.

9 JUDGE TRIKOUROS: I just want to make sure
10 of the terminology. When they say PPE for your
11 application, it does not include site data.

12 WITNESS CESARE: It does not.

13 Slide 12.

14 We get to the final tables that are
15 appearing in the application's PPE listing of tables.
16 This concept that we have been discussing is described
17 from the NEI guidance, the creation of a work sheet.
18 The collection of reactor technologies, the setting of
19 target site capacity, the separation of the parameters
20 into two separate tables, and the removal of site
21 parameters is all discussed in our application in SAR
22 Section 1.3.

23 The result of this process generated SAR
24 PPE Table 1.3-1. It includes reference to a second
25 1.3 table which has source terms in it for effluents.

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1 This is the listing of the postulated bounding design
2 parameters used in safety analyses. The SAR also
3 includes our listing of site characteristics, which
4 were reviewed by the staff and listed in the staff's
5 SER. These are addressed in the SAR text, table or
6 figures as appropriate, and references to those things
7 are in SERI Exhibit 12 or Staff Exhibit 12. Pardon
8 me.

9 The ER PPE Table 301 is the listing of
10 postulated bounding design parameters that are used in
11 the site environmental impact assessments. This table
12 also references numerous other tables. Bounding
13 estimates or, rather, it provides references to other
14 parameters, characteristic design that are used in
15 environmental impacts, such as blow-down constituents,
16 effluents from diesel generators or gas turbines,
17 things that are necessary in the calculation of
18 environmental impacts.

19 JUDGE TRIKOUROS: Excuse me one second.
20 I'm sorry. I was paying attention to the monitor, not
21 here. Am I missing something? What are you working
22 from?

23 WITNESS CESARE: I'm from 12. I'm on 12,
24 Slide 12, Exhibit 19.

25 JUDGE TRIKOUROS: SERI Exhibit 19? I

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1 don't have that. Okay. Here it is. Well, now it's
2 there. It wasn't there before. That's fine.

3 WITNESS CESARE: It was blinking.

4 JUDGE TRIKOUROS: I don't know why there's
5 a delay in coming up on the monitor. Okay. Sorry.

6 WITNESS CESARE: Do I repeat that?

7 JUDGE TRIKOUROS: Yeah, I would appreciate
8 it. Sorry.

9 WITNESS CESARE: Okay. The entire slide,
10 sir?

11 Okay. The concept is provided in SAR 1.3.

12 JUDGE TRIKOUROS: I got that.

13 WITNESS CESARE: And SAR Table 1.3-1
14 contains the postulated design parameters that we used
15 exclusively on safety analyses. The SAR also
16 describes site characteristics. These are identified.
17 The references to the SAR, text, table and figures are
18 provided in Staff Exhibit 12.

19 The ER PPE Table 301 provides the listing
20 of postulated design parameters used for environmental
21 impacts. It also references numerous tables that would
22 provide data on effluents, source terms, radiological,
23 gaseous, normal effluents, and other parameters that
24 are necessary to define, to evaluate environmental
25 impacts.

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1 JUDGE TRIKOUROS: So if I summed those
2 three, do I get anywhere near the NEI document?

3 WITNESS CESARE: Yes, you do. There are
4 some parameters that were not relevant to our design,
5 once through cooling ponds, that type of thing, and so
6 those would not be in there. So you will see a lot of
7 "noes" in the exhibit, and that's because of either
8 site parameters or not relevant.

9 JUDGE TRIKOUROS: Okay. So if I summed
10 these three and add N/As, I end up with the NEI
11 essentially?

12 WITNESS CESARE: Essentially.

13 JUDGE TRIKOUROS: Okay.

14 WITNESS CESARE: That's the end of this
15 presentation.

16 JUDGE McDADE: Are we now going to move --

17 WITNESS CESARE: I have other material to
18 go, repeating some of this material on target site
19 capacity. I've already talked through the methodology
20 of what the target site capacity is and how we arrived
21 at it.

22 MS. SUTTON: There are additional slides
23 and additional presentation if you'd like more detail
24 on that.

25 JUDGE McDADE: Well, I mean specifically

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1 are we talking about SERI Exhibit 33 at this point
2 or --

3 MS. SUTTON: That's correct.

4 JUDGE McDADE: -- something before that?

5 MS. SUTTON: No, SERI Exhibit 33.

6 JUDGE TRIKOUROS: If I were to ask you if
7 you could build an ESBWR at this site, assuming the
8 ESBWR was 4,500 megawatts thermal, and this site is
9 qualified for 8,600 megawatts thermal. Could you
10 simply put an ESBWR in this site without doing
11 anything more?

12 WITNESS CESARE: No.

13 JUDGE TRIKOUROS: I knew the answer was no
14 there, and I want to understand why it's no.

15 WITNESS CESARE: Exhibit 33, SERI Exhibit
16 33, slide 4.

17 JUDGE TRIKOUROS: Okay, good.

18 WITNESS CESARE: This is one of the Board
19 inquiry questions, hypothetically what if you go over
20 4,300. So we're attempting to address what is the
21 process at COL that we've been talking about of
22 exceeding the maximum megawatt thermal parameter.

23 At COL per 52-79, we must demonstrate that
24 the selected design falls within design parameters
25 established at ESP. Forty-three hundred megawatts

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1 thermal is a PPE design parameter. If that parameter
2 is not bounding, such as the example you gave, the
3 application must request and include a request for
4 variance. That request would be per 52-93, which
5 requires us to provide sufficient information to
6 justify that.

7 And what that means is the application
8 would evaluate the higher megawatts thermal for
9 impacts to assumptions, analyses, and results of ESP
10 used in a safety or environmental analyses.

11 JUDGE TRIKOUROS: No, i'm not talking
12 about two ESBWRs now. I'm talking about one.

13 WITNESS CESARE: Yeah, one.

14 JUDGE TRIKOUROS: Everything you said
15 earlier indicated that when you were interfacing with
16 the vendor, they weren't giving you the data for one
17 4,300 megawatt plant. They were giving you data for
18 more than one plant.

19 WITNESS CESARE: I didn't understand the
20 question or I wasn't clear. They gave us data on a
21 per unit module basis, and gave us recommendations on
22 how they go together.

23 It's being recommended I go ahead and
24 start at the beginning of this. So I will if you
25 don't mind.

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1 Slide 1.

2 JUDGE WARDWELL: To finish your last
3 statement though, they gave you a unit equivalent of
4 - 1,000 megawatts electric as their black box that you
5 would then manipulate --

6 WITNESS CESARE: Yes, sir.

7 JUDGE WARDWELL: -- so that you could
8 compare.

9 WITNESS CESARE: They gave us recommended
10 modules that would go together that would create 1,000
11 megawatts electric.

12 JUDGE WARDWELL: Right.

13 WITNESS CESARE: But we had data.

14 JUDGE WARDWELL: Which varies. The number
15 of those modules at any one vendor would have would
16 depend upon what their design is and the output of
17 that design to create 1,000 megawatts electric that
18 then you took and multiplied it appropriately to come
19 up with 2,000, which translates to your megawatts
20 thermal.

21 WITNESS CESARE: To achieve our site goal.

22 JUDGE WARDWELL: Right.

23 WITNESS CESARE: My apologies. It was
24 probably logical to start at the beginning. So four
25 slides. We'll start on Slide 1 of SERI Exhibit 33.

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1 This presents the concept of the target
2 site capacity and how we have used it. The
3 approximate target electrical output for the new
4 facility that could be located at the Grand Gulf ESP
5 site was established to be approximately 2,000
6 megawatts electric. The reactor technologies we've
7 been talking about represent a wide range of
8 electrical output, and the target site capacity was
9 selected and to facilitate comparison we first defined
10 the number of units or modules that were sufficient to
11 produce at least 1,000 megawatts electric per vendor
12 recommendations. This number of units or modules
13 that's insufficient to generate that electric output
14 we refer to as a single plant unit.

15 Some examples is one pebble bed module
16 reactor is equivalent or is recommended by the vendor
17 to be eight modules achieving approximately 1280
18 megawatts electric. You can read the rest of them.

19 The capacity range for these single plant
20 units went from 1,005 megawatts to 1,500 megawatts.
21 1,005 was set by the Iris 3 units, 1,500 megawatts by
22 the ABWR.

23 Second slide.

24 PPE bounding values had been established
25 for each parameter for 1,000 megawatt single plant

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1 units. This is the data that came from the vendors.
2 To achieve at least 2,000, the single plant unit was
3 doubled, giving us a range of 2,010 to 3,000 megawatts
4 electric. This represents thermal of 4,800 megawatts
5 thermal to 8,600 megawatts thermal.

6 The bounding values for the PP parameters
7 were doubled where appropriate based on a parameter-
8 by-parameter evaluation. Examples, blow-down flow
9 rate and make-up flow rate were doubled with two
10 plants. Things that were not doubled were logical to
11 engineering principles, flow-down temperature, cooling
12 tower height. Regulatory-wise PPE line item 952 was
13 not doubled because that was a source term for post
14 accident airborne effluents. It is not required to
15 take a coincident accident at the site.

16 The result is a composite set of bounding
17 design parameters that support the project goal of at
18 least 2,000 megawatts electric.

19 Slide 3.

20 A couple of points. In this process, the
21 bounding thermal reactor power, PPE line item 17.3,
22 was determined to be 4,300 megawatts thermal per unit
23 set by the General Electric ABWR design. Other
24 bounding PPE parameter values, however, were
25 determined independently from this 4,300 megawatt

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1 value. Each parameter value was set based on that
2 design and which came up to be bounding.

3 Three points. We might think in times
4 past in a Part 50 scenario where you have a single
5 plant where the design, the reactor thermal power, the
6 characteristics and engineering design principles are
7 linked in a coordinated fashion with the turbine, the
8 condenser, the cooling water discharge intakes, all
9 dovetailing together in an integrated package.

10 The PPE is not that. It is a collection
11 of design parameters for the surrogate plant. As was
12 discussed earlier, the radiological liquid effluent is
13 the worst case combination of all seven technologies,
14 the maximum nuclide Curies for each nuclide and put
15 together.

16 A second point is that each -- and this is
17 an important point -- each parameter is used in its
18 own regard, in its own analysis. If you're interested
19 in severe accident impact, you need to use 4,300
20 megawatts thermal because that's the way the code
21 works for a total core inventory for severe accident.

22 If you're interested in thermal plume in
23 the Mississippi River, one would need the temperature
24 and the flow rate. You wouldn't use 4,300. You would
25 use that value. You would use source terms from the

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1 accident analysis.

2 JUDGE WARDWELL: Now I understand. So the
3 reason the ESBWR -- and I shouldn't use -- I don't
4 mean to single that plant out.

5 The reason you couldn't put a 4,500
6 megawatt plant there alone is because of all the
7 single unit evaluations that you did that were based
8 on 4,300 megawatts, the single unit meaning where the
9 parameters were not doubled or factored in any way.

10 If the ESBWR came in at 4,500 or it came
11 in at 4,250, we still would have to evaluate each
12 parameter to make sure that we understood its
13 integrated package and that it has no -- we would have
14 to follow the process.

15 JUDGE WARDWELL: Which you would have to
16 under any circumstance.

17 WITNESS CESARE: Have to do it under any
18 circumstances.

19 JUDGE WARDWELL: Maybe we should leave it
20 at that. And that's really what it all boils down to.
21 You've got a PPE list there, and once you get to the
22 cold stage, you're going to compare the actual values
23 that you're dealing with to those, and if they meet,
24 fine, and in those areas where they don't meet, you've
25 got to do an additional analysis to show that, in

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1 fact, the site can still handle that particular design
2 for that particular analysis that's associated with
3 that parameter.

4 WITNESS CESARE: Yes, sir. If we selected
5 a design that everything fit except for blow-down
6 rate, we would have to deal with that blow-down rate
7 analysis, and that would be dealt with in supplemental
8 COLA ER Chapter 3, where we demonstrate that the PPE
9 postulated design parameters fall within the design
10 characteristics of the selected design. That would be
11 presented in Chapter 3 of the COLA ER.

12 JUDGE WARDWELL: Oftentimes the word
13 "variance" has a negative connotation to outside
14 public, that being that maybe an applicant is getting
15 away with something or they're asking to get away with
16 something.

17 In fact, as applied here, all you're doing
18 is saying I don't meet the PPE for this given
19 parameter. I've got to basically redo the analyses,
20 and you're not having to redo them because you can use
21 your knowledge base that you used with the PPE value,
22 but you have to redo those with the new actual design
23 value to assure that the site is copasetic with that
24 particular application.

25 WITNESS CESARE: Yes, Your Honor.

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1 Actually it's just the opposite, if that is the public
2 impression, because the variance requires reanalysis,
3 submittal in the application. Fifty-two, ninety-three
4 requires the staff to apply the same standards that
5 were applied in the review, and it's subject to
6 litigation.

7 JUDGE WARDWELL: And if you had never
8 submitted an ESP and just did the project from scratch
9 at the COL stage, you'd never see that variance
10 request because you'd just naturally use the plants
11 you've selected in part of the analyses.

12 WITNESS CESARE: Correct.

13 JUDGE TRIKOUROS: One of the confusing
14 points is that in your PPE you number them in
15 accordance with what I think is the NEI numbering
16 guidance. So there are big gaps. You go from one to
17 four and to six to nine, and you know, likely among
18 the two report, and that was a little bit confusing
19 initially.

20 JUDGE WARDWELL: And that gap is there
21 because some of them don't apply to your particular
22 site, and others you're deferring to the COL stage
23 anyhow. Is that a fair assumption or is it --

24 WITNESS CESARE: The three criteria
25 generally apply. They do not appear because they're

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1 not relevant. They do not appear because they are
2 site parameters, and they may not appear in the safety
3 one because they're in the ER on, usage.

4 JUDGE TRIKOUROS: But you kept that
5 numbering scheme because?

6 WITNESS CESARE: Because the work sheet
7 was founded on the NEI guidance, and to simply keep up
8 with accounting, to know that when someone speaks of
9 parameter 2.5-2, we know what they're talking about.
10 We understand why there is confusion.

11 JUDGE WARDWELL: And if you hadn't
12 provided those numbers, someone on this Board would
13 have asked you what's the number at the NEI,
14 associated NEI number more than like, correct?

15 JUDGE TRIKOUROS: You can't win, right?

16 (Laughter.)

17 WITNESS CESARE: It's the process.

18 That concludes SERI's discussion of the
19 process of going from the NEI guidance to the PPE
20 tables, and anticipating because of the Board's
21 inquiries discussing megawatts thermal, the 8,600,
22 that hopefully is a good point for the staff now to
23 talk about how the PPEs were used in the staff's
24 review.

25 JUDGE McDADE: Okay. We are probably

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1 going to take a break here very shortly. We'll take
2 that one break and then go through and break at a
3 convenient point some time between five and six, but
4 before we do take a break and after the break have the
5 staff's presentation, while it's still fresh in your
6 mind, is there anything specifically that was said in
7 the Applicant's presentation that you feel needs
8 amplification, modification, or correction?

9 WITNESS HARVEY: This is Brad Harvey with
10 the staff. There may be one point I want to add which
11 may be clarification and that there may be a couple of
12 site characteristics that are in the ESP that are not
13 on the NEI table. For instance, in evaluating the
14 design of an ultimate heat sink, Reg. Guide 1.27
15 requires that you look at the worst one-day and then
16 five-day cooling to make sure you have adequate water
17 cooling capability and a 30-day water supply.

18 And so those I do not believe appeared in
19 the NEI table, but does appear in the staff's and
20 Applicant's site characteristics table.

21 So my point is that the NEI table is not
22 necessarily 100 percent complete, and that's one case
23 where it is not.

24 JUDGE McDADE: Okay.

25 JUDGE WARDWELL: Do you -- sorry.

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1 JUDGE McDADE: No, go ahead.

2 JUDGE WARDWELL: Do you agree with the
3 Applicant that it's unlikely that any of the site
4 characteristics presented in Appendix A wouldn't
5 change at the COL stage or would change?

6 WITNESS CESARE: Unlikely that they would
7 change between now and this COL stage.

8 JUDGE WARDWELL: Okay. I switched my
9 things around as I went through my question.

10 WITNESS HARVEY: Speaking from my
11 expertise in meteorology, there is a slight potential
12 because of the global warming, but I generally, no,
13 don't think you would expect that to occur.

14 JUDGE McDADE: So it's a function then
15 with the COL stages a year from now would dedicate
16 from now to --

17 WITNESS HARVEY: And that's actually or 20
18 years from now that that's true, too.

19 JUDGE WARDWELL: But there's still a
20 mechanism if, in fact they do change. You would still
21 look at those to make sure that they haven't changed,
22 but you wouldn't expect them to change. Is that a
23 fair assessment?

24 WITNESS HARVEY: We may not do that across
25 the board, but if we have suspicions that something

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1 might change, we would.

2 JUDGE TRIKOUROS: But the impetus is on
3 the Applicant to provide new and significant
4 information to you.

5 WITNESS HARVEY: That is correct.

6 JUDGE McDADE: Okay. It is now 3:35. if
7 we take a 15-minute break, will that be sufficient for
8 the staff?

9 MR. RUND: Yes, that would. Thank you.

10 JUDGE McDADE: And for the Applicant?

11 MS. SUTTON: Yes.

12 JUDGE McDADE: And for the staff, without
13 taking into consideration the questions that we may
14 ask that will slow you down, how long do you
15 anticipate that your presentation on Hearing Issue G
16 would be?

17 WITNESS WONDER: I think it's about 45
18 minutes, sir.

19 JUDGE McDADE: Okay. We are in recess for
20 15 minutes, until 3:50.

21 (Whereupon, the foregoing matter went off
22 the record at 3:38 p.m. and went back on
23 the record at 4:00 p.m.)

24 JUDGE McDADE: The hearing will come to
25 order.

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1 A couple of administrative matters before
2 we get started. I believe the staff indicated that
3 they had curriculum vitae for various people. Do you
4 have those available yet?

5 MR. RUND: Yes, we do. They're marked as
6 Staff Exhibit 51 and 52.

7 JUDGE McDADE: Okay, and I believe that
8 I've already admitted Exhibits 51 and 52. If I have
9 not previously, I do do so now, and if you could hand
10 those up to Ms. Wolf. And you have also given copies
11 to the Applicant?

12 MR. RUND: Yes, we have.

13 JUDGE McDADE: Okay. One other thing I
14 would ask, and this is sort of a post hearing
15 requirement, this is the third in a series. the first
16 one had to do with the review of the transcript to
17 make any corrections in a timely manner and to get
18 back to us now how much time you're going to need for
19 that.

20 The second had to do with getting an
21 updated exhibit list that will include all of the
22 exhibits, will be marked Staff and SERI Exhibits 1(a),
23 respectively.

24 One other thing. There have been a number
25 of witnesses during the course of the hearing who did

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1 not appear on the prefiled testimony who have been
2 added during the course of the proceeding and testify.
3 So I would ask again just to make it easier for
4 anybody reviewing the record who didn't have the
5 benefit of being here if after the hearing is
6 completed, if you could submit an updated witness list
7 that would just list for each of the hearing issues
8 the names of the witnesses who appeared for the staff,
9 and that would be Staff Exhibit 1(b) and then the same
10 things with regard to SERI. Again, after the hearing
11 is over one page that would just -- or however many
12 pages is necessary -- but just would list Hearing
13 Issue A and the names of the witnesses who appeared,
14 Hearing Issue B, and that would be SERI Exhibit 1(b),
15 and the same thing. It just can be E-mailed to Ms.
16 Wolf and to the court reporter so that someone
17 reviewing the record will be able to identify the
18 witnesses quickly.

19 MS. SUTTON: We will do so.

20 JUDGE McDADE: Okay. Any other
21 administrative matters we should take care of before
22 we get started?

23 MR. RUND: As far as scheduling goes, the
24 staff has a strong preference that we try to finish
25 Hearing Issue H tonight, even if that requires us

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1 going past six, if the Board will allow us to stay a
2 little later than we had talked about earlier to get
3 that done. We have several witnesses that have
4 flights, have come from out of town and have flights,
5 if it's possible, depending on --

6 JUDGE McDADE: Let's revisit that at the
7 end of G. I think it's going to be a real function of
8 how long G takes and once it's done, then we'll be
9 able to say how long you think H is going to take and
10 we'll see. You know, if it's going to be a little
11 bit after six, probably we can keep on going. If it's
12 going to be a little bit after eight, maybe not.

13 So let's just wait and get this hearing
14 issue over with, and then we'll revisit that.

15 MR. RUND: Thank you.

16 JUDGE McDADE: Okay. Please proceed.

17 I actually would like to get I over
18 tonight if at all possible, but.

19 WITNESS WONDER: George Wonder, project
20 manager for the staff.

21 I plan to be brief in my introductory
22 remarks. Much of what I planned to say has already
23 been covered by SERI. So I will be even more brief.

24 Grand Gulf ESP applicants have not
25 identified a design for potential future plant.

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1 Rather they chose to bound various approaches, various
2 possible designs using the plant parameter envelope
3 approach.

4 The Grand Gulf PPE was developed using a
5 methodology developed by the industry. They started
6 with the work sheet containing a large number of
7 parameters and refined it until a bounding envelope
8 for the site was found.

9 PPEs are custom entities, and there's no
10 reason that any two should be identical. The staff
11 reviewed the Applicant's PPE values and found them to
12 be not unreasonable.

13 Next slide.

14 The environmental and safety PPEs are
15 different, but they are not inconsistent. The safety
16 evaluation looks at things from a functional,
17 operational and safety standpoint. For example for an
18 environmental evaluation they look at the height of
19 the top of the stack as being a limiting value because
20 of aesthetics. The safety evaluation may look at the
21 bottom of the same stack as being a limiting height
22 because ground level released give higher outside
23 doses.

24 The same parameter, therefore, can be
25 looked at in different ways for different purposes.

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1 As mentioned earlier, PPEs are by necessity site
2 specific. There's no reason that the PPE listed in
3 the NEI document will match the PPE for every site.

4 One reason that the PPE in the Applicant's
5 SSAR differs from that in the NEI document is that
6 some of the things listed in the NEI document as part
7 of the PPE were determined by the Applicant to have
8 corresponding site characteristics. These items,
9 therefore, appear in the table of site characteristics
10 rather than in the PPE. This table is in Appendix 8
11 of SSAR and will be in the ESP.

12 For presentation on PPE values and their
13 use in meteorological analysis, I would like to
14 introduce staff physical scientist Brad Harvey.

15 JUDGE McDADE: And, Mr. Harvey, before you
16 get started, just one thing real quickly. I just
17 wanted to note for the record I believe that you have
18 been referring to and are going to be continuing to
19 refer to a document that has been marked as Staff
20 Exhibit 17. That's correct?

21 MR. RUND: That is correct.

22 JUDGE McDADE: So the record will reflect
23 that. Sorry for the interruption. Please continue.

24 WITNESS HARVEY: Certainly. My name is
25 Brad Harvey. I am a physical scientist in NRC's

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1 Office of Nuclear Reactor Regulation.

2 I was responsible for the review of
3 meteorology for the site safety analysis report, and
4 as an example, we'll briefly discuss how the PPE
5 values used in a meteorological related analysis
6 support the maximum site reactor power requested by
7 the Applicant.

8 There are three meteorological related
9 analyses that use PBE values presented in this
10 Applicant's site safety analysis report.

11 One, the evaluation of cooling tower plume
12 impacts from the operation of the normal plant heat
13 sink.

14 Two, the generation of long-term
15 atmospheric dispersion site characteristics for use in
16 evaluating the consequences of a routine operational
17 releases.

18 And, three, the generation of short-term
19 atmospheric dispersion site characteristics for use in
20 evaluating the consequences of design basis accident
21 releases.

22 The PPE values used to evaluate normal
23 plant heat sink cooling tower plume impacts include
24 the condenser heat exchange duty and the cooling tower
25 height. The condenser heat exchange PPE values

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1 defined as a design value for the waste heat rejected
2 to the circulating water system across the normal heat
3 sink condensers. The condenser heat exchange PPE
4 value of 10.7 E to the ninth BTU per hour is
5 equivalent to approximately 3,100 megawatt thermal,
6 and is not unreasonable when compared to the maximum
7 unit PPE value of 4,300 megawatt thermal.

8 JUDGE TRIKOUROS: Could I interrupt you
9 one second? I've seen a lot of cooling tower plumes,
10 and humidity seems to be an important consideration as
11 to the height and wind velocity as well seems to be
12 very important to whether that plume is very broadly
13 applies to the environment or just sort of disappears
14 rather quickly. Is that something that you factor in
15 at all?

16 WITNESS HARVEY: Yes. The cooling tower
17 analysis is one presented in the SSAR by the
18 Applicant, who predicts the length of the plume, and
19 I do believe they used meteorological data. I'm not
20 sure if they used the on-site data or something nearby
21 from either Vicksburg or Jackson.

22 But, yes, the cooling tower model does --
23 there is input in meteorological hourly,
24 meteorological data into it.

25 The normal plant heat sink cooling tower

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1 height PPE value of 60 feet for the mechanical draft
2 cooling tower option or 475 feet for the natural draft
3 cooling tower option are also not unreasonable heights
4 for these type of cooling tower units.

5 The PPE values to generate the long-term
6 atmospheric dispersion site characteristics is the
7 airborne radiological effluent release elevation,
8 which was specified to be at ground level. This is a
9 conservatively bounding assumption for this PPE value.

10 The PPE values used to generate the short-
11 term atmospheric dispersion site characteristics
12 include the airborne radiological effluent release
13 elevation and the minimum distance to the site
14 boundary.

15 The airborne radiological effluent release
16 elevation was specified to be at ground level, which
17 is a conservatively bounding assumption for this PPE
18 value. The minimum distance to the site boundary PPE
19 value of 841 meters is consistent with the SSAR
20 Section 2.1.2 definition for the exclusion area
21 boundary, and is also consistent with the exclusion
22 area boundary site characteristic listed by the staff
23 in Appendix A-23 of the FSER.

24 In conclusion, the staff found that the
25 meteorological analyses that use the Applicant's

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1 normal plant heat sink and airborne radiological
2 effluent release elevation PPE values support the
3 maximum site reactor power requested by the Applicant.

4 I would now like to turn the staff's
5 presentation over to Steven Klamentowicz, who will
6 describe how the radiological routine effluent release
7 source term PPE values support the maximum site
8 reactor power requested by the Applicant.

9 WITNESS KLAMENTOWICZ: Steve Klamentowicz.

10 As far as the PPE value used in the
11 radiological source term, there was prior discussion
12 earlier today about the composition of the
13 radionuclides derived as the highest from all of the
14 proposed designs. The staff took the source term as
15 provided by the licensee and then ran those values
16 through the various computer codes.

17 There's nothing more to be said other than
18 we did use the maximum source term as provided to us,
19 and we found that to be a reasonable source term, a
20 very conservative source term.

21 JUDGE McDADE: Can you just briefly
22 explain the basis for those computer codes?

23 WITNESS KLAMENTOWICZ: The basis for the
24 computer codes. There were two codes used, one for
25 the gaseous effluents. That's GASPAR II, and the one

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1 for the liquid is LABTAP II. Those are computer codes
2 the NRC has used since the beginning of time to
3 calculate routine effluents, calculate dose to members
4 of the public. It uses the methodology and dose
5 conversion factors that are contained in Regulatory
6 Guide 1.109, along with the site specific.

7 Regulatory Guide 1.109 contains generic
8 site parameters, site characteristics, such as
9 shoreline width, whether it's into a river, lake, et
10 cetera. It also has the human consumption factors.

11 The basis of the code is that it's to give
12 the dose to a maximum hypothetical individual. Those
13 parameters, methodology equations from Regulatory
14 Guide 1.109 are incorporated into the GASPAP and
15 LABTAP computer codes.

16 JUDGE TRIKOUROS: Now, the Applicant did
17 the NRC dose code series calculations using GASPAP and
18 LABTAP?

19 WITNESS KLAMENTOWICZ: That's correct.

20 JUDGE TRIKOUROS: And you confirmed?

21 WITNESS KLAMENTOWICZ: We took their
22 source term and independently ran it through the same
23 computer codes, and we got the same answers.

24 JUDGE TRIKOUROS: All right, and you used
25 their input deck and --

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1 WITNESS KLAMENTOWICZ: With their site
2 specific parameters, yes.

3 JUDGE TRIKOUROS: Okay. There will be a
4 question on that tomorrow. So we can drop that for
5 now.

6 WITNESS KLAMENTOWICZ: That's all I have.

7 JUDGE McDADE: Mr. Wilson, are you next?

8 WITNESS WILSON: My name is Jim Wilson.
9 I'm the environmental project manager for the staff's
10 review of SERI's application for an early site permit
11 at the Grand Gulf site.

12 I'm going to provide a brief overview of
13 how the staff used the plant parameter envelope in its
14 environmental review.

15 Could I have Slide 7 in Staff Exhibit 17,
16 please?

17 The process George just described for the
18 safety review using the PPE approach also largely
19 applies to the staff's environmental review, which
20 I'll briefly summarize. In its application, SERI did
21 not provide a detailed design of a reactor, but rather
22 used a plant parameter envelope as a surrogate for a
23 nuclear power plant and its associated facilities.
24 the PPE is a set of values that SERI expects will
25 bound the design characteristics of the reactor or

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1 reactors that might be constructed at a given site.
2 In effect, again, it's a surrogate for actual reactor
3 design information.

4 The PPE reflects the upper or lower bound
5 values for each parameter it encompasses rather than
6 the characteristics of any specific reactor design.
7 The PPE is discussed in detail in Section 3.2 of the
8 staff's environmental impact statement and the
9 complete list of PPE values that were used in the
10 staff's environmental review are provided in Appendix
11 I of the Grand Gulf EIS.

12 Because the SERI PPE values did not
13 reflect a specific design, they were not reviewed by
14 the NRC staff for correctness. However, the NRC staff
15 made a determination that the application was
16 sufficient to enable the staff to conduct this
17 independent environmental review.

18 The staff performing the environmental
19 review used the review guidance in the environmental
20 standard review plan and Attachment 3 to review
21 Standard 002 to insure a thorough, consistent, and
22 disciplined review of the application. The staff
23 adopted the ESRP surrogate for design specific values.

24 The staff expected that SERI would provide
25 sufficient information for the staff to develop a

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1 reasonable independent assessment of potential impacts
2 to specific environmental resources. In some cases
3 the design specific information called for in the
4 environmental standard review plan was not provided in
5 the application because it did not exist or was not
6 available. Therefore, the NRC staff could not
7 directly apply the ESRP guidance in those review
8 areas.

9 In those cases the NRC staff used its
10 experience and judgment to adopt review guidance in
11 ESRP and to develop assumptions necessary to evaluate
12 impacts to certain environmental resources to account
13 for the missing information.

14 Key assumptions used in the staff's
15 review, that is, those assumptions that were necessary
16 to reach a single magnitude of impact determination,
17 are tabulated in Appendix J of the EIS.

18 Considering the PCE values to be bounding
19 parameters, the staff's value serves as a bounding
20 estimate of the potential environmental impacts
21 resulting from constructing and operating one or more
22 new nuclear units at the ESP site.

23 Slide 8.

24 Having discussed the similarities in the
25 staff's safety and environmental review, I'd like to

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1 point out that they differ in some important respects.
2 The safety review mandated by the Atomic Energy Act
3 was based on bounding analysis using adverse
4 conditions resulting in conservative estimates to
5 insure that staff safety design criteria and radiation
6 protection regulations are met.

7 This is in contrast to the environmental
8 review mandated by NEPA, which is governed by the rule
9 or reason and takes a hard look employing best
10 estimate methodology to evaluate reasonably
11 foreseeable impacts.

12 Next slide.

13 The safety environmental reviews also have
14 differing perspectives. The safety review evaluates
15 the effect of the site and the environment on the
16 facility, for example, the potential for flooding of
17 the facility by an adjacent body of water. The NEPA
18 review, on the other hand, evaluates the impacts of
19 the facility's construction and operation on the
20 environment and, to extend the water example, the
21 impacts on water quality and aquatic biota.

22 Next slide.

23 Finally, the NEPA review considered the
24 impacts of construction operation for all of the
25 environmental issues and was considered a full scope

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1 review. It included the analysis necessary for
2 consideration of all plant features and individual
3 plant parameters. This is in contrast to the safety
4 review, which analyzed the parameters necessary to
5 make a siting decision and was, therefore, considered
6 a limited scope review.

7 In that review the staff did not evaluate
8 the design of the facility and certain parameters did
9 not have a bearing on the siting decision. The list
10 of plant parameters, treatment and values for each
11 review was different depending on the scope, analyses
12 and objectives necessary to complete the staff's
13 review.

14 Van Ramsdale from PNNL will now briefly
15 discuss the staff's review of the PPE and the
16 determination that none of the parameter values were
17 unreasonable given the maximum reactor power of 8,600
18 megawatts thermal.

19 WITNESS RAMSDALE: Van Ramsdale.

20 In addressing the support of or
21 environmental analyses in support of the maximum
22 power, I looked at the plant parameter envelope and
23 considered its potential impacts on the analyses
24 involved.

25 I put the analyses or impact areas in

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1 three groups: radiological impacts, hydrological and
2 aquatic ecology impacts, and then terrestrial ecology
3 and land use socioeconomic impacts.

4 The first two are very directly related to
5 reactor maximum power. The last three are secondarily
6 related. There have been no major impacts found in
7 those areas at existing power plants with natural
8 draft cooling towers. Therefore, I'm not going to
9 address them further.

10 The radiological impacts are directly
11 related to maximum power because maximum power helps
12 determine the radionuclide inventory in the core of
13 the reactor. It, however, does not by itself specify
14 the impacts on the environment. The impacts on the
15 environment are related both to reactor core inventory
16 and to the release path, which material takes go in
17 from the core to the environment. Therefore, it is
18 design specific as well as power specific.

19 Hydrological and aquatic ecology impacts
20 are related to reactor power because they're, in
21 general, related to the heat rejection from the normal
22 cooling system. Therefore, heat rejection is one
23 factor, but normal heat sink design, including cooling
24 system type, intakes and out-fall design and other
25 factors, enter into the impacts.

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1 Therefore, there is not a one-for-one
2 relationship between maximum reactor power and
3 environmental impacts in those areas.

4 In the other areas, we have impacts
5 related to such things as drift, which are related to
6 concentration cycles in the cooling water, which is
7 not necessarily related to power.

8 Next slide.

9 In the next slide, I examine the plant
10 parameter envelopes related to power. First is the
11 single unit maximum power, 4,300 megawatts. The
12 second, in the discussion we've had just a few minutes
13 ago, you can see how we get to 8,600 megawatts
14 thermal.

15 I then compared the heat rejection numbers
16 given in BTUs per hour, converted that to megawatts,
17 and it comes out about 3,140 megawatts per unit, or
18 about 6,300 megawatts for a two-unit facility, and
19 it's the facility that we are evaluating here if the
20 site were developed to its maximum. So 6,300 is the
21 appropriate number.

22 I looked at the evaporation --

23 JUDGE TRIKOUROS: Sorry. How does 6,300
24 compare to 8,600?

25 WITNESS RAMSDALE: That is the condenser

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1 heat exchange. That's the heat rejected. That is the
2 fraction of the energy that is not related to
3 electricity.

4 JUDGE TRIKOUROS: I'm sorry. Yeah, that's
5 fine. I'm sorry.

6 WITNESS RAMSDALE: Looked at the
7 evaporation rate, made some assumptions, and did some
8 simple thermodynamic calculations, and the evaporation
9 rate equates to about 6,200 megawatts. If you look at
10 the blow-down flow rate, again, with thermodynamic
11 calculations, you come up with about 100 megawatts so
12 that the heat lost through blow-down and evaporation
13 are essentially the same as the heat across the
14 condenser, all a sanity check.

15 So that we are working with numbers that
16 appear to be or at least we can't reject the
17 hypothesis that they're inconsistent. We can't reject
18 the hypothesis that they are consistent. I'm sorry.

19 The next slide looks at what we did in the
20 radiological analysis. For normal operations we use
21 the composite source term developed on a radionuclide
22 by radionuclide basis. We can't assign a power level
23 to that source term.

24 For the design basis accident, we looked
25 primarily at the ABWR source term, ABWR and the AP-

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1 1000 reactors. We based our analysis on the design
2 control documents and staff analyses that were done in
3 the design certification process, making appropriate
4 corrections for the difference between the design
5 meteorology parameters and the site specific
6 parameters.

7 JUDGE TRIKOUROS: Now, when you say design
8 basis accident, what are you referring to
9 specifically?

10 WITNESS RAMSDALE: Those accidents that
11 are defined in --

12 JUDGE TRIKOUROS: You mean the spectrum of
13 design basis accidents.

14 WITNESS RAMSDALE: Right.

15 JUDGE TRIKOUROS: Not an accident.

16 WITNESS RAMSDALE: It's the same set of
17 design basis accidents that is considered in the
18 safety analysis area.

19 JUDGE TRIKOUROS: Right, yeah.

20 WITNESS RAMSDALE: The only difference
21 between the environmental analysis and the safety
22 analysis for those accidents is in the atmospheric
23 dispersion factors used.

24 JUDGE TRIKOUROS: Right. Okay. Now, I
25 think we're going to get into this in the

1 radiological, but I'll ask it now, but I don't expect
2 an answer now. We can talk.

3 I'm very curious to see if the source term
4 was specific to the plant or if it was sort of a
5 generic bounding source term for each of the design
6 basis accidents. So I don't expect an answer now, but
7 (pause).

8 WITNESS RAMSDALE: I checked the source
9 terms that were provided by the Applicant against the
10 source terms generated during the design process.
11 They are specific to the reactors for which the
12 analyses were conducted.

13 JUDGE TRIKOUROS: Right, and I want to get
14 into each and every one. So let's not do that now.

15 WITNESS RAMSDALE: Okay. We also looked
16 at the LOCA for the HR-700, and that was, as I
17 understand it, based on the vendor's numbers, and I
18 had no way of checking those.

19 The several accident analyses were
20 conducted using the MCCS II computer code generated
21 and maintained at Sandia National Laboratory. It's a
22 standard code. There is a parameter in that code
23 which allows you to adjust the power level of the
24 reactors. The parameter was used to adjust the power
25 level of the ABWR reactor to 4,300 for that analysis.

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1 The initial analyses were conducted by the
2 Applicant. We took their decks, input decks. We
3 looked at the input decks, verified that the values
4 that they used for input parameters were appropriate,
5 acceptable to the staff, and we ran the code using the
6 same code, using our version of the code from Sandia.

7 JUDGE TRIKOUROS: Are we going to get into
8 some details of that in Part I?

9 WITNESS RAMSDALE: Yes.

10 JUDGE TRIKOUROS: Okay. So let's put that
11 off, too.

12 WITNESS RAMSDALE: Right. The spent fuel
13 analysis, transportation analysis -- and it includes
14 both normal transportation of spent fuel and spent
15 fuel transportation accidents was based on a 4,300
16 megawatt ABWR and a 3,400 megawatt AP-1000. We did
17 the calculation using both of those reactor source
18 terms.

19 Next.

20 To illustrate the fact that design is
21 important, if you look at the ABWR reactor, 4,005
22 megawatts thermal, which is two percent above the
23 power level as it is routinely done for design basis
24 accident calculations, you will note that the
25 exclusion area boundary dose is about six times ten to

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1 the minus three sieverts. The AP-1000, which is
2 somewhat less than 3,500 megawatt thermal power, has
3 a dose that is about a factor of eight higher.

4 Clearly, in this case the design is
5 significantly more important than the power level.
6 You can't just go from one reactor to another based on
7 power level. That's the point here.

8 If you go to the LPZ dose, you'll notice
9 that things are reversed because the design basis
10 accident calculations account for a time related term
11 in terms of when things are released.

12 JUDGE TRIKOUROS: And the methodology was
13 different, right? When a --

14 WITNESS RAMSDALE: The methodology is
15 precisely the same as the safety methodology. The
16 only difference is that we use atmospheric dispersion
17 factors which are median values for the site rather
18 than values which are exceeded, which give you doses
19 that are exceeded no more than five percent of the
20 time.

21 JUDGE TRIKOUROS: So the source term for
22 the ABWR wasn't TID source term versus --

23 WITNESS RAMSDALE: There is also that
24 difference. The ABWR is a TID source term. It's
25 limited only to iodines, cryptons, and xenons. The

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1 AP-1000 source term also has a total of about 65
2 radionuclides in it.

3 JUDGE TRIKOUROS: And the timing is
4 different, too, I believe.

5 WITNESS RAMSDALE: The timing is clearly
6 different because there is a different variety of
7 reactors, and the AP-1000 has a time release from
8 core. The ABWR, everything is released from core at
9 the initiation of the accident.

10 Next slide.

11 JUDGE WARDWELL: I may have asked this
12 before, but you've reminded me of a question I've had,
13 and I'll ask it again, and it may be more appropriate
14 for Mr. Harvey to answer this. But those dispersion
15 factors or site characteristics, would you anticipate
16 those to change at the COL stage?

17 WITNESS RAMSDALE: Not significantly.
18 There is a year-to-year variation of a few percent.
19 We aren't in general dealing with reactor designs that
20 are within a few percent of regulatory limits.

21 JUDGE WARDWELL: Thank you.

22 WITNESS RAMSDALE: Now, if we talk a
23 little bit about the heat rejection impacts, in the
24 EIS analysis, the water use impacts were unresolved,
25 but it was not for the thermal data that were

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1 available. We did a limited analysis based on a
2 maximum flow rate. This is intake flow rate of 85,000
3 gallons per minute.

4 The PPE intake flow rate is 78,000 gallons
5 per minute. The difference between the two is Unit 1
6 intake, potential impact intake for Unit 1.

7 The water quality impacts are based on a
8 make-up water discharge flow of 52,900 gallons per
9 minute at 100 degrees Fahrenheit. PPE values are
10 39,000 gallons per minute at 100 degrees Fahrenheit.

11 So in our analysis, we have included the
12 PPE values plus values for the existing unit.

13 The aquatic impacts were determined to be
14 small because, first, we have a cooling tower to
15 reject most of the heat, and the plume that resulted
16 from our modeling effort was small, very small,
17 compared to the size of the river. Therefore, even
18 considering the maximum flow and maximum heat
19 rejection, we considered the issue to be closed with
20 a small level of significance.

21 In conclusion, staff believes that the
22 reactor maximum power and normal heat sink PPE values
23 are internally consistent. The staff analysis is
24 generally based on maximum values for the parameters
25 related to reactor power, and therefore, the staff

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1 analysis supports the maximum power.

2 JUDGE TRIKOUROS: So we can derive comfort
3 in knowing that you've looked at all of the PP
4 parameters and have concluded that (a) they're not
5 unreasonable.

6 WITNESS RAMSDALE: That's right.

7 JUDGE TRIKOUROS: And (b) that they
8 support the power level requested for the ESP
9 application.

10 WITNESS RAMSDALE: That's right.

11 JUDGE TRIKOUROS: Both the single unit and
12 the site total.

13 WITNESS RAMSDALE: If you make a guess, an
14 inference of plant efficiency based on the maximum
15 thermal power and the heat rejection, the plant
16 efficiency with this combination number, this is about
17 28 percent, not out of the range of reasonable values.

18 JUDGE TRIKOUROS: Which is conservative
19 actually.

20 WITNESS RAMSDALE: Right.

21 JUDGE TRIKOUROS: Okay. That's good.

22 Thank you.

23 JUDGE McDADE: Anything further?

24 JUDGE WARDWELL: Yes, I have a couple of
25 specific questions. In regards to the staff prefiled

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1 testimony, Answer 4, page 4 and 5, and likewise Answer
2 6 on page 10, there was some curious wording, and I
3 just wanted to make sure there was nothing significant
4 about that or if there was, I understood the
5 significance of it.

6 But the phrases that were used were "not
7 inconsistent," certain things were not inconsistent,
8 for instance, the site power level are not
9 inconsistent with the maximum site reactor power
10 requested by the applicant.

11 Would there be any difference if the words
12 were changed to just "consistent"?

13 WITNESS RAMSDALE: It depends on whether
14 you would want to reject the hypothesis that they are
15 consistent and try to defend that or to reject the
16 hypothesis or accept the hypothesis. It just depends
17 on which way you're going, where your starting point
18 is.

19 JUDGE WARDWELL: But in a practical
20 matter, I understand what you're saying in regards to
21 the application of hypotheses and statistical
22 analyses.

23 WITNESS RAMSDALE: It kind of follows from
24 wording that has been in environmental impact
25 statements related to it's not unreasonable sort of

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1 language.

2 JUDGE WARDWELL: I wanted to make sure
3 that's all it was.

4 WITNESS RAMSDALE: That's all it is.

5 JUDGE WARDWELL: I have no problem with
6 that language. I just wanted to make sure there was
7 no other --

8 WITNESS RAMSDALE: That's all it is.

9 JUDGE WARDWELL: -- associated with that
10 because I think the same thing with the "reasonable"
11 and "not unreasonable."

12 WITNESS RAMSDALE: Yes.

13 JUDGE WARDWELL: I just wanted to make
14 sure that was.

15 JUDGE McDADE: But given the nature of
16 your analysis, you would be able to say that these
17 values are consistent with the applicant's proposed
18 maximum site reactor power?

19 WITNESS RAMSDALE: I did a very coarse,
20 back-of-the-envelope type analysis, not taking into
21 account a lot of things. I assumed a constant heat
22 capacity for water. I assumed one temperature to
23 calculate heat of vaporization and so forth. It
24 wasn't a precise calculation. It was just one to see
25 if the combination of values passes the lab test.

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1 JUDGE TRIKOUROS: Well, at C sub P these
2 conditions should.

3 WITNESS RAMSDALE: Right, right.

4 JUDGE McDADE: Okay. Well, let's follow
5 up on that a little bit. You know, one does a
6 particular analysis using certain assumptions, and
7 then one can make based on professional experience
8 reasonable assumptions based on that analysis. Given
9 those assumptions based on the reasonable analysis, is
10 there anything about these values that give you
11 reservations about this application being granted?

12 WITNESS RAMSDALE: No, sir.

13 JUDGE McDADE: Okay, and can you just very
14 briefly explain why, as opposed to the language I just
15 used, using somewhat more technical language that you
16 would use as opposed to what I said?

17 Why do you feel confident?

18 WITNESS RAMSDALE: The thermal efficiency
19 of a nuclear power plant in I won't say my experience,
20 but has -- I have already considered it to be of the
21 order of 30 percent. I'm willing to accept plus or
22 minus five percent and still not feel uncomfortable.

23 JUDGE McDADE: Okay. So when you say
24 that, it means it could be 35; it could be 25.

25 WITNESS RAMSDALE: Somewhere in that range

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1 would not give me pause that there was a major mistake
2 in the calculation.

3 JUDGE McDADE: And if it were 25 or 35
4 here, it would cause on problems in your judgment.

5 WITNESS RAMSDALE: That's right. That's
6 correct.

7 JUDGE McDADE: And in your judgment, it
8 would be extremely unlikely that it would go outside
9 of that range?

10 WITNESS RAMSDALE: For an existing nuclear
11 power plant, yes. In my judgment, that's true. I
12 have not looked at the advanced designs to be able to
13 make fine distinctions as to whether an advanced
14 design would have more or less, higher or lower
15 efficiency.

16 My guess is it should be higher, but I'm
17 not -- have not looked in that area.

18 JUDGE McDADE: Okay.

19 JUDGE WARDWELL: One last question. On
20 Answer 5 on page 9, and I refer also to the footnote
21 dealing with the first full sentence on the first
22 paragraph, where that first sentence says, "More
23 generally, for environmental review under NEPA, in
24 Part 51 the staff evaluates the reasonably foreseeable
25 impacts. In addition, the staff has the latitude if

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1 numerical data are not available to qualitatively
2 evaluate the impacts. And that's the sentence I want
3 to focus on then.

4 You are making the statement that the
5 staff has the latitude if numerical data are not
6 available to qualitatively impact, to qualitatively
7 evaluate the impacts.

8 The footnote goes on to quote the
9 regulation that is used to generate that particular
10 statement. Looking at what the regulation says, and
11 I didn't check to make sure that was quoted, but I
12 assume it was quoted correctly, that the second
13 sentence in that quote in Footnote 1 on page 9 says,
14 "To the extent that there are important qualitative
15 considerations or factors that cannot be quantified,
16 these considerations or factors will be discussed in
17 qualitative terms."

18 I don't judge -- I won't say that. Strike
19 that.

20 How do you derive the statement that if
21 numerical data is not available, the staff has the
22 latitude to qualitatively evaluate impacts from the
23 regulation that says if qualitative considerations
24 cannot be quantified, then you have the latitude to do
25 qualitative terms?

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1 WITNESS WILSON: Jim Wilson for the staff.

2 There were a number of issues that were
3 identified in the staff's EIS that were not included
4 in the parameter envelope, particularly impacts on
5 resources, aquatic-terrestrial resources, and some the
6 socioeconomic issues. In the absence of quantitative
7 information, we made qualitative judgments to reach
8 our qualitative assessment of small, moderate or large
9 impact depending on the resource that we were
10 evaluating.

11 For the radiological analysis, we had
12 numbers from the PPE that we could do a quantitative
13 analysis. We're talking generally here about things
14 outside of the radiological environmental analysis,
15 the other parts of the EIS.

16 JUDGE WARDWELL: Thank you.

17 JUDGE McDADE: Let me address a question
18 to the Applicant specifically with regard to thermal
19 efficiency. Is it your view that the range of thermal
20 efficiency was estimated to be approximately 30
21 percent plus or minus five, somewhere between 25 or
22 35?

23 Do you agree with that as a starting
24 point?

25 WITNESS CESARE: Your Honor, we did not

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1 make a determination of thermal efficiencies for these
2 plants. We requested the data from the vendors, and
3 comparatively tabulated and determined bounding
4 values. So maybe you could ask your question again.
5 I'm not getting to what you want.

6 JUDGE McDADE: Okay. Specifically, the
7 staff response presumed a thermal efficiency of
8 approximately 30 percent; also indicated that he was
9 familiar with the older reactors, wasn't aware of the
10 thermal efficiency on the new reactors. Can you shed
11 any specific light here on the thermal efficiency of
12 the ABWR or the AP-1000? Do you have that information
13 readily available?

14 (Pause in proceedings.)

15 WITNESS CESARE: John Cesare with the
16 Applicant.

17 Firstly, we assume that we're talking
18 about efficiencies for the light water reactors, not
19 high temperature gas, which is much higher efficiency.
20 We would like to give that some thought if you make
21 just first principal looks at the electrical output
22 versus the thermal output. They're in the area of 33
23 percent, but I'd like to look at that some more and
24 look at our data and get back to you, if we could do
25 that tomorrow.

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1 JUDGE McDADE: That would be fine, and
2 just sort of the assumption. It was my understanding
3 that what was presented to us by you all was an
4 estimated efficiency of about 33 percent. The staff
5 witness indicated, I think, that he was not familiar
6 with the proposed reactors but said basically his
7 understanding based on his experience with older
8 models, that that was a realistic number. That's
9 something he would expect it to be, but that he wasn't
10 familiar with the thermal efficiency specifically of
11 the new reactors.

12 And I was just trying to confirm through
13 you all that I'm correct that the presumed thermal
14 efficiency of these new designs of the light water
15 reactors that you are considering is in that range,
16 about 33 percent.

17 Am I correct there?

18 WITNESS CESARE: I understand the
19 question, and I believe we need to look at that, but
20 that would probably be true. We will get back to you.

21 JUDGE McDADE: Okay. Thank you.

22 JUDGE TRIKOUROS: But we do understand
23 what Dr. Ramsdale or Mr. Ramsdale did, and the fact
24 that he came up with 28 percent is encouraging. He
25 didn't come up with 39 percent or 42 percent. He came

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1 up with under the presumed number of 33 percent.

2 WITNESS RAMSDALE: Your Honor, if you
3 look, my concern was that we were dealing with apples
4 and oranges here. We had a thermal power for one
5 reactor and a normal heat sink power rejection related
6 to something else. You can very easily divide 1,500
7 megawatts by 4,300 megawatts, and you know immediately
8 it's somewhere less than 33 percent for the ABWR
9 thermal efficiency, and I think the limitation is a
10 basic steam cycle limitation, probably not a reactor
11 limitation.

12 JUDGE McDADE: Do you have anything
13 further?

14 JUDGE TRIKOUROS: No.

15 JUDGE McDADE: Do you have anything
16 further?

17 JUDGE WARDWELL: No.

18 JUDGE McDADE: Does the Applicant have
19 anything further by way of clarification of anything
20 that the staff just presented?

21 MS. SUTTON: One clarification, Your
22 Honor.

23 MR. SCHNEIDER: Just a minor this. This
24 is Al Schneider.

25 I believe Mr. Ramsdale said that the 8,500

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1 versus 7,800 flow rate was the difference accounted
2 for the Unit 1 flow rate and that's not correct.
3 Actually the number on the same slide of 52,900 does
4 include the Unit 1 flow rate.

5 JUDGE McDADE: Sorry. Could you say that
6 a little -- I didn't hear you.

7 MR. SCHNEIDER: Slide 16 says --

8 JUDGE McDADE: And this is Slide 16 on
9 Staff Exhibit 17, the heading heat rejection impacts.

10 MR. SCHNEIDER: Right. Mr. Ramsdale said
11 that the difference between 85,000 and 78,000 is the
12 Unit 1 flow rate, and that's not correct. The number
13 below, 52,900, for the discharge flow rate does
14 include the Unit 1 flow rate coupled with the new
15 facility flow rate equals that number.

16 I think that's what you meant.

17 WITNESS RAMSDALE: I will accept that.

18 JUDGE McDADE: Okay.

19 WITNESS RAMSDALE: The difference between
20 85,000 and 78,000 are the other miscellaneous make-up
21 flows.

22 JUDGE TRIKOUROS: We were aware of that,
23 and it was in the application. It was in the
24 responses to questions and answers, et cetera.

25 WITNESS RAMSDALE: Right.

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1 JUDGE McDADE: Okay, and that doesn't
2 change your analysis at all, looking at it. It was
3 just a misspeaking.

4 WITNESS RAMSDALE: I'm not going to change
5 the analysis, no.

6 JUDGE McDADE: Okay. Anything further?

7 MS. SUTTON: We have nothing further.

8 JUDGE McDADE: Okay. Is that the end then
9 for Hearing Issue G from the staff?

10 MR. RUND: The staff has nothing further.

11 JUDGE McDADE: From the Applicant.

12 MS. SUTTON: Nothing further.

13 JUDGE McDADE: Okay. We then raise the
14 issue as to whether to go ahead with Hearing Issue G.
15 It's now quarter of five.

16 PARTICIPANTS: H.

17 JUDGE McDADE: Thank you.

18 I'll work on my alphabet over the weekend.

19 How long before you're set up to go on H?
20 Can we get started in about five minutes?

21 MR. RUND: I think that would be fine for
22 the staff.

23 JUDGE McDADE: And how long do you think
24 the staff's presentation on H will be?

25 MR. RUND: I believe it will be about an

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1 hour.

2 JUDGE McDADE: Okay. We're writing it
3 down, you know.

4 PARTICIPANT: What did you say?

5 JUDGE McDADE: Forty-five minutes to an
6 hour.

7 JUDGE WARDWELL: And I would like to make
8 a comment. Just as we were finishing up here, I
9 quickly looked through the slides of H. We have
10 covered the two last slides already in our previous
11 discussion. I don't think we need to repeat those
12 when we're dealing with the sheer wave velocity and
13 the accidental releases. Permit Condition 2, we've
14 probably beat Permit Condition 2 to death here and
15 certainly don't have to repeat that.

16 I think we've covered lots of issues in
17 this presentation in the course of our questioning
18 yesterday and today. I would encourage the staff to
19 proceed in a conscientious but expeditious manner
20 through the slide presentation because I think it
21 might be quite repetitive and we could proceed right
22 into our questions and be done with this in a very
23 efficient manner.

24 MR. RUND: So is my understanding the
25 Board would like us just to cut what I believe is the

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1 last two slides out of that and we don't even need to
2 bring up --

3 JUDGE WARDWELL: Absolutely.

4 MR. RUND: Okay.

5 JUDGE WARDWELL: Unless there's others --
6 this is my reading of it. We brought those out and
7 put them up as discussion items yesterday. There's
8 nothing new in there that we haven't discussed.
9 Certainly the last two slides can go out, and the other
10 slides, I don't see a lot really new. So I think they
11 can be covered very efficiently is all I'm suggesting
12 so that we do move this along and not reach your
13 estimate, so that you come out as a hero here to
14 night.

15 MR. RUND: My estimates were based on the
16 presentations. They didn't calculate in Board
17 questions.

18 JUDGE McDADE: Okay. We're going to stand
19 in recess, and before we do just let me say I
20 anticipate we're going to try to finish with this
21 hearing issue this evening. I don't know whether
22 anybody has issues, for example with picking up
23 children. Now, if you can make telephone calls if
24 necessary now indicating that you might be here a bit
25 after six o'clock tonight, this would be a good time

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1 to do it, and if there really is some insurmountable
2 problem, to bring that to our attention when we come
3 back from the recess. We're in recess for five
4 minutes.

5 (Whereupon, the foregoing matter went off
6 the record at 4:52 p.m. and went back on
7 the record at 5:01 p.m.)

8 JUDGE McDADE: Is the staff ready?

9 MR. RUND: For the presentation on Hearing
10 Issue H, the staff calls George Wonder, James Wilson,
11 and Andrew Kugler.

12 Andrew Kugler has not been sworn and his
13 qualifications haven't been admitted yet, but we have
14 them here and we proposed to submit them as Exhibit
15 No. 53.

16 JUDGE McDADE: I thought we had already
17 gotten up to 53.

18 Okay. They will be marked as Exhibit 53.
19 There is no objection from the Applicant?

20 MS. SUTTON: No objection.

21 JUDGE McDADE: Okay, and since we haven't
22 seen them at this point, we will ask him to state very
23 briefly his qualifications so that we can accept him
24 as an expert and make a ruling on that, but it will be
25 accepted, the CV, as Staff Exhibit 53 and appended to

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1 the record.

2 (Whereupon, the document referred
3 to was marked as Staff Exhibit
4 No. 53 for identification and
5 were received in evidence.)

6 JUDGE McDADE: Will you please rise?

7 (Whereupon, the witness was duly sworn.)

8 JUDGE McDADE: Please be seated.

9 And would you please state your full name
10 for the record.

11 WITNESS KUGLER: Andrew Joseph Kugler.

12 JUDGE McDADE: And would you give a brief
13 description of your educational and professional
14 background?

15 WITNESS KUGLER: Yes. In terms of
16 education, I have a Bachelor's of Science in
17 mechanical engineering from Cooper Union and a
18 Master's in technical management from Johns Hopkins.

19 In terms of experience, for the last six
20 years I've been senior environmental project manager
21 at the NRC, working initially in license renewal
22 reviews and more recently in new reactor reviews,
23 North Anna and other reviews.

24 I've also been heavily involved in the
25 rulemaking that's currently underway that's nearly

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1 completed. So I've been heavily involved in
2 developing the way the rule will operate for the
3 transmission from an early site permit to a combined
4 license.

5 Prior to that I was a project manager for
6 licensing here at the NRC. I also had seven years at
7 a power plant as a start-up test director and as an
8 engineering supervisor, and prior to that I served in
9 the U.S. Navy.

10 JUDGE McDADE: Okay. Do you have any
11 objection to our receiving expert testimony from this
12 witness?

13 MS. SUTTON: We do not, Your Honor.

14 JUDGE McDADE: He is accepted as a witness
15 and will be allowed to offer opinion testimony as
16 such.

17 Please proceed.

18 WITNESS WONDER: Thank you, Your Honor.

19 George Wonder, project manager for the
20 staff.

21 Ten CFR 52.18 contains the standards for
22 review of applications for early site permits. In
23 order to insure that these standards are met
24 consistently across all technical disciplines, the
25 staff prepared review standard RS-002, processing

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1 applications for early site permits, which draws, in
2 turn, from NUREG 0800, standard review plan for the
3 review of safety analysis reports for nuclear power
4 plants, and from NUREG 1555, standard review plans for
5 environmental reviews for nuclear power plants.

6 Review standard RS-002 is divided into
7 section by technical discipline, for example,
8 hydrology, meteorology, seismology. These technical
9 sections are subdivided into subsections to guide the
10 reviewer. In general, these include a subsection on
11 the areas to be reviewed, basically the scope of the
12 review for any given section, a subsection on the
13 criteria that must be met in order to make a safety
14 determination, a subsection on review procedure, that
15 is, what the reviewer must do in order to determine
16 whether or not the acceptance criteria are met, and a
17 subsection on how to document the review findings.

18 In performing its evaluation, the staff
19 occasionally needs to use outside contractors for
20 their specialized expertise in certain areas. These
21 contractors also follow the guidance of R-002. The
22 contractors submit their evaluations through the
23 cognizant technical branches. These technical
24 branches retain ownership of their sections of the SER
25 and carry the obligation of insuring that the review

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1 standard is met.

2 JUDGE WARDWELL: Were all of the
3 applicable sections followed in this ESP review,
4 recognizing that I'm sure there are sections in 002
5 that just aren't applicable for an ESP at Grand Gulf?
6 Were all of those that were applicable followed?

7 WITNESS WONDER: I'm seeing a head shake
8 over here. So I will --

9 WITNESS WILSON: Jim Wilson for the staff.

10 RS-002 points to the ESRP, NUREG 1555.
11 There's a whole section in NUREG 1555, Section 3,
12 which talks about system design and those kind of
13 things.

14 In the absence of a design, we could not
15 apply --

16 JUDGE WARDWELL: I don't mean those, but
17 I'm saying here's one that does apply to an ESP site
18 and specifically does apply at Grand Gulf also, and
19 did you follow all of those where that was the case?

20 WITNESS WILSON: For the ones that we
21 could follow we did. As I said before, where design
22 information was lacking, we could not follow the ESRP
23 and provide a system description or design
24 description.

25 JUDGE WARDWELL: Right.

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1 WITNESS WILSON: That information is
2 missing from our EIS.

3 JUDGE WARDWELL: Right.

4 JUDGE McDADE: And when you say the ones
5 you could follow, you mean all of those that were
6 applicable.

7 WITNESS WILSON: All of those that were
8 applicable we addressed and documented in our EIS.

9 JUDGE McDADE: Thank you.

10 WITNESS WONDER: The individual technical
11 sections are sent to the project manager as they are
12 completed. The PM is tasked by RS-002 to review these
13 sections for internal consistency, as well as for
14 consistency with the application.

15 After the PM has reviewed all sections and
16 has noted changes as necessary, the entire document is
17 compiled and reviewed by the Division of New Reactor
18 Licensing Management.

19 The document is then sent back to the
20 technical branches and the changes are reviewed to
21 insure that there was no loss of technical accuracy.
22 The PM is further tasked by RS-002 to obtain
23 concurrence of staff counsel to insure that the
24 document is defensible and to insure that there is no
25 legal objection.

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1 Before the SER is finalized, it is
2 presented to the Advisory Committee on Reactor
3 Safeguards for their review and comment.

4 Through the use of detailed guidance in an
5 ongoing review process, as well as final procedural,
6 technical and legal reviews, the staff insures
7 consistency across the entire spectrum of technical
8 disciplines.

9 In conducting its ESP review, the staff
10 insures that the assumptions and commitments on which
11 it relies on making safety decisions in the SER are
12 documented either in the SSAR or permit conditions.
13 Permit conditions are established when, one, the
14 staff's evaluation in the SER rests on an assumption
15 that is not currently supported; when, two, an
16 attribute of the site is not acceptable for the design
17 of systems, structures, or components important to
18 safety; or when, three, the staff's evaluation depends
19 on some future action.

20 In addition to permit conditions, the
21 staff developed a list of COL action items. These are
22 design issues identified by the staff in the course of
23 its review that the staff believes should be addressed
24 by any future applicant referencing the ESP.

25 The COL action items are not an exhaustive

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1 list of additional information to be provided by a
2 future applicant. Rather, they are a subset of that
3 information. Any future applicant must meet the
4 information requirements of 10 CFR Part 52. The COL
5 action items will be a part of the ESP.

6 Staff has developed permit conditions in
7 COL action items. The staff believes that the list of
8 permit conditions is comprehensive because it finds
9 that these are the only conditions necessary to insure
10 that 10 CFR Part 100 is satisfied. The list of COL
11 action items is a subset of the information required
12 at the COL stage. There is no other list of
13 assumptions or commitments.

14 I'd now like to introduce senior
15 environmental project manager for Grand Gulf Jim
16 Wilson.

17 WITNESS WILSON: My name is Jim Wilson.
18 I'm the project manager for the staff's environmental
19 review.

20 I'm going to briefly describe how the
21 staff is going to conduct a CP COL review once an ESP
22 has been issued.

23 The EIS prepare by the NRC staff on an
24 application for an ESP focuses on the environmental
25 effects of construction and operation of a reactor or

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1 reactors that have characteristics that fall within
2 the postulated site parameters. The EIS also includes
3 an evaluation of alternative sites to determine
4 whether there is any obviously superior alternatives
5 site to the site proposed.

6 In its analysis of some issues, the staff
7 relied on reasonable assumptions made by SERI or the
8 staff. These assumptions and their bases are
9 identified in each section of the EIS and are
10 summarized in Appendix J.

11 The NRC is required to independently
12 evaluate and be responsible for the reliability of all
13 information used in the EIS. The NRC staff will
14 verify the continue applicability of these assumptions
15 at the CP or COL stage to determine whether there is
16 new and significant information from that discussed in
17 the EIS.

18 Yesterday and earlier this morning, the
19 Board inquired as to the nature of the ESP permit
20 itself. Part of the staff's problem with providing a
21 draft permit at this time is that we don't yet know
22 what the Board will do. The Board has the authority
23 to impose permit conditions. If the Board chooses to
24 memorialize the key assumptions used by the staff in
25 conducting its environmental review, it could put a

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1 condition in the permit to the effect that an
2 applicant for CP or COL referencing the Grand Gulf ESP
3 must demonstrate that the assumptions contained in
4 appendix J of the FEIS remain applicable.

5 In that case, an applicant would have to
6 address each of the assumptions in Appendix J and
7 demonstrate it had looked for significant new
8 information on each issue. This demonstration would
9 then be required as part of the COL application.

10 Should the Board not put such a permit
11 condition in the ESP, then the burden would fall on
12 the staff to do the demonstration. The staff would
13 likely issue requests for additional information;
14 RAIs, under 10 CFR 5141, which basically says that the
15 NRC may require an applicant to submit such
16 information as may be useful in aiding the NRC in
17 complying with NEPA to enable it to determine whether
18 significant new information existed that would call
19 into question the validity of the staff's assumptions
20 used in the environmental review at the ESP stage.

21 Slide 10.

22 Issuance of a COL is a major federal
23 action, and in accordance with 10 CFR 5120, the NRC
24 must prepare an EIS on that action. If there is no
25 new or significant information on an issue resolved at

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1 the ESP stage, then for the COL EIS, the staff will
2 tier off from the ESP EIS and disclose the NRC
3 conclusion.

4 The staff in the context of a COL
5 application that references an ESP defines new in the
6 phrase "new and significant information" as any
7 information that was not considered in preparing the
8 environmental report included in the ESP application
9 or in the ESP EIS and that was not generally known or
10 publicly available during preparation of the EIS.
11 This new information may include, but is not limited
12 to specific design information that was not contained
13 in the applicant but has changed by the time of the
14 COL application.

15 Such new information may or may not be
16 significant. However, even though an issue may be
17 resolved under 5239 at the ESP stage through the use
18 of the PPE approach, the staff's NEPA analysis as
19 documented in the EIS would disclose additional
20 information once a design is selected.

21 The COL EIS brings forward the
22 Commission's earlier conclusion from the ESP EIS and
23 articulates the activities undertaken by the NRC staff
24 to insure that an issue that was resolved can remain
25 resolved.

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1 If there is new and significant
2 information on a previously resolved issue, then the
3 staff would determine whether such information changes
4 the Commission's earlier conclusion.

5 Environmental matters subject to
6 litigation in a COL proceeding mainly include issues
7 that were not considered or not resolved in the
8 previous proceeding on the site or on the design, and
9 those issues for which there is new and significant
10 information and those issues subject to change or
11 waiver process in 10 CFR Part 52.

12 Slide 11, please.

13 A CP COL or OL application must also
14 demonstrate that the design of the facility falls
15 within the parameters specified in the ESP. Remember
16 the staff included the PPE values used in its
17 analysis, in its environmental analysis in Appendix I
18 of the EIS.

19 In addition, the application should
20 indicate whether the site is in compliance with the
21 terms of the ESP. The information supporting such a
22 conclusion that the site is in compliance with the ESP
23 should be maintained in an auditable form by the
24 Applicant.

25 While the NRC is ultimately responsible

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1 for completing any required NEPA review, for example,
2 to insure that the conclusions for resolved ESP
3 environmental issue remain valid for a COL action, the
4 COL applicant must identify whether it is new and
5 significant information on such an issue.

6 A COL applicant should have a reasonable
7 process to insure that it becomes aware of new and
8 significant information that may have a bearing on the
9 earlier NRC conclusion and should document the results
10 of this process in an auditable form for issues for
11 which the COL applicant does not identify any new and
12 significant information.

13 I'm not sure where that leaves us. I was
14 going to be followed by Tom Cheng and Goutam Bagchi to
15 address the Board's two follow-up inquiries related to
16 this issue. Are we going to go through those two?

17 We're not. Okay. Staff has nothing
18 further.

19 JUDGE McDADE: We will go into questions.

20 JUDGE TRIKOUROS: I have just one
21 question. Regarding the prefiled testimony, page 9,
22 it says that issues were deferred in the Grand Gulf
23 FEIS if the ESP application did not address the issue,
24 e.g., the benefits assessment, or if the issue could
25 not be resolved because, one, the ESP application did

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1 not provide sufficient information, and, two, other
2 information was not then reasonably available to allow
3 the staff to reach a conclusion on impacts.

4 And then it says, and I focus on this
5 statement, "However, the staff was able to resolve or
6 address all environmental issues required for reaching
7 its conclusion with respect to the ESP." So hold that
8 thought.

9 It implies there there are some
10 substantive environmental issues that are required.

11 Second, I think it's page 11 says, "As
12 previously stated, the staff believes that its
13 environmental review of the Grand Gulf ESP application
14 has resolved all matters necessary for the issuance of
15 an ESP."

16 I was trying to identify what matters are
17 necessary. It seemed to me that I couldn't come up
18 with a subset of matters that I would say have to be
19 met. It looked like some things could be deferred to
20 the COL stage or not, depending on the available
21 information. It didn't seem to have an impact on the
22 ESP.

23 Is there some subset of matters that you
24 would need to be able to be resolved in order to reach
25 a conclusion with respect to the ESP, or is that just

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1 -- those are the words, and I took them out of two
2 different places in the testimony.

3 WITNESS WILSON: Jim Wilson for the staff.

4 What the staff is referring to is the
5 scope of issues that are customarily addressed at an
6 EIS. At this stage of an ESP, issues of an ESP, the
7 only matter the staff really needed to decide or
8 address was whether there are any obviously superior
9 alternative sites.

10 Other issues will be addressed later at
11 the COL. Some of those have been deferred from the
12 ESP review.

13 JUDGE TRIKOUROS: So that's it.
14 Alternative sites is the major matter?

15 WITNESS WILSON: The staff prepared an
16 environmental impact statement to inform the decision
17 on the action before the Commission, which is issuance
18 of an ESP. An ESP, in effect, is a partial
19 construction permit.

20 In the case of Grand Gulf, because the
21 Applicant did not submit a site redress plan, we would
22 not be issuing an LWA along with the ESP. Therefore,
23 no ground disturbing activities would occur as a
24 result of issuance of this permit or, you know, the
25 action before the Commission.

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1 In the staff's view, there's a continuum
2 of things that need to be addressed between either at
3 the ESP site or at the COL proceeding before
4 construction activities can begin. The Applicant
5 chose to fall somewhere in the middle of that
6 spectrum, unlike some of the other applicants, like
7 for Vogel where they came in with an actual site
8 design, and they will be able to address more of the
9 issues that we would have to address before
10 construction begins. There were certain things that
11 we could not do based on the application they gave us:

12 Is that responsive to your question?

13 JUDGE TRIKOUROS: Yes, that's fine.

14 JUDGE WARDWELL: To follow up on that,
15 your EIS did resolve other issues besides just the
16 fact that you concluded there were no other obvious
17 superior sites. Those EIS issues that are resolved
18 are, in fact, banked for the COL as long as there's no
19 other new and significant information; is that
20 correct?

21 WITNESS WILSON: That's correct.

22 JUDGE WARDWELL: Thank you.

23 The question I have relates to assumptions
24 and commitments made on the safety side, and I direct
25 you to page 7 of the testimony under Answer 4, the

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1 second paragraph down, where you state, "There are no
2 other lists of commitments or assumptions on which" --
3 I'll wait until we all -- I thought there might be
4 some -- anyhow, I'll start again.

5 Second paragraph down on page 7 says,
6 "There are no other lists of commitments or
7 assumptions on which the staff bases its SER. If a
8 particular assumption commitment or COL stage
9 information need does not rise to the level of a
10 permit condition or a COL action item, the staff
11 determines that no further formal documentation is
12 necessary beyond the discussion or reference in the
13 SER."

14 That says to me that there are a number or
15 some number of assumptions and commitments that were
16 made in the SER that were deemed not to rise to the
17 level of requiring a permit condition, of which there
18 are only three now, or a COL action item. Is there a
19 reason or what was the reason for providing this
20 testimony as it relates to the Board order that came
21 out November 6th that specifically requested such a
22 table to be prepared listing those other ones that
23 don't rise to the level because we have the COL action
24 item? We have that.

25 WITNESS WILSON: That answer is going to

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1 be provided by George Wonder, the safety PM.

2 JUDGE WARDWELL: Sure.

3 WITNESS WONDER: The question is, as I
4 understand it, in regards to the Board's order of
5 November 6th. You requested that we provide you a
6 list of commitments, assumptions, anything on which we
7 based our findings in the SER, and now there appears
8 to be in the testimony a statement that certain things
9 did not rise to the level of being put into a table or
10 list of commitments. This is true.

11 Anything that we require to make the
12 safety decision must be documented either in the SSAR
13 or it is a permanent condition. This refers to things
14 such as you assume, for example, the accuracy and the
15 truthfulness of the application and things like that.
16 No major assumption or no safety finding is based on
17 an assumption that is not document either as a
18 permanent condition or as an S or in the SSAR.

19 Does that answer your question?

20 JUDGE WARDWELL: No, it doesn't, I don't
21 think, and I'd like to focus on the SER as opposed to
22 the SSAR. As I understand it, based on this paragraph
23 and my recollection as I read the SER, that there are
24 a number of commitments and assumptions that were made
25 in your review of the SSAR. Some of those commitments

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1 of assumptions which you talk about in the SER were of
2 such significance that you turned them into a permit
3 condition or a COL action item.

4 There are others that you stated you used
5 in your review but did not end up to rise to the level
6 of a permit condition or a COL action item.

7 The Board asked in its order, "Gee, we
8 would like to have a table of those ones that are
9 still just out there that were the fundament bases,
10 even though they weren't really significant, but at
11 least they were of enough importance that you document
12 them in the SER, and even though they didn't rise to
13 the level of a COL action item or a permit condition."

14 And I was wondering why that wasn't
15 achieved, and the answer may very well be that there's
16 a miscommunication and that, in fact, every assumption
17 and commitment that you talked about in the SER did
18 rise to the level of a COL action item, and, oh, yes,
19 by the way, we had other very fundamental assumptions
20 and commitments like the example you gave. You assume
21 that the application is accurate. Well, I don't think
22 that's stated anywhere in the SER that that was one of
23 your assumptions. Everyone agrees that's going to be
24 one of your assumptions.

25 I'm only talking about the ones you

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1 actually documented in the SER that haven't risen to
2 the level and are reflected in a permit condition or
3 a COL action item, was asked to be put in a table
4 similar to J-1 for on the environmental side so
5 that -- and you can see where we're going with this --
6 it's easier at the COL stage to go to one place and
7 not have to wade through lots of documentation at that
8 point to understand what was the basis for your
9 analyses.

10 WITNESS WONDER: I think I better
11 understand your question now. Thank you, Your Honor.

12 That particular line in the testimony was
13 put in there to be completely thorough and to address
14 things like the truthfulness and accuracy.

15 I was no the PM during the preparation of
16 the SE, but I did discuss this with him in the course.
17 I cannot testify to each individual section, but I
18 believe that there are no such assumptions documented
19 in the SE.

20 JUDGE WARDWELL: That haven't been?

21 WITNESS WONDER: That have not be, right.

22 JUDGE WARDWELL: Reflected in a --

23 WITNESS WONDER: Yes, to the best of my
24 knowledge that is true and correct. I do not believe
25 that you will be able to go through the safety

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1 evaluation and find anywhere in there a technical
2 reviewer saying, "I'm doing this assuming," and this
3 doesn't rise to the level of something that needs a
4 permit condition. I do not believe there are any such
5 things.

6 JUDGE WARDWELL: Thank you for that
7 response. I will just ask one other thing. If, in
8 fact, over the course of the next few days in
9 discussions with staff or other staff members or in
10 reflection upon that as you read the transcript that
11 isn't the case, we just ask that you go ahead and
12 document them in accordance with the order, but it
13 will go ahead with your testimony in saying that there
14 are none and so you can't prepare a table of them.

15 WITNESS WONDER: Absolutely, sir. Yes,
16 sir.

17 JUDGE WARDWELL: I'm done.

18 JUDGE TRIKOUROS: I have just one more
19 quick question that I skipped over from my notes. I'm
20 sorry.

21 This is SERI prefiled testimony, Response
22 A-7. You say in Answer 4 in Exhibit 8, the staff
23 states that COL action items "call for a set of
24 design information to be provided by any further
25 applicant referencing the ESP." It says "emphasis

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1 added."

2 And then you go on to say, "By way of
3 clarification," and I won't read everything, it says,
4 "These items constitute information requirements only
5 and an applicant may depart from or omit COL action
6 items provided that the departure emissions are
7 identified and justified in the FSAR."

8 And I think those are words taken right
9 out of the SER.

10 I guess I'm curious as to what the power
11 of a COL action item is in terms of the latitude that
12 the Applicant has with respect to departing from a COL
13 action item. They perceived it as important enough to
14 mention that specifically in their testimony.

15 How does the staff view departures from
16 COL action items? Is that something that's frowned
17 upon? I know there's been no experience with that
18 yet.

19 WITNESS WONDER: Yes, sir. George Wonder
20 for the staff.

21 As I understand it, and you're right.
22 There's no experience with it, but as I understand it,
23 COL action items need to be addressed, and that is to
24 say that some future applicant can look at a COL
25 action item and say, "This is something that doesn't

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1 need to be done." They simply need to justify that,
2 and that way that item is considered to have been
3 addressed. That is my understanding.

4 JUDGE TRIKOUROS: So that really is all
5 you're looking for with the COL action item. It
6 doesn't have the impact of a permit condition, for
7 example, which as I understand it --

8 WITNESS WONDER: No, no, it doesn't.

9 JUDGE TRIKOUROS: -- is subject to --

10 WITNESS WONDER: No permit conditions is
11 in the permit and you have to do it in order to meet
12 the conditions.

13 JUDGE TRIKOUROS: But you have to do the
14 COL action item before you proceed on as well.

15 WITNESS WONDER: I'm sorry. Could you
16 please repeat that, Your Honor?

17 JUDGE McDADE: Okay. In each instance
18 don't you have to satisfy the COL action item before
19 they proceed on?

20 WITNESS WONDER: You have to address the
21 COL action item. You don't have to satisfy it if you
22 can show that it's something that doesn't need to be
23 done. Do you see what I mean?

24 JUDGE TRIKOUROS: I just wanted to get
25 that clarification. It does say that in the COL

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1 action item list, and I believe the words that SERI
2 used in their prefiled testimony were taken directly
3 from the staff's SER.

4 MS. SUTTON: That's correct, Your Honor.

5 JUDGE TRIKOUROS: So I'm not questioning
6 that.

7 MS. SUTTON: A permit condition for 5224
8 has to be complied with and must be complied with.
9 It's included as part of the permit. A COL action
10 item per Section 8.2 of Appendix A to the FSER
11 indicates, as the staff's witness has said, that COL
12 action items must be addressed, but there may be
13 departures or other ways of addressing them that have
14 to be specified in the FSAR.

15 JUDGE WARDWELL: And there has to be some
16 type of logic of why --

17 MS. SUTTON: Correct.

18 JUDGE WARDWELL: -- that isn't being
19 addressed the way it's stated and either some
20 alternative process or that, in fact, you can
21 demonstrate that what's requested is inapplicable --

22 MS. SUTTON: Correct.

23 JUDGE WARDWELL: -- at this point based on
24 your design or new information.

25 MS. SUTTON: And that would be subject to

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1 staff review, yes.

2 JUDGE WARDWELL: And that really fixes the
3 difference between a permit condition and a COL action
4 item. Otherwise it would be a permit condition.

5 MS. SUTTON: That is absolutely correct.

6 JUDGE WARDWELL: Makes sense.

7 WITNESS CESARE: John Cesare with the
8 Applicant.

9 What I would also add is that this
10 language is exactly analogous to the design cert.
11 rule, certification rule, the appendices to Part 52,
12 which treat the COL action items that are found in the
13 DCD. They are to be addressed, and they must be
14 addressed in the COL.

15 I can't conceive of an example right now
16 of how I would address something, but then do it,
17 approach it in a different way, but it is a COL action
18 item either in the ESP or in the DCD. It must be
19 addressed, discussed in a public way in the
20 application and dealt with, and it is a requirement
21 only at COL. Once it is imbedded and made a condition
22 to the license, it is part of the review at COL.

23 JUDGE McDADE: Okay, and I guess perhaps
24 I'm having some difficulty here on exactly the meaning
25 of the word "addressed" as opposed to "satisfied," and

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1 given the language of, for example, some of the COL
2 action numbers.

3 For example, it will be necessary for the
4 Applicant to evaluate the interaction between the
5 existing meteorological tower and the proposed
6 facility's cooling towers. Now, as I read that, they
7 are going to be required to conduct this evaluation.
8 Once they have conducted that evaluation, there will
9 be additional data available from which the staff can
10 make a determination as to the significance of that
11 data. It may not require anything further and
12 likewise with regard to any potential intervenor at
13 that point in time, they will have that data.

14 But the COL action item requires that that
15 evaluation be done. Am I incorrect there?

16 WITNESS CESARE: We would have to either
17 do exactly what the COL action item says or address
18 some alternative and explain that in the application.

19 JUDGE McDADE: Okay, and when you say the
20 term "address," does that mean that it would be
21 presented to the staff as an alternative to what was
22 written?

23 In other words, stating that this is what
24 was proposed at the ESP stage. Based on the
25 information that was available then, it was viewed

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1 that this would be an appropriate action to take
2 before moving forward. Based on either additional
3 knowledge or additional data, we are proposing
4 something.

5 Now, question. When you use the word
6 "address," as I understand the word "address," that
7 means you have addressed it. The staff may totally
8 disagree with it, you know, and not feel that this has
9 satisfied the COL action item.

10 And as I was understanding this, the staff
11 would then -- you know, you would need not just simply
12 to address it -- of saying, "We no longer think this
13 is necessary," but you would have to satisfy the staff
14 that you have either done what was requested or a
15 satisfactory alternative in the view of the staff. Am
16 I correct there in the Applicant's view or have I
17 overstated that?

18 WITNESS CESARE: I believe you're correct.

19 JUDGE McDADE: Is that the staff's
20 understanding as well?

21 WITNESS WONDER: It is.

22 JUDGE McDADE: Okay. I just want to make
23 sure that I'm not misunderstanding the word "address."
24 To me "address" in the common usage of it doesn't mean
25 very much. It means just sort of, "Yeah, okay."

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1 MS. SUTTON: It would be subject to the
2 staff's review and approval, yes.

3 JUDGE McDADE: Okay, and that's
4 everybody's understanding. So I mean, if we're
5 sitting here and we allow something to go forward as
6 a COL action item as opposed to a permit condition,
7 those are the understandings that it's going forward
8 with from the Applicant's standpoint.

9 WITNESS CESARE: John Cesare for the
10 Applicant.

11 Yes.

12 JUDGE McDADE: Okay.

13 WITNESS WONDER: George Wonder for the
14 staff.

15 Yes.

16 JUDGE McDADE: Okay.

17 JUDGE WARDWELL: And just to beat it to
18 death, to continue with Judge McDade's example, for
19 instance, at the COL stage, you may not have a cooling
20 tower for this plant. Therefore, your addressing this
21 would be, "We ain't got no cooling tower, and here's
22 how we're handling that."

23 You may not have to go any further than
24 that, but that's why it isn't a permit condition,
25 because this is a situation that you don't know what

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1 your design would be, but the most logical design
2 being a cooling tower was that you would have a
3 cooling tower and, if so, this is how you would have
4 to address it, and again, you don't necessarily have
5 to address it that way either, but in the simplistic
6 terms, if you didn't have a cooling tower, that would
7 make this action item moot.

8 WITNESS CESARE: John Cesare of the
9 Applicant.

10 That was exactly I was thinking of other
11 possibilities. The word "address" is exactly the
12 language used in the design certification rule. I
13 believe, but the staff would have to talk to this, I
14 believe that "address" in this context being applied
15 to ESP COL action items is being used in the same
16 analogous way.

17 But in a DCD, there are COL action items
18 that are difficult for the COL license applicant to
19 accomplish, such as provide an ASME walk-down stress
20 report. That's a COL action item. You cannot do an
21 ASME walk-down stress report because the plant has not
22 been constructed yet.

23 So the way you would address that is by
24 some type of commitment.

25 JUDGE TRIKOUROS: There's a COL action,

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1 and this is where this thing gets confusing. There's
2 a COL action item in the AP-1000 DCD that says the
3 Applicant shall evaluate a liquid rad waste release
4 accident, perform a liquid rad waste release accident
5 analysis.

6 All right. I have the permit condition
7 two in this application that says I no longer have to
8 do that because of the design requirement. I don't
9 know how that all gets sorted out at the end, but
10 clearly there are going to be problems that have to be
11 dealt with.

12 JUDGE WARDWELL: I would comment on that.
13 I don't think permit condition two says what you just
14 represented it to say.

15 JUDGE TRIKOUROS: Well, that came out in
16 testimony here that liquid rad waste release events do
17 not have to be part of the design basis of the plant.

18 JUDGE McDADE: We can debate that among
19 ourselves without taking up their time.

20 Any further questions, Judge Wardwell?

21 JUDGE WARDWELL: No.

22 JUDGE McDADE: Okay. Does the Applicant
23 have anything further to add on this particular issue?

24 MS. SUTTON: We have nothing further.

25 JUDGE McDADE: Okay, and does the staff

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1 have anything further to add on this particular issue?

2 Any further by the way clarification or additions?

3 WITNESS WILSON: Nothing further, Your
4 Honor.

5 WITNESS WONDER: Nothing further, Your
6 Honor.

7 JUDGE McDADE: Is there a consensus that
8 we're through with Hearing Issue H?

9 JUDGE TRIKOUROS: I'm through.

10 JUDGE McDADE: Okay. We can excuse these
11 witnesses and recess for the evening.

12 MR. RUND: Before we recess, there are the
13 matters in Attachment A and B. Is the Board's plan to
14 move to those immediately after we finish tomorrow
15 or --

16 JUDGE McDADE: Yes.

17 MR. RUND: -- to the extent they haven't
18 already been addressed?

19 JUDGE McDADE: Right.

20 MR. RUND: Thank you.

21 JUDGE McDADE: Okay. Before we recess,
22 are there any administrative matters? As I indicated,
23 we have the sort of three hearing action items which
24 are the updated exhibit list, updated witness list,
25 and information with regard to the review of the

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1 transcript and when that can be accomplished.

2 We have to decide what time we're going to
3 start tomorrow. Are there any other things that we
4 should take up at this point in time?

5 MS. SUTTON: Yes, Your Honor. We have one
6 small matter that we discussed with staff counsel and
7 staff witnesses prior with respect to Hearing Issue E.

8 Mr. Zinke has one small clarification to
9 make with respect to site selection.

10 WITNESS ZINKE: George Zinke with the
11 Applicant.

12 With regard to previous discussion in the
13 context of NRC Staff Exhibit 15, which was Issue E,
14 alternative analysis, and the discussion was occurring
15 at Slide 20, on the second --

16 JUDGE WARDWELL: Could you repeat that?
17 I'm behind the power curve here.

18 JUDGE McDADE: Fifteen, Slide 20.

19 WITNESS ZINKE: Yes, Exhibit 15, Slide 20.

20 And the discussion was occurring at the
21 point of the second bullet, and we wanted to clarify
22 not the bullet, but what was being said around that
23 topic, that the evaluation of the Indian Point where
24 it says it was eliminated, it was eliminated in
25 further evaluation, but it did not fail to meet any

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1 NRC criteria. It was eliminated at that point because
2 it exceeded a regulatory threshold, that the
3 regulation dealing with population density indicates
4 that more evaluation would need to be occurring.

5 So we determined at that point that it was
6 not a preferred site, but not that it was some fatal
7 flaw, that there could not be a plant put on that
8 site.

9 We ultimately determined all seven sites
10 were acceptable, but all seven weren't preferred.

11 JUDGE McDADE: And just because with
12 regard to that site additional analysis would be
13 needed at this point to include it that had not yet
14 been done, you excluded it at this point.

15 WITNESS ZINKE: That is correct.

16 JUDGE McDADE: Okay.

17 WITNESS ZINKE: Thank you.

18 JUDGE McDADE: Thank you.

19 Anything else?

20 MR. RUND: Nothing from the staff.

21 MS. SUTTON: We have nothing further.

22 JUDGE McDADE: Does the staff have an
23 estimate as to the amount of time, just their
24 presentation on Hearing Issue I? I anticipate there's
25 going to be significant questioning with regard to it,

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1 but just on the presentation?

2 MR. RUND: I'd estimate approximately an
3 hour and 15 minutes without questions.

4 JUDGE McDADE: Okay. Would there be a
5 problem if we start again tomorrow at nine o'clock, or
6 does anybody have any other suggestions?

7 MR. RUND: I'd like to revise my earlier
8 answer. It may be, in fact, closer to two hours I'm
9 being signaled.

10 JUDGE McDADE: Okay. That would persuade
11 me to start earlier than nine.

12 (Laughter.)

13 JUDGE WARDWELL: Shall we seat them now?

14 (Laughter.)

15 MR. RUND: We would have no objection, but
16 I think people might want to go get some dinner.

17 We'll start earlier if the Board would
18 like, but nine o'clock is fine.

19 JUDGE McDADE: Okay. If we start at nine
20 o'clock, we should be able to accomplish or to finish
21 up tomorrow with that remaining hearing issue?

22 MR. RUND: Unless the Board has a lot more
23 questions than we anticipate.

24 JUDGE McDADE: We do.

25 (Laughter.)

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1 JUDGE McDADE: From the staff's
2 standpoint, as far as the presentation tomorrow on I,
3 do you anticipate making a specific presentation as
4 opposed to just being available for questions?

5 MS. SUTTON: On behalf of the Applicant,
6 we will be available for questions, but do not
7 anticipate making a presentation.

8 MR. RUND: From the staff, we have some
9 witnesses who if we finish by two they could still
10 catch their flights. So I don't know. I think
11 starting at nine to my calculation, that should get us
12 done by then, but if the Board thinks otherwise based
13 on its questions from Attachment A and B, we would
14 like to start earlier than nine.

15 JUDGE McDADE: I think we should be able
16 to move forward. If there's no further objection,
17 we'll just schedule to start at nine o'clock tomorrow
18 morning.

19 MS. SUTTON: No objection.

20 MR. RUND: No objection from the staff.

21 JUDGE WARDWELL: And I think the option
22 would be that as we approach that, then let's just go
23 right through lunch until we get it done so that those
24 can catch the appropriate flight, if in fact we do get
25 longer than that.

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1 JUDGE McDADE: Okay. We are in recess
2 until nine o'clock tomorrow morning.

3 Thank you. And, again, I want to thank
4 the witnesses for their presentations today. They
5 were very helpful and please convey to the witnesses
6 who have left our thanks for the testimony that they
7 have given and the help that they have provided to the
8 Board.

9 (Whereupon, at 5:47 p.m., the hearing in
10 the above-entitled matter was adjourned, to reconvene
11 at 9:00 a.m., Friday, December 1, 2006.)

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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: Grand Gulf Early Site

Permit Hearing

Docket Number: 52-009-ESP

Location: Rockville, Maryland

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and, thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.



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