

1 DR. STAMATAKOS: Well, we didn't -- I'll
2 preface this by saying we didn't redo the analysis
3 to come up with our own independent assessment
4 hazard. We just checked aspects of it to give us
5 some confidence of what the conservatisms are, and
6 then we provided that additional analysis that's
7 been a discussion much of the testimony in
8 comparison to other curves to help us understand
9 how it might fit in with other curves.

10 But my, I think that some of the source
11 modeling that how seismic sources were modeled in
12 the PSHA by using a member, for example, long fault
13 segments in Skull Valley, larger in mass than
14 perhaps would otherwise be attributed, activity
15 rates, including activity rates even for the west
16 fault which we don't think is an active source, and
17 some activity on the East Cedar Mountain fault
18 despite the speculation only that there's some
19 quaternary motion on that fault, and then probably
20 some of the interpretations of weights of those
21 parameters in the logic tree that went into the
22 PSHA.

23 That's on the source side. There's also
24 some conservatisms that we noted in the ground
25 motion site. Those are discussed in the

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1 consolidated SER and in our 1999 report.

2 So I think it's hard to pin down what
3 one specific parameter might be leading to what we
4 would consider a conservative assessment.
5 Certainly there are a number of specific ones which
6 we would point to and say that the applicant took
7 some worst-case assessments of those parameters
8 when they could structure their PSHA.

9 JUDGE LAM: Dr. McCann?

10 DR. McCANN: I don't have anything to
11 add to the conservatisms in the source
12 characterization other than to say that there were
13 a collected number both on the interpretation side
14 of the work that was done as well as in the
15 eventual numerical choice of parameters, maximum
16 magnitude and activity rates.

17 With regard to ground motion, one of the
18 things that we noted was the interpretation of the
19 soils data and the estimation of site response.
20 It's our judgment that that was also -- that the
21 parameters were conservatively estimated based on
22 the data that was available, and therefore higher
23 site response was predicted.

24 Q. Now, in your consideration of the
25 exception request, of the appropriateness of it,

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1 you considered the common energy standard and the
2 TMI exemption request. Now, I'm sure you're well
3 aware of we are talking about different level of
4 inventory at these two examples relative to what is
5 we are considering here at the PFS site. To be
6 more specific, I see at least a two order magnitude
7 or increase in inventory. With that fact in mind,
8 would you consider a higher acceptance standard for
9 this particular site?

10 DR. McCANN: I think it was discussed
11 Saturday during Dr. Cornell's discussion and also
12 brought out by Staff counsel that the NRC uses a
13 defense in depth approach, and referring to DOE,
14 it's interesting to note there that their choice of
15 a performance goal and their choice of the
16 acceptable probability of exceedance of the design
17 basis is done independent of what inventory of
18 whatever materials are contained in those
19 facilities. It deals only with the performance of
20 the particular structure, system, or component.

21 So in fact you can have very small
22 inventories and certain SSC's would be designed to
23 say PC-3, or very, very large inventories. For
24 example, the DOE site on the Hanford reservation
25 right now that is dealing with the vitrification of

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1 liquid radioactive waste, I don't know the exact
2 volume, but it's, I believe it's millions -- a
3 million or millions of gallons of liquid
4 radioactive waste is a significant volume. And
5 that facility, the vitrification facility is a PC 3
6 facility.

7 So volume per se in the context of the
8 evaluation of both the seismic hazard and the
9 structures is done on an SSC basis, if you will,
10 and does not explicitly address volume and
11 therefore consequences. There are -- my
12 understanding is both in the DOE world as well as
13 with respect to NRC regulations there is another
14 step, another element in the process that addresses
15 say the risk to the public, the consequences which
16 relates to the volume of inventory.

17 So to answer your question, I would say
18 no, that the existence of a hazardous material is
19 the fundamental basis for selecting whether or not
20 a particular SSC is designed to one level or
21 another, and that other defense and depth related
22 standards, if you will, would pull all of the
23 pieces together to eventually determine whether the
24 health and safety of the public is protected.

25 JUDGE LAM: But do you have an opinion

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1 of this analogy, then, if I ask you to design a
2 dam, for example, it would fail, it would flood
3 100,000 acres, you then would have an acceptance
4 standard for the dam failing.

5 The question is another structure if
6 failed would flood ten million acres or a hundred
7 million acres because of the consequence will be
8 perhaps too automatic higher. Would you have the
9 same standard for these two different structures,
10 one structure if fail would come perhaps a hundred
11 thousand acres, and now the structure, its failure
12 would harm two, three order magnitude higher of
13 acreage. Would you impose a similar standard or
14 identical standard? Now, I'm not saying, I'm not
15 saying the increase of inventory would lead to
16 proportionally linear increase in damages. I'm
17 just posing that hypothetical question of should a
18 potentially higher level of consequence require a
19 higher standard?

20 DR. McCANN: Your use of the dam analogy
21 here is a convenient one for me. I'll give you a
22 two-part answer. Current practice in the dam
23 safety area is contrary to your supposition that
24 one might do a different consideration. And I'll
25 use an example. If a dam poses a threat where it

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1 is likely that at least one person will die, and
2 let's for discussion say it is precisely one
3 person, that dam is characterized as high hazard in
4 the United States by state and federal agencies.
5 If that dam for discussion happened to be Grand
6 Coulee which, if it were to fail, would wipe out
7 nuclear facilities as well as a large segment of
8 the population in the northwest as well as the
9 economy all the way to the Pacific Ocean. That dam
10 is also characterized as high hazard, and also has
11 the same design standards for flood and earthquake
12 as that other dam that only poses a threat to one
13 individual and presumably has a lower economic
14 impact. That may seem a little strange, but that
15 is the standard of practice in the United States at
16 both the federal and state level, by and large.

17 I would agree with the idea that there
18 are additional, and taking the Grand Coulee case as
19 an example, significantly additional considerations
20 that would go into managing the risk posed by Grand
21 Coulee. That's not to say, however, that it would
22 necessarily be transferred to, say, the
23 design-basis earthquake ground motion for that
24 facility, that the likelihood of that earthquake
25 and the likelihood of damage to Grand Coulee

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1 arguably could be the same as for this other
2 smaller, less hazardous facility, but that other
3 considerations would come into play to manage the
4 risk posed by Grand Coulee, emergency action plans,
5 warning systems, etc.

6 And then in my opinion, a regulation or
7 a prudent practice would be to have a risk-based
8 characterization of the impact to the public,
9 whether it's economic, public health and safety,
10 etc., that does take all of those things into
11 consideration. And it could well turn out that if
12 the consequences for Grand Coulee were so
13 significant that emergency warning plans, et
14 cetera, could not provide the necessary safety, it
15 might well translate back into some impact on the
16 design. But that has not been the case. That has
17 not been the practice. And it would take, in my
18 opinion, extreme circumstances where the large
19 volume, the large hazard poses extraordinary
20 consequences to the public, whether it's their
21 property or themselves.

22 JUDGE LAM: So Dr. McCann, within the
23 current debate, your dam failure standard somewhat
24 support the theory that it was safe enough for one
25 cask if it's safe enough for 4,000 casks. I mean,

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1 what you've just said.

2 DR. McCANN: As a general practice. But
3 again, in -- if I were king for a day and had the
4 health and safety of the public also in mind, there
5 would be other standards in the defense in depth
6 concept that would look into consequences. And if,
7 for example, the likelihood of having 4,000 casks
8 or one cask failing was essentially nil, then those
9 other issues don't come into play. So it's a
10 complicated risk picture, but as a starting point,
11 to get back to your original question, I would not
12 use the volume, the existence of the volume as a
13 basis for changing the basis for the design of the
14 SSC's at the facility.

15 JUDGE LAM: Thank you, Dr. McCann.

16 Dr. Stamatakos, do you have anything to add?

17 DR. STAMATAKOS: Nothing.

18 JUDGE LAM: Dr. Chen?

19 DR. CHEN: Not much. I only want to say
20 that, although the inventory is significantly
21 different, but they are both dry storage facilities
22 for spent fuel using cask and canister technology,
23 and a similar risk analysis have been done, similar
24 I guess conclusion have been reached for both
25 facilities.

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1 JUDGE LAM: Thank you, ladies and
2 gentlemen. I appreciate your answers.

3 JUDGE FARRAR: Dr. Kline also has some
4 questions.

5 JUDGE KLINE: If you would look at Staff
6 Exhibit R again, please. I notice on this exhibit
7 that there are two lines relating to INEEL, PGA,
8 one apparently generated by Lawrence Livermore and
9 the other by Woodward Clyde. Is that correct?

10 DR. McCANN: That's correct.

11 JUDGE KLINE: Are these, do these two
12 lines represent just the normal statistical
13 variance or uncertainty that two independent
14 estimators would come up with the same --

15 DR. McCANN: I'd have to -- to really
16 nail down the reasons I'd have to go back to the
17 references. There are a couple possibilities.
18 That certainly is one.

19 The other one, which I believe is the
20 more likely, the Lawrence Livermore curve was
21 prepared as part of a Department of Energy effort
22 in which they were considering producing, or
23 building a new production reactor for generating,
24 producing weapons grade materials. And the
25 Woodward Clyde is a different site at the INEEL,

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1 and I do know from looking at some of the studies
2 that have been done for the site that there are
3 site-specific differences within that rather large
4 area. So I believe that's the explanation.

5 JUDGE FARRAR: Just hypothetically, if,
6 say, four or five equally competent, independent
7 investigators were to draw a seismic hazard curve
8 for Skull Valley, would you expect to see variance
9 in curves of the same sort of magnitude we saw at
10 INEEL, or would the curves all fall on top of one
11 another, do you think? How would you characterize
12 the curve or variance that we would see if we had
13 independent investigators?

14 DR. McCANN: It's certainly reasonable
15 to expect that no group of experts would agree. So
16 the curves would not fall on top of one another. I
17 think the best answer for you, and we could
18 certainly provide a reference, since it actually
19 relates to this figure as well, would be the Yucca
20 Mountain hazard analysis. There were I believe six
21 expert teams and seven ground motion experts that
22 contributed. So you have a total of seven times 42
23 quote, unquote, independent estimates of the
24 seismic hazard at Yucca Mountain.

25 The curve that you see here is the

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1 aggregate of those equally weighted, and indeed,
2 they are not the same and they are different. It's
3 probably -- for at least this discussion it's
4 probably fair to say that the difference between
5 the INEEL and Woodward Clyde and Lawrence
6 Livermore, looking at .5 g and looking at just the
7 mean estimates from those 42 combinations, that the
8 variation is maybe of that size. I don't recall.
9 It's been a while since I've looked at it. It
10 might be slightly bigger.

11 JUDGE KLINE: Okay. If we were to look
12 at say the 2,000-year dotted line there and where
13 they intersect the two INEEL lines, would the
14 corresponding PGA's make a practical difference in
15 the design of facilities at INEEL?

16 DR. McCANN: A practical -- if you're
17 asking me, the question would be, would it make a
18 practical difference in terms of the frequency of
19 failure of the facilities designed at those sites
20 using frequency of failure as the metric, if you
21 will. The answer -- the answer is yes, it would
22 make a small difference. I don't believe it would
23 make a substantial difference. The reason I say
24 that is because, assuming for the moment that it's
25 an NRC regulated facility, are the seismic margins

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1 which translate into the risk reductions that are
2 built into NRC requirements are so large that that
3 small difference would not necessarily cause a
4 problem in frequency of failure space, if you will.

5 JUDGE KLINE: So you're saying
6 essentially that the margins, the margins in design
7 of facilities would accommodate this kind of
8 variance and could accommodate?

9 DR. McCANN: Yes. And I would tend to
10 look at it more in terms of yes, it would translate
11 to a difference in, say, design basis peak ground
12 acceleration, but again, using the risk space
13 analogy, what kind of a difference does it make in
14 terms of the likelihood of failure using a DOE
15 performance goal framework. And that difference
16 would be small.

17 JUDGE KLINE: Now, on a different
18 subject, let's go to your testimony at page 31, and
19 I want to ask you some questions about the
20 discussion that went on earlier today. In
21 particular, it has to do again with the coupling
22 between the relative risk estimate on the one hand
23 of the ISFSI and the choice of a 2,000-year return
24 period on the other. And my understanding from
25 your testimony this morning is that there really

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1 isn't an algorithm that conducts these, it's really
2 more subjective. Is that right? That we get a
3 subjective weighing and risk and from that one
4 makes maybe an engineering judgment that the
5 2,000-year return period is right? I mean, I want
6 to know the strength of the connection.

7 DR. McCANN: I understand. I guess I
8 would disagree that it's not subjective.

9 JUDGE KLINE: Oh.

10 DR. McCANN: But is it nailed down in a
11 very tight algorithm? Certainly in NRC space it is
12 not. In DOE space there's probably some debate
13 that goes on site by site, but it's close to being
14 an algorithm. DOE 1020 says we have a particular
15 performance category and this will be the
16 performance goal. And that is a, you know, an
17 appropriate frequency of failure.

18 Given that the design-basis earthquake
19 will have a certain probability of exceedance,
20 that's a pretty tight algorithm. Here in this
21 particular case we don't have that available. What
22 we do have, from the commercial nuclear reactor
23 side, we have a very well-developed developing
24 risk-informed regulatory approach, and it started
25 in part with the Commission's statement that

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1 current reactors are safe, and therefore going to
2 the seismic and other PRA's that have been done for
3 the reactors, one now has a numerical
4 quantification of what safe really is. And in the
5 seismic arena what that said was if they are safe
6 under the old design practices, albeit
7 deterministic, and we know the risk, we can then
8 back calculate, if you will, what the design basis
9 earthquake ought to be. And in effect that's what
10 happened with 1.165. So 1.165 in commercial space
11 is pretty close to an algorithm.

12 Now, in the ISFSI, of course we don't
13 have that yet. But apparently the Staff is working
14 in that direction. But again, from the
15 Commission's statements about the relative hazards,
16 etc., we have qualitative guidance as to what that
17 algorithm ought to be.

18 Q. So one of the contentions in this case
19 is that, while we really shouldn't use a 2,000-year
20 return interval we ought to use ten, and in any
21 event, if the board doesn't like that, it ought to
22 be bigger than two. So suppose the Board were to
23 say, well, we think it ought to be around four.
24 Now, would you roll your eyes to the heavens and
25 say the Board made a great mistake if we did

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1 something like that?

2 DR. McCANN: Of course that's a loaded
3 question. And in its wisdom, the Board probably
4 doesn't make mistakes.

5 JUDGE KLINE: No, I really want to know
6 if there's some kind of objective error that would
7 be involved in that kind of a board conclusion, in
8 your mind.

9 DR. McCANN: I wouldn't -- no, I could
10 not say that it would be an error, no.

11 JUDGE KLINE: I mean, I'm looking here
12 for what might be called decision criteria. Are we
13 then being asked to choose that your judgment is
14 better than their judgment? Is that the kind of
15 thing we're asked to choose between, or is it more
16 objective than that? And if it is, tell us about
17 it.

18 DR. McCANN: I'm not sure I'm in a
19 position to know precisely the issue that you have
20 been asked to decide.

21 JUDGE KLINE: Well, I mean, it's in the
22 contention. One of the contentions says, in any
23 event, the 2,000-year return interval is inadequate
24 and it ought to be bigger than that. And so now we
25 have two contending positions, and the question, is

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1 it just judgment that decides between the two, or
2 is it something objective from first principles,
3 let's say, that decides it?

4 DR. McCANN: There may be multiple views
5 on this. As Dr. Cornell suggested the other day,
6 we want to have a facility that's safe enough,
7 satisfies regulations or gets to a consideration in
8 an exemption is presented. Is it truly objective?
9 At this point in time, no, it's not, in regulatory
10 space. And thus the answer to your question, if we
11 chose 4,000 years, would you be wrong for some
12 objective reason, some reason of science or
13 engineering.

14 And again, I would say no. I think if
15 you went to 10,000 years, I would say yes, you are
16 -- in my opinion I would consider that to be an
17 inappropriate conclusion, because you would be
18 designing an ISFSI for establishing the design
19 basis for this ISFSI to be equivalent to that of
20 nuclear power plants, which I think would be
21 inappropriate.

22 Taking it the other direction, if you
23 said, gee, it ought to be 2,500 years, that's
24 consistent with USGS maps, it's now consistent with
25 DOE, I would say that would probably be the wrong

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1 decision because, as we stated in our testimony,
2 you're trying to split the hairs a little too thin,
3 and we just can't estimate things like that.

4 So I think there's a small ground, if
5 you will, of reasonableness as to what the
6 appropriate design-basis earthquake ought to be.
7 If it were me, and I don't share Dr. Cornell's
8 opinion on this, he said, you don't need to do a
9 PRA to really understand. But all of your
10 questions in particular, the Board, has said, give
11 me something that ties all these things together.

12 JUDGE KLINE: Yeah.

13 DR. McCANN: Because we don't have the
14 experience that we do in nuclear reactors. Even
15 though they are more complex, our richness of
16 technical PRA experience is far greater.

17 I would want to see the same thing,
18 meaning something that ties it together. And in my
19 mind that would be a risk analysis that would put
20 everything in a far greater context. And we have
21 risk ideas in place that allow us to go in that
22 direction for the ISFSIs, but we don't have it
23 explicitly. We apparently have something like that
24 for TMI where that was considered.

25 Where I do agree with Dr. Cornell is

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1 everything we've seen from an engineering side is
2 these things don't tip over, and when they do, they
3 don't break. So that argues for why bother with a
4 risk analysis that looks at dose and consequence
5 because there is none, nothing -- you have a mess
6 to pick up, things to make them upright, but you
7 don't have a public health issue.

8 But I guess I would agree that there's
9 nothing objective that would nail it down to 4,000
10 or 3,500 or 4,200 or 2,000, but I would say that
11 2,000 based on our breadth of experience in the
12 regulatory space of NRC and in DOE space, that
13 2,000 provides a level of safety that's adequate
14 and appropriate for a facility of this type. 4,000
15 gives you more safety, obviously. Is it more for,
16 you know, too much money, thinking of the public's
17 general interest? That's I think where you would
18 argue that yeah, maybe 4,000 is not the way to go.

19 JUDGE KLINE: Okay, I was going to go
20 there next. If the board were to accept a higher
21 number like 4,000, what are the consequences as to
22 design and any other consequences that might flow
23 from that decision?

24 DR. McCANN: I'm probably not in a
25 position other than to say assuming design work is

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1 on the way right now, people are designing things,
2 certainly would mean going back and changing, etc.
3 So there would be that sort of economic schedule
4 impact. But overall, I'm really not in a position
5 to say.

6 JUDGE KLINE: Do you have a feel for
7 whether it's a really big deal or whether it's
8 something can you accommodate with a minor
9 adjustment in regulatory review? Do you have to
10 start all over from scratch?

11 DR. McCANN: I would say not. But I
12 would really hedge on that. The reason I would say
13 not, hypothetically if a design were half done
14 today, if every SSC that was designed just made it
15 to the acceptable stress level or the acceptable
16 displacement, then upping the design basis would
17 indeed put it over. That would be an impact. Do I
18 expect that that's truly the case? In other words,
19 if those SSC's, half of them were designed, is
20 there literally no margin left in allowable design
21 space, I would say no, but it would be the
22 applicant's burden to prove it. So they would be
23 going back and having to do things. So there would
24 be a burden, no doubt, but would they be putting in
25 more steel or something, that would probably be a

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1 component by component issue.

2 JUDGE KLINE: Okay, thank you. That
3 will do it for me.

4 JUDGE FARRAR: There are probably a lot
5 of people in the room who need a break and need
6 lunch. Mr. Turk, how much redirect do you think
7 you have?

8 MR. TURK: Twenty-five minutes.

9 JUDGE FARRAR: Mr. Gaukler?

10 MR. GAUKLER: I don't have any redirect.

11 JUDGE FARRAR: Recross?

12 MR. GAUKLER: I won't have any recross.

13 JUDGE FARRAR: All right. I had hoped
14 we could finish before lunch to make a big switch
15 to the other issue, but I don't think anyone in the
16 room wants to stay around another half hour. It
17 now being one o'clock, so let's take a lunch break.
18 Is an hour sufficient?

19 MR. TURK: Should be.

20 JUDGE FARRAR: All right, then we'll
21 come back at two o'clock.

22 (A recess was taken.)

23 JUDGE FARRAR: All right, when we broke
24 for lunch, we were ready to begin the Staff's
25 redirect.

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1 MR. GAUKLER: Your Honor, we have two
2 very quick questions, if I could.

3 JUDGE FARRAR: Oh, you want to go first?

4 MR. GAUKLER: I'll go first, I think.

5 JUDGE FARRAR: Okay, fine.

6

7

CROSS EXAMINATION

8 BY MR. GAUKLER:

9 Q. Good afternoon. My name is Paul
10 Gaukler, counsel for the Applicant. And the
11 question of a rock, hard rock site came up, or the
12 measuring of the ground motion for a hard rock
13 case. Isn't it fair to say that one purpose for
14 measuring the ground motion was the hard rock
15 foundation is to buy the basis for comparisons
16 without the soils on top, among different sites?

17 DR. STAMATAKOS: That's correct.

18 Q. Dr. McCann, also a quick question for
19 you. You were referring to a seismic PRA. It's
20 true, isn't it, that seismic PRAs have not been
21 licensing requirements for the NRC, generally
22 speaking?

23 DR. McCANN: Generally speaking --

24 MS. CHANCELLOR: Clarification. You
25 mean the PRA for INEEL?

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1 Q. (By Mr. Gaukler) Okay. Go ahead.

2 DR. STAMATAKOS: Generally speaking, I
3 think that's correct, that it is not a licensing
4 requirement.

5 MR. GAUKLER: No further questions.

6 JUDGE FARRAR: When you say not
7 generally speaking, how many cases would that be
8 where it wasn't done?

9 DR. McCANN: Where it was not a
10 licensing requirement?

11 JUDGE FARRAR: Right. In other words,
12 it may not be a licensing requirement, but has that
13 proven true once, twice, 10 times?

14 DR. McCANN: My understanding, and I
15 don't have an inventory for all of the plants, that
16 there was some type of a requirement placed on PG&E
17 with regard to Diablo Canyon, and that a
18 probabilistic risk analysis for the Plant B
19 performed, including a seismic PRA. Where that's
20 precisely fit within the context of their license,
21 I don't know, but that's my understanding. And as
22 far as I know, that's the only one.

23 JUDGE FARRAR: Where it was not?

24 DR. McCANN: Where it was part of some
25 sort of a licensing requirement. Now, subsequent

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1 to that --

2 JUDGE FARRAR: Wait, wait, then the flip
3 side of that is how many, since we got away from
4 deterministic approach, how many has it not been
5 done? In other words, you just said it's been done
6 once, how many has it not been done?

7 DR. McCANN: Are we still in regulatory
8 space or just in general --

9 JUDGE FARRAR: Yeah, that was the
10 question.

11 MR. GAUKLER: The question was to what
12 extent was it a licensing requirement in regulatory
13 space.

14 DR. McCANN: I believe Diablo Canyon is
15 the only one where it has been done and I don't
16 know of any others where it was a licensing
17 requirement. So all of the other operating
18 reactors.

19 Q. (By Mr. Gaukler) All of the other ones
20 were done as the normal evaluation, seismic PRAs
21 were not a licensing requirement, but it was
22 something the plants undertook?

23 DR. McCANN: I think it would be fair to
24 characterize all of the others that have been done,
25 which is a large number, has been done as part of

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1 the IP Triple E program, which was, I believe cast
2 as a request for additional information. And the
3 licensees had the option in the seismic area to
4 perform either a probabilistic risk analysis or a
5 seismic margins analysis, which has many of the
6 same attributes as a seismic PRA. It has a couple
7 of elements that are a little bit different. And
8 all of the licensed plants have done one or the
9 other, as far as I know.

10 MR. TURK: And this is nuclear power
11 plants?

12 DR. McCANN: This is, right, nuclear
13 power plants.

14 JUDGE FARRAR: All right, Mr. Turk, I
15 think you advised us before lunch, you had a little
16 less than a half hour before we could get on with
17 aircraft?

18 MR. TURK: I'm hoping to do that, Your
19 Honor. I will try to be very succinct.

20

21

REDIRECT EXAMINATION

22

BY MR. TURK:

23

Q. First I'd like to direct this question

24

to Dr. Stamatakos.

25

In cross-examination by the State, you

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1 indicated that you had documented your final
2 assumptions. Do you recall that line of
3 questioning?

4 DR. STAMATAKOS: Yes, I do.

5 Q. These are your final assumptions with
6 respect to the slip tendency analysis?

7 DR. STAMATAKOS: That's correct.

8 Q. Did you document those assumptions in
9 your scientific notebook?

10 DR. STAMATAKOS: Yes, they're listed in
11 my scientific notebook, and I also provided screen
12 images of the computer program to show the final
13 values that were input. The slip tendency is shown
14 on the fault surfaces, and there's a stereonet
15 program that shows the distribution of the
16 different slip tendencies for different
17 orientations of fault surfaces.

18 Q. And I've placed before you and before
19 the parties, the Licensing Board members and the
20 court reporter, copies of a document which bears at
21 the top, the label Scientific Notebook 353. The
22 first date entered on the first page is August 1,
23 2000. Do you have a copy of that document in front
24 of you?

25 DR. STAMATAKOS: I have it in front of

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1 me.

2 Q. And is this, in fact, a copy of your
3 scientific notebook?

4 DR. STAMATAKOS: Yes, it is.

5 MR. TURK: Your Honor, I'd like to have
6 this identified or marked for identification as
7 Staff Exhibit JJ.

8 JUDGE FARRAR: All right, we'll have the
9 reporter do that.

10 (EXHIBIT-JJ MARKED.)

11 JUDGE FARRAR: That's been done, so go
12 ahead.

13 Q. (By Mr. Turk) Is the scientific
14 notebook also -- and by the way, when you were
15 talking about the slip tendency analysis, does that
16 appear on pages six to 12 of the scientific
17 notebook; is that correct? Or pages seven to 12?

18 DR. STAMATAKOS: I believe it's seven to
19 12.

20 Q. Okay. Now, also, the first six pages,
21 pages one to six, what does that consist of?

22 DR. STAMATAKOS: That consists of the
23 discussion of how we developed the data that were
24 input into, I believe it's now called Staff Exhibit
25 R.

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1 Q. And those first six pages, are they the
2 same six pages that were referred to and shown to
3 you by counsel for the State earlier today?

4 DR. STAMATAKOS: Yes.

5 Q. The State asked whether you have turned
6 over your final assumptions to the State. And you
7 indicated you had turned those matters over to me?

8 DR. STAMATAKOS: That's correct.

9 Q. Is, in fact, this the matter that you
10 were referring to?

11 DR. STAMATAKOS: That's correct.

12 MR. TURK: Your Honor, I would note this
13 was turned over in full to the State on February 1,
14 2002.

15 MS. CHANCELLOR: Your Honor, I believe I
16 was asking about the sensitivity analysis or the
17 slip tendency, not the basis for the Staff Exhibit
18 R.

19 MR. SILBERG: Could you turn your mike
20 on or move a little closer.

21 MS. CHANCELLOR: I'll turn it on.

22 MR. TURK: We turned over the entire
23 notebook, but we had no reason to turn over parts
24 of it. We gave her what we received.

25 JUDGE FARRAR: I don't understand,

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1 Ms. Chancellor. Was that an objection or --

2 MS. CHANCELLOR: No, Mr. Turk was
3 implying that the information we sought related to
4 the first part of the exhibit. From the
5 examination today, the part that we couldn't find
6 in Dr. Stamatakos's notebook was the sensitivity
7 analysis with respect to the -- with respect to the
8 slip rate. And I just wanted to make that point
9 clear.

10 MR. TURK: I don't know if there was an
11 objection to it or not, but we did turn over the
12 entire notebook.

13 JUDGE FARRAR: We may be getting ahead
14 of ourselves. I thought he was only saying that
15 this was something that had been previously
16 supplied, for whatever it's worth?

17 MR. TURK: Yes.

18 MS. CHANCELLOR: That's correct.

19 JUDGE FARRAR: Okay.

20 MR. TURK: Your Honor, I would like to
21 offer this exhibit into evidence. I have more
22 questioning I can do with respect to references.
23 If that's a concern of the State, I can do that
24 now. If not, I would simply offer it into evidence
25 at this time.

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1 MS. CHANCELLOR: Your Honor, I'd object
2 to this exhibit going in by itself. If it's going
3 to go in, I think it should be appended to Staff's
4 Exhibit R.

5 MR. TURK: Your Honor, I don't have a
6 problem if somebody wants to append it. I think
7 Exhibit R has already been admitted. It's a
8 separate document. I have no problem if the record
9 reflects it's related.

10 JUDGE FARRAR: Exhibit R has not been
11 admitted.

12 MR. TURK: I'm sorry.

13 JUDGE FARRAR: But now R is in this
14 document.

15 MS. CHANCELLOR: That's correct.

16 MR. TURK: R is pictured in this
17 document on Page 5.

18 MS. CHANCELLOR: I object to Page 5.

19 JUDGE FARRAR: Wait. You can't because
20 you just said R could come in.

21 MS. CHANCELLOR: I didn't say R could
22 come in.

23 JUDGE FARRAR: I thought you said if the
24 notebook comes in, R should come in.

25 MS. CHANCELLOR: Oh, no, no, no, no. If

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1 R comes in, the notebook should come in with it.
2 And I object to Staff's Exhibit JJ to the extent
3 that it has the comparison of the Western U.S.
4 Desert as part -- still without a Y axis label.

5 MR. TURK: Why don't we improve the
6 document a little bit through cross-examination
7 first.

8 Q. (By Mr. Turk) Dr. Stamatakos, I'd ask
9 you to turn to Page 5 of this proposed Exhibit JJ
10 for the Staff. Would you indicate what is the
11 proper label for the Y axis that appears there and
12 in Staff Exhibit R?

13 DR. STAMATAKOS: I apologize, it got
14 chopped off. It should be frequency of exceedance.

15 Q. And while we're talking about this, Your
16 Honor, I'd ask Dr. McCann a few questions.
17 Dr. McCann, Dr. Stamatakos has indicated that you
18 provided data to him with respect to what appears
19 in this chart. Could you explain what data you
20 provided to Dr. Stamatakos?

21 DR. McCANN: The data we provided --

22 Q. Oh, I'm sorry, just for clarification
23 before you answer that. Dr. Stamatakos, you
24 indicated that the Y axis should say frequency of
25 exceedance. More correctly, would it say mean

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1 annual probability of exceedance?

2 DR. STAMATAKOS: Mean annual probability
3 of exceedance is -- I would say frequency of
4 exceedance per year I think would be the most
5 correct way.

6 Q. Thank you.

7 I'm sorry, Dr. McCann?

8 DR. McCANN: The data that we provided
9 was data that we had gathered in the course of
10 technical evaluations that were being done in
11 support of work that the Electric Power Research
12 Institute was carrying out and sharing with the
13 Staff in its technical assessment and development
14 of Regulatory Guide 1.165. At that time, the
15 information that was readily available were the
16 Livermore and EPRI Central and Eastern United
17 States, seismic hazard results for the operating
18 plants in the eastern -- Central and Eastern U.S..
19 There was a shortage of seismic hazard results for
20 sites of any kind in the Western United States
21 where a reasonably comprehensive probabilistic
22 seismic hazard analysis had been done.

23 In the course of that work, we contacted
24 individuals who we knew were involved in various
25 studies, looked at references we had on our own

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1 shelves and got either copies of hazard results,
2 say, for example, the Lawrence Livermore INEEL
3 seismic hazard results, had gotten copies of the
4 hazard curves for those sites. And at the time, we
5 did not get a complete reference for each and every
6 one of the western sites that were presented to the
7 Staff during the 1.165 deliberations.

8 Q. Go ahead.

9 DR. McCANN: I was going to say, those
10 hazards curves and the various analyses that were
11 performed were presented to the Staff in the form
12 of presentations and reports, et cetera. And they
13 are referenced in part in various references in
14 1.165. And the product of those assessments are
15 the various references to the application of 1.165
16 to nuclear power plant sites in the Western United
17 States.

18 Q. You indicated that you were doing work
19 with respect to this issue. Were you doing that
20 work on behalf of EPRI?

21 DR. McCANN: Yes, we were working for
22 EPRI who was working with -- there was a name
23 change in the middle, but it's now known as the
24 Nuclear Energy Institute in Washington.

25 Q. And what was the time frame in which you

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1 were doing that work?

2 DR. McCANN: That work was done
3 approximately 1993, '94.

4 Q. And it was all prior to the publication
5 of Reg Guide 1.165?

6 DR. McCANN: Yes.

7 Q. And do you recall offhand approximately
8 when that regulatory guide was issued? Would it be
9 sometime in '97?

10 DR. McCANN: March 1997.

11 Q. And that is before the PFS application
12 was ever submitted to the NRC; correct?

13 DR. McCANN: I think so. I don't know
14 the exact month of the PFS application.

15 Q. And to your knowledge, were these hazard
16 curves on the data that went into them, did that
17 form a part of the Staff's and the Commission's
18 database in issuing regulatory guide 1.165?

19 DR. McCANN: Yes, that's my
20 understanding. There are references to what -- the
21 recognition that there are differences between the
22 Central and Eastern U.S. and the Western U.S.
23 hazard results, and in particular in Appendix B to
24 Regulatory Guide 1.165, there is direct reference
25 to the fact that the reference probability, which

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1 is determined in 1.165 should be used in
2 conjunction with sites in the Central and Eastern
3 United States, where Lawrence Livermore or EPRI
4 data are not available. And then the guide goes on
5 to say that the final SSC -- however, the final SSC
6 had a higher reference probability, may be more
7 appropriate and acceptable for some sites
8 considering the slope characteristics of the site
9 hazard curves. And there's a footnote that the
10 Staff would review another number for the reference
11 probability on a case-by-case basis. And these
12 western hazard curves with their steeper slopes is
13 what's being referred to.

14 Q. And this is in Appendix B to Reg Guide
15 1.165?

16 DR. McCANN: Yes, what I just read,
17 correct.

18 Q. If you were asked to provide more
19 specific identification of the references, is that
20 information available to you back in your office?

21 DR. McCANN: Yes.

22 MR. TURK: Your Honor, may I address the
23 State's motion with respect to Exhibit R and JJ, to
24 the extent that they include it? The State's
25 principal objections to the introduction of Exhibit

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1 R, had to do with the lack of specification of the
2 references as well as the lack of an identification
3 of the Y axis. I think we've now verified both.
4 With respect to the Y axis, the title has been
5 given. With respect to references, it's clear
6 first of all that this is information that has been
7 incorporated into RG 1.165, and that if the State
8 needs specific references, we can provide that
9 later. But I think that we've established that the
10 data is reliable and has been utilized by the Staff
11 in developing regulatory guidance.

12 JUDGE FARRAR: Ms. Chancellor?

13 MS. CHANCELLOR: A couple of things,
14 Your Honor. Certainly from the exhibit, the data
15 are not reproducible from the references there. In
16 addition, Dr. McCann stated that it went into some
17 database for the NRC for 1.165. And I don't know
18 whether for the Western U.S., San Francisco Bay
19 Bridge, for example, Los Alamos site and INEEL,
20 whether that's part of the database or whether what
21 went into their database is from the Yucca Mountain
22 topical report that refers to the five nuclear
23 power plants in the west that we went over with
24 Dr. Cornell.

25 The lack of reference and lack of being

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1 able to reproduce the data is only one leg of the
2 State's objection. The overriding --

3 JUDGE FARRAR: Let me interrupt you
4 there. I'm not sure what you mean by lack of
5 ability to reproduce it. I mean he said, I think
6 where he got it from and they drew the graph.
7 What's wrong with that? Maybe I'm missing
8 something.

9 MS. CHANCELLOR: I can't go to the San
10 Francisco Bay Bridge, Geomatrix PSHA prepared by
11 the California Department of Transportation because
12 it is an incomplete reference. The same with Los
13 Alamos site one, Canford site A, INEEL, Lawrence
14 Livermore Lab, date unknown, INEEL one, Woodward
15 Clyde --

16 JUDGE FARRAR: Oh, you're saying that if
17 you just took the scientific notebook and said,
18 okay, I'm going to go check this, you wouldn't be
19 able to find the document to check it out?

20 MS. CHANCELLOR: Right, he's asking us
21 to accept it on face value and I'm saying there's
22 no way with these references that we can go and
23 verify whether the plots on Page 5 of the notebook
24 are accurate. That's our first -- that's the first
25 leg of our objection.

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1 JUDGE FARRAR: Let me hear from the
2 Staff. So I can keep all these straight, let me
3 hear from the Staff on that.

4 MS. CHANCELLOR: Okay.

5 MR. TURK: Two points, Your Honor. No.
6 1, Ms. Chancellor repeatedly asked Dr. Stamatakos
7 where the information came from. He wanted on
8 several occasions to refer to Dr. McCann. She
9 declined to take that invitation. There are at
10 least three times when he said Dr. McCann could
11 give you the information, and she did not ask for
12 it. Now, I don't know whether he can give the
13 specifics that she's now interested in obtaining,
14 but we've indicated that he could get more specific
15 information from the office. And if she wants to
16 pursue a line of questioning now, I don't have a
17 problem with her doing that, if that's how she
18 feels she wants to use the time available.

19 JUDGE FARRAR: Mr. Gaukler.

20 MR. GAUKLER: Also, I would say that the
21 question of admissibility is not necessarily -- you
22 don't have to have your facts and data to be
23 admissible. Facts can rely on cities and reports.
24 The question is whether or not they can probe in
25 cross-examination. No. 1, Ms. Chancellor can probe

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1 in cross-examination. No. 2, if I understand the
2 offer of the Staff correctly, they were willing to
3 make available more information on the background
4 of the data so that she can check the reliability.

5 MS. CHANCELLOR: Not during
6 cross-examination, Your Honor. There's no way I
7 can check the reliability of these hazard curves
8 unless our experts can go to the specific reports
9 that the Staff relied upon to derive these curves.

10 And with respect to some database for
11 1.165, I don't know if that database includes some
12 of the -- all of the seven references or whether it
13 only includes some of them. But that's only part
14 of our objection.

15 JUDGE FARRAR: Okay, go ahead with the
16 rest.

17 MS. CHANCELLOR: The rest. The main
18 point of our objection, Your Honor, is that the
19 graph on Page 5 is not being offered to show the
20 hazards at the Skull Valley site, vis-a-vis the
21 other seven sites or however many sites there are
22 here. It is being offered for the assumption that
23 PFS's seismic hazard analysis is conservative. All
24 this graph shows is what are the PGAs for these
25 various sites. It doesn't show that the Skull

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1 Valley site -- that PFS, for example, computation
2 of peak ground accelerations is 1.5 times more
3 conservative than it is for Salt Lake City. It
4 just doesn't show that, and that is what this
5 exhibit is being offered for. If the Staff is
6 willing to --

7 JUDGE FARRAR: But you said before, it
8 could just as well be taken to show how bad things
9 are at Skull Valley, how hazardous things are. And
10 I guess my concern is, we're not a jury. If you
11 put this in front of a jury, they might get
12 confused by it. We've heard a lot of testimony
13 about it, and I would hope by this time, we've
14 convinced people that we -- you know, that we can
15 be trusted to look a document and to make sense out
16 of it.

17 MS. CHANCELLOR: If this goes up to the
18 Commission and the Commission gets this graph and
19 it's tied to the Staff's testimony that says, this
20 is being offered to show how conservative PFS's
21 ground motion figures out, especially vis-a-vis
22 Salt Lake City, then that is, I believe,
23 misleading.

24 JUDGE FARRAR: Well, but I assume it
25 would go up to the Commission as part of a record

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1 that would accompany a decision we would write
2 where we would say what this means, if anything.
3 And if we fail to do our job, you would in your
4 brief to the Commission, tell them what it means
5 and doesn't mean and you'd put your twist on it and
6 the other side would put their twist on it.

7 In other words, to me -- I have not yet
8 consulted with my colleagues -- it shows what it
9 shows. These are plots of different things and we
10 know what each of them stands for. And where does
11 it say in here that it's being offered to show that
12 it's one and a half times more -- okay. It's on
13 the discussion page. Okay, you've cross-examined
14 him on that?

15 MS. CHANCELLOR: Yes, I did.

16 JUDGE FARRAR: Okay. It is what it is,
17 then. In other words, he says the graph represents
18 this, you say it represents something else, that
19 goes to what weight we give a document, not its
20 admissibility, if I am correct. Maybe I'm not.

21 MS. CHANCELLOR: I don't have as much of
22 an objection to Staff Exhibit JJ which comes in
23 with the scientific notebook, as I do to Staff's
24 Exhibit R which is just a piece of paper floating
25 around by itself without any supporting --

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1 JUDGE FARRAR: Okay, Mr. Turk, we got a
2 deal. JJ is in, R is out. Do you buy that? Since
3 R -- it's contained in JJ. Don't make me answer
4 for you like I answered for the witness this
5 morning.

6 MR. TURK: May I consult with the
7 witness for a moment?

8 JUDGE FARRAR: Let me ask the witness.
9 What I see on Page 5 of your notebook is what I see
10 in Exhibit R, the same thing?

11 DR. STAMATAKOS: That's the same thing.

12 JUDGE FARRAR: Simple, okay. JJ is in,
13 R is out.

14 Mr. Silberg, you look anxious to talk.

15 MR. SILBERG: I just want to make sure I
16 understand. R is referenced in the Staff's
17 testimony, and somehow we're going to have to make
18 sure that R not being in evidence is now reflected
19 as JJ.

20 MS. CHANCELLOR: Wrong, Mr. Silberg,
21 they don't refer to an exhibit, they say an exhibit
22 to be named later.

23 MR. TURK: In truth, Your Honor, the
24 testimony that we described on Saturday uses the
25 title of the term, which is comparison of Western

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1 U.S. hazard curves and puts that in quotes. It
2 doesn't say it's a separate exhibit or not.

3 JUDGE FARRAR: And that's on Page 5?

4 MR. TURK: Page 5 of Exhibit JJ.

5 JUDGE FARRAR: Right.

6 MR. TURK: Yes.

7 JUDGE FARRAR: So where your testimony
8 refers to an unlettered exhibit but describes the
9 exhibit, everyone will now know that it's Page 5
10 that is found on Page 5 of Exhibit JJ.

11 Mr. Silberg, does that take care of your concern?

12 MR. SILBERG: As long as the testimony
13 is clear, it doesn't matter to me.

14 JUDGE FARRAR: I think this was a
15 peculiar situation where the testimony did not --
16 because of the timing of the filing, did not refer
17 to a specific lettered exhibit.

18 MR. TURK: Your Honor, inasmuch as the
19 chart is the same, whether it stands alone or as
20 part of the other exhibit, I don't have a basis to
21 object. It's coming into evidence. It's just not
22 going to be a single piece of paper by itself,
23 which I think is the State's primary concern.

24 JUDGE FARRAR: Right. So I think we've
25 solved this problem. Let's move on.

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1 Q. (By Mr. Turk) I'd like to start with
2 other matters at this point. You were asked some
3 questions, Dr. Stamatakos, yesterday concerning a
4 statement of consideration that's discussed in
5 Answer 19 of your testimony. And I believe your
6 testimony in cross-examination was that the
7 Commission, recognizing that rule-making
8 proceeding, that it would be appropriate to do a
9 case-by-case analysis with respect to a
10 probabilistic approach. Have you had an
11 opportunity to look at that testimony again since
12 you gave that answer? This has to do with the 1980
13 rule making.

14 DR. STAMATAKOS: Yeah, the 1980 rule
15 making or the 19 --

16 Q. If you would turn to Answer 19 in your
17 testimony.

18 DR. STAMATAKOS: Okay.

19 Q. On Page 25, there's a paragraph that
20 begins with the word third in adopting the
21 regulations in 10 CFR Part 72?

22 DR. STAMATAKOS: That's correct.

23 Q. And then you quote from a statement
24 consideration that appears on 45 Federal Register
25 74697.

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1 DR. STAMATAKOS: Uh-huh.

2 Q. That was the 1980 rule making for
3 ISFSIs; correct?

4 DR. STAMATAKOS: That's correct.

5 Q. And was the statement that appeared
6 there about doing a case-by-case analysis until
7 more experience is gained, before I thought you had
8 indicated your belief that that was with respect to
9 probabilistic studies. Have you had an opportunity
10 to reconsider that answer? To your knowledge, did
11 the 1980 rule making involve the question of
12 whether problems and approaches should be followed?

13 DR. STAMATAKOS: No.

14 Q. So that was with respect rather to what
15 design level earthquake should be set?

16 MS. CHANCELLOR: Objection, counsel is
17 leading the witness.

18 MR. TURK: Your Honor -- that's fine, I
19 will not lead. But I can't keep to my 25-minute
20 commitment. I'm perfectly prepared to do this the
21 normal way.

22 DR. STAMATAKOS: I believe that what's
23 meant by that statement --

24 JUDGE FARRAR: Wait, wait. We're
25 talking.

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1 (Judges conferred off the record.)
2 JUDGE FARRAR: Ms. Chancellor, we're
3 going to overrule the objection, and maybe this is
4 a time to renew yet again our message that let's
5 just ask the questions in a way that gets the
6 answers on the record in the quickest way possible.
7 I don't know when the Board asks questions, we
8 don't give predicates. Questions may be good, bad
9 or indifferent, but we just ask the questions and
10 we try to get an answer, and whatever the answer
11 is, that's what it is. I know it's different with
12 you all, you're trying -- you know, we're just
13 looking to fill out the record and get the truth.
14 You all are pushing for a particular position. But
15 I think as we move through the rest of this week
16 and try to keep making progress, that the quickest
17 way we can get at things will be the best. So
18 perhaps we'll be more vigorous in enforcing that
19 than we have been.

20 Go ahead, Mr. Turk.

21 Q. (By Mr. Turk) Thank you. Did you have
22 something you wanted to say in response to the last
23 question?

24 DR. STAMATAKOS: Yeah, I would just say
25 that the way I interpret what the Commission said

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1 there was in recognition that ISFSIs that are not
2 massive structures, one such as dry cask and
3 canisters, that they recognized early on the
4 inherent risks of such facilities would be
5 significantly less than nuclear power plants and
6 therefore, the design requirements, what would go
7 into determining the earthquake, should be
8 determined case-by-case until the necessary
9 experience is gained for them to be able to modify
10 the regulation.

11 Q. And that was not with respect to
12 probabilistic versus deterministic analysis;
13 correct?

14 DR. STAMATAKOS: Well, I would assume
15 that the design requirement earthquake could refer
16 to deterministic or probabilistic, but it's more
17 appropriate in probabilistic, since in
18 deterministic, you get what you get.

19 JUDGE FARRAR: Mr. Turk, let me
20 interrupt. Let me add something, Ms. Chancellor,
21 to my previous ruling so you don't think we're
22 being unfair. All the testimony that's prefiled is
23 leading the witness. You all sit down and you work
24 for months and you file prefile testimony. If that
25 isn't leading the witness, I don't know what is.

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1 So I don't know why we can't do it orally, since
2 you do it in writing for hundreds of pages.

3 MS. CHANCELLOR: My point, Your Honor,
4 was that the witness was struggling with the answer
5 to the question. It wasn't per se that he was
6 leading the witness, it was just in that specific
7 instance.

8 JUDGE FARRAR: Oh, okay. Then I
9 misunderstood you, but let's go ahead anyhow.

10 Q. (By Mr. Turk) Dr. McCann, are you
11 familiar with any current Staff plans or proposals
12 to present to the Commission with respect to
13 Western United States nuclear power plant sites, as
14 to whether they should have a higher probability of
15 occurrence or not?

16 DR. McCANN: No, I'm not aware of any
17 plans.

18 Q. Also Dr. McCann, you were asked about
19 the last sentence in your testimony, as to whether
20 or not that sentence, which has to do with
21 applications for renewal of licenses, whether that
22 sentence is surplusage. I'd like to ask you -- and
23 you mentioned in your answer that you didn't -- I'm
24 sorry, that in the event that there was the license
25 renewal application in the future, then possibly

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1 new advances might be taken into consideration. In
2 the event that a license renewal application is
3 received for a facility, is it possible that other
4 matters might be taken into consideration, aside
5 from advances in technology?

6 DR. McCANN: Yes, I would think that
7 the, for example, new seismic hazard information,
8 seismologic, geologic information that became
9 available, would be considered.

10 Q. So that the application for renewal,
11 then, would be based upon the most accurate
12 database available at the time?

13 DR. McCANN: Yes.

14 Q. Dr. Chen, you were asked some questions
15 about the ICPP, the Idaho Chemical Processing
16 Plant, and you indicated that you thought that
17 facility was licensed by the NRC. Is that your
18 understanding or is that more of a speculation?

19 DR. CHEN: That's more of a speculation.

20 Q. You don't know if it's licensed by NRC,
21 do you?

22 DR. CHEN: I don't know.

23 Q. Dr. McCann, there was some point in your
24 testimony earlier today in which I believe you said
25 the PFS site is challenging or more challenging

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1 than other sites. If -- I don't know if you recall
2 that same answer, but could you explain whether you
3 believe this site is more challenging from a
4 seismic perspective than the Diablo Canyon or San
5 Francisco Bay Bridge or Wasatch fault areas?

6 DR. McCANN: Could you refresh my memory
7 when I said more challenging.

8 Q. You were answering some questions with
9 respect to the seismic hazard at the PFS versus
10 other sites, such as Diablo Canyon or the Bay
11 Bridge or Salt Lake City, and I thought I heard you
12 say something like the PFS site is challenging. I
13 understood what you were talking about was the
14 Geomatrix presentation of its estimate of the
15 seismic hazard as compared to other seismic hazard
16 curves.

17 DR. McCANN: As we look at the Geomatrix
18 results, the individual parts of the analysis and
19 the results, we -- as we piece things together,
20 based on our technical evaluation of theirs parts
21 of the analysis, we concluded that there were a
22 number of conservatisms and also a few
23 unconservatisms in the analysis, but in aggregate,
24 that it was our judgment that the assessment of the
25 ground motion hazard at the PFS site was

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1 conservative and therefore, provided an estimate of
2 the likelihood of ground motions at the PFS site
3 that was high relative to what the actual hazard
4 was -- is.

5 Q. Do you believe that the PFS site
6 presents a greater seismic hazard than the San
7 Francisco Bay Bridge, Diablo Canyon or Salt Lake
8 City locations?

9 MS. CHANCELLOR: Objection, no basis
10 for -- no foundation.

11 MR. TURK: This is an open question.
12 It's a proper form direct question. It relates to
13 the cross-examination on which he was asked to
14 compare hazards at different sites.

15 JUDGE FARRAR: I guess what's troubling
16 me is I'm not sure we got a direct answer to the
17 last question which had to do with how challenging
18 it was. And I never heard an answer.

19 MR. TURK: And that's what I'm trying to
20 follow up on.

21 JUDGE FARRAR: You were asked -- now,
22 maybe you don't recall using the word challenging
23 and maybe Mr. Turk is mistaken, you can say you
24 never meant to use that word and it's not
25 challenging. You know, he's going by his

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1 recollection. We're not going to bother the court
2 reporter to go back to this morning's session and
3 find it. Do you consider it particularly
4 challenging?

5 DR. McCANN: It is -- the PFS site is in
6 a seismicly active area, and at certain ground
7 motions, the PFS hazard curve is less than the San
8 Francisco Bay Bridge and Diablo Canyon. And at
9 others, in particular at higher ground motions, the
10 PFS -- the likelihood of higher ground motions is
11 higher than at Diablo Canyon and the Bay Bridge.

12 Q. (By Mr. Turk) According to the
13 Geomatrix analysis?

14 DR. McCANN: According to the Geomatrix
15 analysis.

16 Q. But your view is that that conclusion
17 would be overly conservative?

18 DR. McCANN: We believe -- I and we
19 collectively believe that the Geomatrix
20 characterization of the site hazard is
21 conservative.

22 Q. I don't know if I can get this question
23 out clearly enough. Let me try. There was a
24 question that I noted at the time but I thought you
25 had misunderstood because I didn't think your

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1 answer matched the question posed to you by
2 Ms. Chancellor. And I think she was trying to get
3 you to explain whether it might be possible or in
4 your view was it a fact that one reason why the
5 Geomatrix estimation of seismic hazard at the PFS
6 site being higher than the Salt Lake City seismic
7 hazard might be because the east fault was located
8 close to the PFS site, whereas Salt Lake City might
9 be at a greater distance from the Wasatch fault
10 than the east fault was to the PFS site. I don't
11 think that your answer directly went to that. Do
12 you have -- but I thought you had answered in
13 response to her question yes, and then you went on
14 to give a different kind of explanation. Did you
15 mean by saying yes in response to that question,
16 that you think the location of the east fault
17 vis-a-vis the PFS site, is a reason why the PFS
18 hazard curve calculated by Geomatrix is higher than
19 the Salt Lake City seismic hazard curve?

20 DR. McCANN: No, I did not mean that.

21 Q. And again, this might just be a problem
22 in making the record clear. Dr. Stamatakos, there
23 was a point today when you indicated that the
24 hazard for Skull Valley is still larger than the
25 plots for I-15, and I think you indicated that's --

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1 what you're talking about there is not that the
2 hazard is greater, but that's the way Geomatrix
3 portrays it; correct?

4 DR. STAMATAKOS: That's correct. The
5 calculated ground motion.

6 Q. Also, you mentioned that you had done
7 sensitivity studies, and am I right that those are
8 the slip tendency analyses that you did that are
9 reflected in your scientific notebook?

10 DR. STAMATAKOS: Well, what we did was
11 to -- in the process of tuning the slip tendency to
12 be able to achieve the maximum slip tendency value
13 above .65. So in that process, we varied
14 orientation and magnitudes of the principal
15 stresses. You can see from the plots that are
16 provided now in that diagram, that a 10 degree
17 difference in the orientation of Sigma III is not
18 going to have a large impact on the slip tendency
19 values.

20 Q. Could we turn to your scientific
21 notebook now to make sure we understand it
22 properly. And this is Staff Exhibit JJ. If you
23 would turn to the color page, which is No. 10. Is
24 this the chart related to your sensitivity
25 analysis?

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1 DR. STAMATAKOS: Well, this is a
2 close-up view of the slip tendency for the site
3 area including Stansbury east fault, west cedar
4 mountain fault, and then the diagram on the right
5 is the same map pattern but it's extended in the
6 area that includes sections of the Wasatch fault,
7 and then the insert is a stereonet which shows the
8 orientations of the magnitudes of the principal
9 stresses, Sigma I, Sigma II and Sigma III. That's
10 the final evaluation of those stresses. And then
11 colored in that, this is a stereonet of the lower
12 half of a sphere, if you will, and the color codes
13 are the codes relative to the slip tendency values,
14 and that is shown in the bar graph there. So poles
15 to faults that fall within the reds and yellows
16 have high slip tendency, and the poles to fault
17 planes that fall in the blues and greens have
18 relatively lower slip tendency values.

19 Q. Taking that last comment as our leadoff,
20 if I look at the chart on the left which represents
21 the faults in the vicinity of the PFS site?

22 DR. STAMATAKOS: Yes.

23 Q. The red areas are the areas that have
24 the greatest tendency for slip?

25 DR. STAMATAKOS: The red -- traces of

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1 those fault segments with red have higher slip
2 tendency values than the ones that are yellow and
3 green.

4 Q. And among yellow and green or green and
5 blue have the lowest tendency to slip; correct?

6 DR. STAMATAKOS: That's correct.

7 Q. Now, Geomatrix, however, did not
8 consider those variations; is that correct?

9 DR. STAMATAKOS: No, they did not?

10 Q. They just assumed everything had the
11 same tendency to slip?

12 DR. STAMATAKOS: That's correct?

13 Q. And that would produce a larger overall
14 ground motion effect; correct?

15 DR. STAMATAKOS: If they had
16 incorporated this, my belief is that you would end
17 up with a smaller hazard. It's not a requirement
18 and, you know, our job is not to do the seismic
19 hazard, it's to deem its acceptability, and one way
20 to demonstrate its acceptability is to demonstrate
21 that it's potentially conservative?

22 Q. If you would, take a look at the large
23 chart that appears on the right of this page, and I
24 see there there's a box that's framed in dotted
25 lines. That's the PFS site -- vicinity, I'm sorry?

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1 DR. STAMATAKOS: Yeah, that's the
2 equivalent area that's show in the diagram on the
3 left side of this page.

4 Q. Okay. Now, the way it's depicted in the
5 right side of the chart, is that an actual physical
6 representation of how it appears in nature
7 vis-a-vis the Wasatch fault and other faults in the
8 area?

9 DR. STAMATAKOS: This is the map of
10 fault traces that we digitized from the map that
11 was provided in Geomatrix 1999.

12 Q. And there's one very long squiggly line
13 on the right side that goes almost from the top of
14 the page to the bottom of the page?

15 DR. STAMATAKOS: Yes?

16 Q. Is that the Wasatch fault?

17 DR. STAMATAKOS: That's primarily the
18 Wasatch fault?

19 Q. With different segments and traces
20 shown?

21 DR. STAMATAKOS: That's correct.

22 Q. Is the length of a fault a factor that
23 affects the force of a potential earthquake?

24 DR. STAMATAKOS: Well, one of the
25 considerations in determining how big earthquakes

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1 have occurred in the past is to look at the
2 dimensions of rupture. So fault length is one way,
3 fault area is another way that typically have
4 been -- parameters have been used to estimate
5 maximum magnitude, typically by correlating against
6 the ruptured dimensions of historic earthquakes and
7 establishing an empirical scaling relationship, if
8 you will.

9 Q. And what is the relative size of the
10 Wasatch fault versus the faults in the vicinity of
11 the PFS site?

12 DR. STAMATAKOS: Well, the cumulative
13 length of the Wasatch fault is more than 300
14 kilometers, but you want to be careful and make
15 sure that you're looking at individual segments or
16 sums of segments. Sometimes faults, when they
17 rupture, rupture several segments simultaneously
18 when developing those parameters. And I don't
19 think that the single rupture of the Wasatch fault
20 is one scenario that is considered in anybody's
21 hazard assessment. But certainly single rupture
22 segments or multiple segments, several segments at
23 the same time are considered.

24 Q. When you said a single rupture of the
25 Wasatch fault, you mean rupture of the entire fault

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1 at one time?

2 DR. STAMATAKOS: That's correct.

3 Q. It's not something that's considered?

4 DR. STAMATAKOS: I don't believe so.

5 JUDGE FARRAR: Mr. Turk, before we leave
6 Page 10, the sphere on the top center, does that
7 depict a real place?

8 DR. STAMATAKOS: No, it's a
9 representation of what we call a stereonet in
10 geology. The lower hemisphere of the stereonet.
11 So if you want to imagine, it's a two-dimensional
12 figure trying to represent a three-dimension
13 hemisphere and then --

14 JUDGE FARRAR: But a hemisphere that
15 exists where; in our mind?

16 DR. STAMATAKOS: It's just orientation.
17 It's just a way to gauge orientation. So north is
18 up, south is down, east is to the right, west is to
19 the left. And inclinations go from zero on the
20 edge to 90 degrees in the inside, and what you
21 would plot on there would be the poles or the
22 normals, the 90-degree normals to the fault planes
23 and see where they lie to judge where the slip
24 tendency values for that particular orientation of
25 the fault would occur.

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1 JUDGE FARRAR: But this doesn't
2 represent a particular location?

3 DR. STAMATAKOS: It's not a location.
4 It's a tool for evaluating geometry.

5 JUDGE FARRAR: Right. Okay, now I use
6 those -- taking the left-hand picture, I use the
7 colors -- the colors in your color chart to
8 understand about the east fault and the west fault?

9 DR. STAMATAKOS: That's correct. So
10 what you would do is for each note in this computer
11 program, it plots the pole to that particular part
12 of the fault and calculates where it would fall in
13 this hemisphere projection and assigns the
14 corresponding slip tendency value.

15 JUDGE FARRAR: Okay.

16 Q. (By Mr. Turk) If you could, I'd like a
17 little bit more explanation with respect to the
18 faults at the PFS site. We know that the site is
19 located in the basin and province range. I'm
20 sorry, the basin and range province?

21 DR. STAMATAKOS: That's correct.

22 Q. Could you describe the faulting pattern
23 that exists in that province.

24 DR. STAMATAKOS: General faulting
25 pattern in the basin and range are -- a predominant

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1 style are called normal faults. Normal faults are
2 extensional faults. It's the result of tension in
3 the crust rather than contraction or compression.
4 And so the dominant -- that's the dominant style of
5 faults within the basin and range. And I believe
6 we discuss a little bit in some of our reports that
7 deriving forces for that are gravitational, the
8 collapse of a thick crust and extension by the
9 imposed configuration of the Pacific plate out in
10 California against the North American plate.

11 Q. So essentially, the basin and range
12 province is pulling west away from the Wasatch
13 Front?

14 DR. STAMATAKOS: The basin and range
15 province is collapsing and extending roughly west.

16 Q. And the fact that the areas shown in red
17 here are primarily north/south or close to
18 north/south orientations of the fault, is that
19 related to this motion of the overall system?

20 DR. STAMATAKOS: Well, we've developed
21 what we think is a reasonable representation of the
22 stress state that's driving these faults, and so
23 the north/south or nearly north/south faults are in
24 a better or more optimal orientation to have lots
25 of shear stress on them relative to the normal

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1 stress and faults in that orientation. So they're
2 more likely to slip, more likely to be the active
3 faults. That's why the Wasatch fault I think has a
4 nearly north/south orientation. That's a very
5 active fault compared to many of the other faults.

6 Q. And this is all related to this western
7 extension of the basin and province range?
8 Extension meaning movement towards the west?

9 DR. STAMATAKOS: Basin and range
10 province, yes.

11 Q. I keep messing that up, forgive me.
12 There was some question about the 1.5
13 times number.

14 DR. STAMATAKOS: That's correct.

15 Q. Now, could you explain what that 1.5
16 represents? First of all, what numbers are you
17 comparing?

18 DR. STAMATAKOS: Well, what I'm simply
19 comparing, as an example, is I just took what would
20 be the exceedance, annual exceedance probability
21 for a .5 g or 500 centimeter per second square
22 acceleration for the curves plotted for Salt Lake
23 City in the Skull Valley rock curve. And so if you
24 go up the 500 centimeter per second square line and
25 see where it intersects against the probability,

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1 the .5 g corresponds to approximately four times 10
2 to the minus three for Salt Lake City.

3 Q. I'm sorry, could you look at that again,
4 please.

5 DR. STAMATAKOS: Excuse me, four times
6 10 to the minus four.

7 Q. I count -- yes, okay.

8 DR. STAMATAKOS: And the corresponding
9 one for .5 g on the Skull Valley rock would be
10 approximately six times 10 to the minus four. And
11 so that comparison leads to the statement which
12 says that given that amount of ground motion, it's
13 1.5 times more likely to occur in Skull Valley than
14 it is in Salt Lake City. So it's a comparison of
15 the relative probabilities, annual exceedance
16 probabilities for that particular level of ground
17 motion.

18 Q. And when you say it's 1.5 times more
19 likely to occur, you're saying according to the
20 Geomatrix presentation?

21 DR. STAMATAKOS: According to the
22 Geomatrix presentation of a calculation of the
23 hazard.

24 Q. I'd like to come to what is probably the
25 penultimate question before the Board with respect

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1 to whether or not the exemption request should be
2 approved, and that would appear to be the
3 appropriate return period at which to peg the
4 design-basis for the facility. And I have a number
5 of questions in that regard. First of all, I would
6 ask all of you whether you believe that a return
7 period of 2,000 years ground motion represents an
8 adequate level of conservatism for establishing the
9 return period design-basis for this facility?

10 DR. McCANN: Yes.

11 DR. STAMATAKOS: I agree.

12 DR. CHEN: I agree, too.

13 Q. I believe one of the judges, I think it
14 was Judge Kline, asked you, and Dr. McCann, I think
15 it was your answer, Judge Kline asked you if the
16 Board picked a number like 4,000 or said 4,000 is
17 appropriate, would that be wrong? And I believe
18 your answer, Dr. McCann, was that would not be an
19 error. Would you believe that a 4,000-year return
20 period would be appropriate for this facility, as a
21 design-basis?

22 DR. McCANN: No, I believe the
23 appropriate design level is the 2,000-year.

24 Q. You were also asked whether setting the
25 number somewhat higher, for instance at 2500 years

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1 or 3,000 years would result in much of a change for
2 the facility, and your answer had to deal with that
3 would depend how far -- or how close to the design
4 limits the facility had been built or is proposed
5 to be built. Do you know, if the Board seeks to
6 establish a different return period other than
7 2,000 years, how would that affect the Applicant's
8 design and the Staff's review of this application?

9 DR. McCANN: As I said in my response to
10 Judge Kline, I'm strictly speaking not in the
11 position to judge exactly, but from a general
12 understanding of the design process, my answer
13 focused principally on technical matters of
14 calculation of stress, et cetera. I believe I also
15 said, and I'm not sure I said it quite clearly
16 enough, it's my understanding that if there was a
17 change in the design-basis, although certain
18 calculations might not have to be, quote, started
19 from scratch with a new piece of paper, that the
20 process in its entirety would have to be revisited.
21 Meaning the engineers would have to go back and,
22 quote, redesign or redemonstrate the adequacy of
23 the design of SSCs. It would have to be submitted
24 to the Staff for their review. So the process
25 would be reinitiated, if you will.

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1 JUDGE FARRAR: Mr. Turk, let me back up
2 a question. You said in response to Mr. Turk's
3 question that you thought 2,000 was appropriate?

4 DR. McCANN: Yes.

5 JUDGE FARRAR: But I also would have
6 interpreted your answer to Judge Kline this morning
7 to agree that 4,000 was also appropriate?

8 DR. McCANN: I don't believe I said
9 that.

10 JUDGE FARRAR: Right, you didn't say
11 that, but that's how I heard the whole answer.

12 MR. TURK: That's why I'm asking.

13 DR. McCANN: Probably worth revisiting.
14 Judge Kline was pursuing a line of questioning
15 about the lack of, what I'll say is a hard
16 algorithm for finding the right number. And it is
17 a fair statement to say that that algorithm -- that
18 hard algorithm does not exist, say, even the way it
19 does in the DOE space. So lacking that hard
20 algorithm, one can certainly not claim that you
21 violated the algorithm by choosing 4,000 years.
22 What I would add to that, however, is the point
23 that the judgment and the final determination of
24 2,000 years as being appropriate, was the result of
25 a reason technical evaluation in which we

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1 considered the various potential end points, if you
2 will, of the range. For example, the Applicant
3 came in with a proposal for a thousand years, that
4 was rejected. We therefore know that that is --
5 anywhere near a thousand years is not appropriate.

6 We also know from the Commission's
7 statements and from the data that we have
8 available, that a 5,000-year is not reasonable,
9 either, because that would be equivalent to the
10 design-basis for a nuclear power plant in the west.
11 So now we're starting to get very, very bracketed.
12 And in our consideration, we now need to be away
13 from 5,000 years and considerably away from 1,000
14 years. And if you begin to look at that, 10
15 percent, 20 percent not being much of a difference
16 at all, factors of one and a half to two being a
17 reasonable change in probability of exceedance. So
18 being a factor of two away from ten to the minus
19 three brings us to five times 10 to the minus four,
20 and being a factor of two away from two times 10 to
21 the minus four brings us four times 10 to the minus
22 four and thus we concluded that 2,000 years was
23 appropriate.

24 JUDGE FARRAR: All right, thank you. Go
25 ahead, Mr. Turk.

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1 MR. TURK: Thank you, Your Honor.

2 Q. (By Mr. Turk) I'd like to particularize
3 this last answer a little bit. You were speaking
4 in terms of the average mean annual probability of
5 exceedance for western plants when you used the
6 term 5,000 years; correct?

7 DR. McCANN: Correct.

8 Q. In Dr. Cornell's testimony, he looked at
9 Appendix C to topical report YNP/TR003 for Yucca
10 Mountain, and some of the questioning in Appendix C
11 had to do with the specifics for each of the sites
12 listed on Table C2. I'd like to -- if I may show
13 this to the witnesses.

14 Dr. Stamatakos, I believe this is your
15 report actually, correct?

16 DR. STAMATAKOS: That's correct.

17 Q. Can you -- would you agree with
18 Dr. Cornell's representation as to the return
19 period for each of the facilities that are stated
20 there? And if you don't recall, maybe you could
21 tell us -- this is for Dr. Stamatakos -- what are
22 the return periods for those specific plants in the
23 west?

24 DR. STAMATAKOS: Do you want me to read
25 them all off again?

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1 Q. Very quickly, if you don't mind.

2 DR. STAMATAKOS: Okay. Diablo Canyon,
3 5,882 years, Palo Verde, 26,316 years, San Onofre,
4 3,330 years, Washington Nuclear Plant 2000, 33,571
5 years, Washington Nuclear Plant No. 3, 4,550 years.

6 JUDGE FARRAR: Are those the same
7 numbers Dr. Cornell gave us?

8 MR. TURK: I believe they are. They
9 might be a digit. He did his own calculation, and
10 I think he was agreeing with these numbers. There
11 might be some very small variation.

12 Q. (By Mr. Turk) The numbers you've just
13 given us, those are your calculations,
14 Dr. Stamatakos.

15 DR. STAMATAKOS: They're in my pencil
16 hand, so I must have made these at some point.

17 Q. So, in fact, Palo Verde is substantially
18 higher than a 5,000-year return period?

19 DR. STAMATAKOS: Yeah, Palo Verde is
20 clearly very different from the other four.

21 Q. Diablo Canyon is somewhat above 5,000
22 feet, I think it's 5,800?

23 DR. STAMATAKOS: That's correct?

24 Q. And the others are down in the range of
25 3300 to 4500?

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1 DR. STAMATAKOS: That's correct.

2 Q. So when we say that the western nuclear
3 power plants have an average mean annual
4 probability of exceedance of 5,000 years, that
5 doesn't reflect the individual variability between
6 the plants?

7 DR. McCANN: That's correct.

8 Q. Dr. McCann, you were opining at some
9 point that if you were king for a day, I think
10 those are your words, you would come up with your
11 own approach of looking at consequences and the
12 result of failure. Are you speaking now in terms
13 of what NRC requirements are, or is that an
14 approach that you would take if you were allowed to
15 appoint your own regulations?

16 DR. McCANN: It was just a personal
17 view. It's not a view or a regulation that the
18 Staff has.

19 Q. And also, given -- let me start first.
20 Do you have an understanding as to whether or not
21 cask tipover at the PFS site would result in
22 adverse or significantly adverse radiological
23 consequences?

24 DR. McCANN: It's my understanding that
25 the design-basis and beyond design-basis, that cask

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1 tipover does not occur and therefore, there's no
2 radiological consequence.

3 Q. And in light of that understanding, do
4 you believe there's a need to conduct a
5 probabilistic risk assessment here?

6 DR. McCANN: I believe I said this in
7 response to Judge Kline, that although, as a
8 general matter and a personal view, doing the risk
9 assessment would be informative and be something
10 that provides some insight. I think I also
11 concluded that in this particular case here, since
12 we don't have cask tipover and do not have,
13 therefore, cask rupture, it's very hard to argue
14 that you need any sort of a risk analysis. It's
15 pointless since there's no consequence.

16 Q. You think it would be pointless?

17 DR. McCANN: Yes.

18 Q. Is that what you said?

19 DR. McCANN: Yes?

20 Q. You also indicated that if the cask tips
21 over, there would be a mess to pick up. Could you
22 explain what you meant by that?

23 DR. McCANN: That was a loose statement
24 referring to the fact that if there were an
25 earthquake and it was capable of tipping over a

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1 cask, because the findings are that there is no
2 cask rupture, basically what you have are casks
3 that have tipped over and ought to be upright, and
4 someone would have to go in afterwards and upright
5 them.

6 Q. You weren't saying that there would be a
7 radiological mess to clean up?

8 DR. McCANN: No, because there's been no
9 rupture.

10 Q. If you look at the Geomatrix
11 evaluation -- and you understand their curve
12 represents all different return periods including
13 the 2,000-year as well as the 10,000-year return
14 period earthquakes; correct?

15 DR. McCANN: Correct.

16 Q. Looking at their calculation, could you
17 explain the standard to which a nuclear power plant
18 would have to be built at the PFS site if their
19 seismic hazard curve was an accurate depiction of
20 the actual seismic hazard?

21 DR. McCANN: Referring to the curve
22 that's now in Staff Exhibit JJ, if one assumes that
23 the reference probability is 10 to the minus four
24 for a nuclear power plant, which would be the
25 equivalent of the median reference probability of

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1 10 to the minus five, entering the hazard curve at
2 10 to the minus four would put you at a
3 design-basis earthquake of 1100 and -- 1.15 g.

4 Q. And what you're doing there is you're
5 going across horizontally from 10 to the minus four
6 and seeing where that intersects with the Skull
7 Valley soil spot?

8 DR. McCANN: That's correct.

9 Q. And by comparison, where is the Diablo
10 Canyon spot for annual probability of exceedance of
11 10 to the minus four?

12 DR. McCANN: That looks to be
13 approximately .95 g.

14 Q. And do you think it's reasonable to
15 believe that the PFS site would present a seismic
16 hazard that's that much greater or even greater at
17 all than the Diablo Canyon site?

18 DR. McCANN: On the face of it, that
19 result is quite surprising, and given that
20 Geomatrix has, in our interpretation and our
21 evaluation, made a conservative estimate, that may
22 explain part of it.

23 Q. One last question, and I ask this of
24 each of you. Do you believe that what you're being
25 asked to do in establishing a return period for the

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1 design-basis for this facility, is an exercise of
2 subjective judgment or objective, or how could you
3 explain that?

4 DR. McCANN: I'll refer to my response a
5 moment ago, that we had gone through a, what we
6 believe to be a reasonable technical evaluation to
7 arrive at what is an appropriate design-basis for
8 the PFS ground motion corresponding to a 2,000-year
9 return period.

10 DR. STAMATAKOS: And I would add to that
11 that we used -- we did rely on a fair bit of what
12 the Commission has provided us from prior
13 information, including what was done for TMI 2, the
14 recognition of the relative risks of these kinds of
15 facilities and DOE's approach in 1020. So that --
16 so once we recognized that we needed -- that an
17 adequate design-basis could be less than what's
18 required for nuclear power plants because of the
19 risk considerations, it was a matter of looking at
20 what was -- what the Commission has said about
21 other similar facilities and what the DOE has said
22 about other similar facilities, and those factors
23 were important in our evaluation.

24 Q. Dr. Chen, did you have anything that you
25 want to add?

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1 DR. CHEN: No, I don't have anything to
2 add.

3 Q. If the Licensing Board was to say that
4 2500-year return period was more appropriate than
5 2,000-year return period, could you state whether
6 you believe that would make a significant
7 difference in terms of protection of public health
8 and safety?

9 DR. McCANN: No, I don't believe it
10 would add to the health and safety of the public to
11 change to 2500 years.

12 Q. And could you explain why?

13 DR. McCANN: The difference between a
14 2500-year and a 2,000-year likelihood of exceedance
15 of the design-basis ground motion would, in my
16 view, make a small change on the order of 20
17 percent, possibly even less, in the likelihood that
18 there would be adverse consequences at the facility
19 and to the public that might be nearby. And that
20 difference is very small in a risk context.

21 Q. And when you say adverse consequences,
22 you're referring to a potential for cask tipover or
23 a potential for radiological release, or what?

24 DR. McCANN: To getting into a situation
25 where you would actually have a release at the

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1 site. Not just cask tipover, but also a rupture
2 and the potential for release.

3 Q. I'm not sure I understand. You've
4 stated that for a 10,000-year return period
5 earthquake, you wouldn't have a release. Are you
6 saying that for a 2500-year return period, you
7 would?

8 DR. McCANN: If I understood your
9 question, your question was, if the design-basis
10 was changed from a 2,000-year to a 2500-year ground
11 motion, would that add to the health and safety
12 that's provided for the public. And my answer is
13 no, if measured in terms of the risk to the public.
14 And as part of that, I said that the change in that
15 ground motion would not have a significant impact
16 on the likelihood that there would be an adverse
17 consequence on-site. Meaning that you would have a
18 facility that was much safer in terms of the
19 potential for cask tipover and cask rupture.

20 Q. I see, thank you. Dr. Stamatakos, do
21 you have anything you want to add to that?

22 DR. STAMATAKOS: No.

23 Q. Dr. Chen?

24 DR. CHEN: No.

25 MR. TURK: Your Honor, I think that does

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1 it for us.

2 JUDGE FARRAR: Ms. Chancellor.

3 MS. CHANCELLOR: Hopefully I only have a
4 few questions, Your Honor. I know you want to wrap
5 this up.

6 JUDGE FARRAR: Okay.

7

8 RE CROSS EXAMINATION

9 BY MS. CHANCELLOR:

10 Q. Dr. McCann, you were asked to evaluate
11 the appropriateness of using a 2,000-year
12 design-basis earthquake for the PFS facility; is
13 that correct?

14 DR. McCANN: It was proposed by the
15 Applicant, yes. And Geomatrix has a report that we
16 reviewed.

17 Q. You were not asked to review PFS's
18 seismic design; isn't that true?

19 DR. McCANN: The design of structures?

20 Q. Structures, the pads, the CTB, the
21 casks, you weren't asked to evaluate their seismic
22 design, were you?

23 DR. McCANN: No, we were not.

24 Q. So you can't testify as to the closeness
25 of the design margins in PFS's design based on the

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1 2,000-year design-basis earthquake, can you?

2 DR. McCANN: Not in detail, no.

3 Q. And with respect to whether the cask
4 will tip over and not release radiation, you
5 haven't reviewed that analysis, have you?

6 DR. McCANN: I have not reviewed the
7 tipover analysis. Just observed what was presented
8 here by the various experts.

9 Q. And you also testified that a 5,000-year
10 return period was not reasonable for the PFS site
11 because it would be the starting point for a
12 nuclear power plant in the Western U.S.; is that
13 correct?

14 DR. McCANN: I said that the -- that a
15 starting point was the Regulatory Guide 1.165 at 10
16 to the minus four, and that if we take the
17 information that we have available for the Western
18 U.S. plants and for -- and the information and
19 guidance provided in Regulatory Guide 1.165, that a
20 nuclear power plant in the west, it seems would
21 have a reference probability of approximately two
22 times 10 to the minus four mean probability.

23 Q. Isn't it true that if a nuclear power
24 plant in the Western U.S. submitted an application
25 to NRC under Reg Guide 1.165, the given starting

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1 point would be a 10,000-year return period
2 earthquake? The given starting point.

3 DR. McCANN: Well, if you refer
4 specifically to 1.165, its reference probability is
5 10 to the minus five median probability. But
6 because we're dealing with mean hazards here, we've
7 referred to the 10 to the minus four, which is the
8 equivalent of the 10 to the minus five that is
9 written in 1.165.

10 Q. Isn't it true that if a nuclear power
11 plant in the west wanted to propose something that
12 was different from a 10,000-year return period
13 earthquake, they would have to defend that with
14 specific data analyses, et cetera?

15 DR. McCANN: Yes.

16 Q. Isn't it true that on the Yucca Mountain
17 topical report Appendix C, that the Palo Verde
18 plant is in a very low seismicly active area in
19 Arizona?

20 DR. McCANN: Yes, I believe that's
21 generally true, that Palo Verde is in a lower
22 seismic hazard area, yes.

23 Q. Isn't it true that the Washington
24 Nuclear Power Plant 3 was never operated?

25 DR. McCANN: That, I don't know.

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1 MR. TURK: No. 3.

2 DR. McCANN: I don't know.

3 Q. (By Ms. Chancellor) Isn't it true that
4 the five nuclear power plants listed on Appendix C,
5 that these exceedance probabilities are derived
6 from all deterministic seismic hazard analyses?

7 DR. McCANN: Could you restate that.

8 Q. Isn't it true that the exceedance
9 probabilities on Appendix C are derived from all
10 deterministic seismic hazard analysis for these --
11 for the five nuclear power plants listed in that
12 table?

13 DR. McCANN: That's what I thought you
14 said. No, deterministic analyses don't calculate
15 exceedance probabilities.

16 Q. Isn't it true that under EP Triple I,
17 that the nuclear power plants went back and
18 reevaluated their deterministic seismic hazard
19 analyses and came up with a probabilistic
20 exceedance value?

21 MR. SILBERG: Excuse me, did you say EP
22 Triple I?

23 MS. CHANCELLOR: EP Triple E, I believe
24 I said. EP Triple E.

25 MR. SILBERG: Thank you.

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1 DR. McCANN: Could you restate it.

2 MR. TURK: You can have the reporter
3 read it back.

4 MS. CHANCELLOR: No, I've got a little
5 help here. Let me try this again.

6 Q. (By Ms. Chancellor) Isn't it true that
7 the exceedance probabilities in Appendix C come
8 from comparing the deterministic design ground
9 motions with a probabilistic seismic hazard
10 analysis?

11 DR. McCANN: For --

12 Q. For the five nuclear power plants in the
13 west?

14 DR. McCANN: For these nuclear power
15 plants as well as all the nuclear power plants
16 considered in the development of 1.165, all of the
17 design-basis ground motions were developed on the
18 basis of deterministic hazard analyses, and then
19 given the design-basis ground motion for each of
20 the plant sites, one enters the seismic hazard
21 curves to determine the probability of exceedance?

22 Q. And what these design -- these
23 deterministic design ground motions, weren't these
24 computed, say, in the '70s, when the nuclear power
25 plants were licensed?

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1 DR. McCANN: Approximately, yeah, over
2 many years.

3 Q. Isn't it true that there have been great
4 strides in evaluating ground motions since the
5 1970s?

6 DR. McCANN: Things have changed, yes.

7 Q. And in general, haven't ground motions
8 been greater than what was once thought?

9 DR. McCANN: Not for purposes of design,
10 no.

11 Q. You mention that a probabilistic risk
12 assessment was done for INEEL. Do you recall that
13 testimony?

14 DR. McCANN: I recall saying that it was
15 my understanding that a risk analysis -- some sort
16 of a risk analysis had been done for the TMI ISFSI
17 analysis.

18 Q. Was that submitted to the NRC as part of
19 INEL's exemption request, that PRA?

20 DR. McCANN: I don't know enough about
21 it. I just remember reading reference that some
22 risk calculations had been performed. I actually
23 don't know by whom.

24 Q. And you also stated that Diablo Canyon
25 submitted a PRA, maybe as part of its -- as part of

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1 a regulatory requirement?

2 DR. McCANN: Yes.

3 Q. And how many operating nuclear power
4 plants have ground motions equal to or greater than
5 0.7 g other than Diablo?

6 DR. McCANN: Design-basis ground
7 motions?

8 Q. Yes.

9 DR. McCANN: I don't know of any.

10 Q. You also testified that the Commission
11 has stated and maybe even quantified that operating
12 nuclear reactors are safe. Do you recall that
13 testimony?

14 DR. McCANN: Yes.

15 Q. Do you anticipate that the Commission
16 will change its mind after holes are being found in
17 the reactor vessel of Davis ISFSI?

18 MR. TURK: Objection, we're going a
19 little bit beyond anything.

20 MS. CHANCELLOR: He testified that
21 reactors are safe. I'm just asking if the
22 Commission may change its mind after Davis ISFSI.

23 JUDGE FARRAR: Even without an
24 objection, that's a very interesting question but
25 not one we're going to have to explore here.

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1 MS. CHANCELLOR: I think I've explored
2 as far as I can go, Your Honor. I have no further
3 questions.

4 JUDGE FARRAR: There was one question
5 Ms. Chancellor asked you about in recent years,
6 aren't ground motions greater. That could be read
7 two ways. Are you requiring plants to be designed
8 to higher standards than you used to, or has
9 additional analysis of historic earthquakes
10 revealed that they were, in fact -- had stronger
11 ground motion than we thought? Which way did you
12 interpret the question? Or you can answer both of
13 them, if you want to.

14 DR. McCANN: The way I interpreted the
15 question was closer to your former statement. And
16 the expanded answer is that because the
17 design-basis ground level for the existing nuclear
18 power plants is considered reasonable and
19 appropriate and the design for future nuclear power
20 plants as fully articulated in 1.165, is
21 benchmarked on those design-basis ground motions.

22 JUDGE FARRAR: Okay. Do we have any
23 need to question these witnesses any further?

24 MR. TURK: May I confer with the
25 witnesses for a moment, Your Honor? I think I'm

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1 done, but I want to see if there's any possible
2 follow-up.

3 MR. GAUKLER: One housekeeping matter, I
4 had objected to State's Exhibit 185 on the basis,
5 depending on what happened with the Staff Exhibit
6 R, and given the resolution of Staff Exhibit R, I
7 withdraw my objection to State Exhibit 185.

8 MS. CHANCELLOR: Thank you, Mr. Gaukler.
9 I owe you one.

10 JUDGE FARRAR: 185 will be admitted.

11 MS. CHANCELLOR: Thank you, Your Honor.
12 Thank you, Mr. Gaukler.

13 MR. GAUKLER: You're welcome.

14 MR. TURK: Your Honor, we have just one
15 follow-up question.

16

17 FURTHER REDIRECT EXAMINATION

18 BY MR. TURK:

19 Q. Dr. McCann, you stated that you don't
20 know of any nuclear power plants that have higher
21 than a .7 g ground motion. Have you had an
22 opportunity to think about that answer?

23 DR. McCANN: I think --

24 MS. CHANCELLOR: Objection. Did
25 Mr. Turk prompt the answer?

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1 MR. TURK: Well, he has to do his own
2 thinking.

3 JUDGE FARRAR: Well, I was afraid while
4 you were over there that Ms. Chancellor was going
5 to object that the witness was leading you. But is
6 this a matter of official Commission records or
7 something?

8 MR. TURK: Well, it would be, but I
9 think what Ms. Chancellor will propose to you is a
10 finding that says the PFS site has a higher ground
11 motion than any other nuclear power plant site in
12 the country.

13 MS. CHANCELLOR: I'd have to cite
14 something.

15 MR. TURK: And I think if that's the
16 proposed finding, we should put something in the
17 record that answers that.

18 JUDGE FARRAR: If the witness knows, he
19 can answer it.

20 DR. McCANN: Well, just to clarify, I
21 believe counsel's question was with the exception
22 of Diablo Canyon.

23 MS. CHANCELLOR: That's correct.

24 DR. McCANN: Right. And my
25 understanding, Diablo Canyon's design-basis ended

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1 up being approximately .75 g, give or take. I
2 don't remember the exact number. Which is higher
3 than its original design-basis, which I think was
4 in the .5ish range, and after the discovery of the
5 Hodge Creek fault, it increased.

6 Q. (By Mr. Turk) And may I just ask for a
7 clarification also, Your Honor. Are you aware of
8 what the design-basis ground motion is at Rancho
9 Cinco?

10 DR. McCANN: I don't know?

11 Q. Are you aware of what it is at Humbled
12 Bay?

13 DR. McCANN: No?

14 Q. Trojan?

15 DR. McCANN: No?

16 Q. San Onofre?

17 DR. McCANN: No.

18 Q. You're not aware of those?

19 DR. McCANN: No, not off the top of my
20 head.

21 MS. CHANCELLOR: Your Honor, I have just
22 one quick question that I forgot to ask and it
23 should only take a second.

24 JUDGE FARRAR: Go ahead.

25

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FURTHER RECROSS EXAMINATION

1
2 BY MS. CHANCELLOR:

3 Q. If you look at Page 5 of the notebook,
4 Staff's Exhibit JJ, if you were to assume a
5 2500-year earthquake or four times 10 to the minus
6 five -- four times 10 to the minus four, that would
7 be the -- on the Y axis, that would be the little
8 digit just below the 2,000-year; is that correct?

9 DR. STAMATAKOS: That's correct.

10 DR. McCANN: Yes.

11 Q. And if you go over to the Skull Valley
12 soil site, what would the approximate PGA be for a
13 2500-year earthquake?

14 DR. STAMATAKOS: Approximately .8.

15 Q. .8. Thank you.

16 MR. TURK: I'm sorry, could you --
17 well --

18 JUDGE FARRAR: The witness can explain
19 it to you after. He got it, we got it.

20 MR. TURK: My motor must be on slow
21 today.

22 JUDGE FARRAR: All right. I urge the
23 witnesses to leave while they can before somebody
24 thinks of more questions. How much time -- and
25 thank you for sharing your insights and testimony

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1 with us. The Board appreciates it. How much time
2 do we need to do the switch-over to aircraft?

3 MR. GAUKLER: 10, 15 minutes.

4 JUDGE FARRAR: Let's see if we can do it
5 in 10. It's 25 of, be back at a quarter of.

6 (A discussion was held off the record.)

7 JUDGE FARRAR: We're back trying to
8 clarify the last answer.

9 MR. TURK: That last question that I had
10 a problem with that apparently everyone else
11 understood, I don't see where a .8 comes in when
12 you do a -- when you try to draw the intersection
13 of a 2500-year earthquake with the peak ground
14 acceleration. I'd ask Dr. Stamatakos to carefully
15 try to use a ruler and give us a more exact number.
16 It's my understanding that it's less than .8.

17 DR. STAMATAKOS: According to Marty's
18 ruler, it's .75.

19 MR. TURK: Thank you very much.

20 JUDGE FARRAR: That's it.

21 (A recess was taken.)

22 JUDGE FARRAR: We have switched
23 reporters, we have switched lawyers, we have
24 switched witnesses, but the Board goes on.

25 Colonel Horstman, you were here some

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1 time ago. You were sworn then, so if you will
2 consider yourself still under oath.

3 COL. HORSTMAN: Yes, sir.

4 MR. GAUKLER: Good afternoon, your
5 Honors. To try to make things go fast, I have
6 handed out copies of the transcript of that first
7 week of the hearing. Everybody should have that as
8 well as the transcripts again of Lieutenant Colonel
9 Horstman's two depositions and a copy of the
10 declaration, the January 30, 2001 declaration.

11 JUDGE FARRAR: We appreciate that, Mr.
12 Gaukler. It should make things go faster. Thank
13 you.

14 MR. GAUKLER: I think I have also handed
15 out PFS Exhibit X, which is Table 1 as marked up by
16 Lieutenant Colonel Horstman in his July, 2001
17 deposition.

18
19 CONTINUED CROSS-EXAMINATION

20 BY MR. GAUKLER:

21 Q. Are you situated up there?

22 A. I believe so, yes.

23 Q. Good afternoon, Lieutenant Colonel
24 Horstman.

25 A. Good afternoon. Thank you.

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1 Q. The last time we were together in April,
2 one of the topics that we were discussing was your
3 review of the F-16 aircraft accident reports. And
4 specifically we had discussed PFS Exhibit X, which
5 I included in materials handed out that should be
6 the Table 1 as you marked up at your July, 2001
7 deposition. Do you see that there?

8 A. Yes, I do.

9 Q. And this table just shows your
10 evaluation of the accident reports, your review and
11 evaluation of Gen. Cole's, Gen. Jefferson's, and
12 Col. Fly's categorization of the accident reports
13 based on your review of those reports.

14 A. That's correct, sir.

15 Q. And the last time we met in April, you
16 stated that in your review of these reports, you
17 believed yourselves to be bound by the definitions
18 of the categories provided in Tab H of the Aircraft
19 Crash Reports. Do you remember that?

20 A. I'm not sure if those were my exact
21 words, but that was the basic intent, yes.

22 Q. That was the basic intent.
23 Specifically, we were talking about the definitions
24 for the -- looking at PFS Exhibit X, Definitions
25 for ACRAM Phase, Engine Failure, Able to Avoid

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1 PFSF, Sevier B Flight Conditions, and Skull
2 Valley-type Events which appear towards the top of
3 that table; correct?

4 A. That's correct, sir.

5 Q. As we discussed last time, you filed a
6 declaration in support of the State's opposition to
7 PFS's motion for summary disposition. And that
8 declaration was dated January 30, 2001. You should
9 have that in the materials we handed out to you.

10 A. I do have that.

11 Q. Now, that declaration sets forth,
12 doesn't it, the results of your review of the
13 accident investigation reports? And I would direct
14 you, I believe, to Page 10, approximately.

15 MR. SOPER: I object to the
16 characterization of it. It speaks for itself.

17 MR. GAUKLER: Just trying to move this
18 along, your Honor.

19 Q. (By Mr. Gaukler) Do you see that?

20 A. I'm not sure of the question.

21 Q. Is it true that Page 10 -- starting with
22 Paragraph 34 through Paragraph 59 on Page 17, that
23 sets forth your review of the accident reports as
24 you report in your declaration in opposition to the
25 PFS's motion for summary disposition?

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1 A. That's correct, sir.

2 Q. And here you stated your disagreement
3 with certain parts of PFS's evaluation of those
4 reports. Correct?

5 A. That's correct.

6 Q. And isn't it true that your disagreement
7 included not only changing the assigned category of
8 an accident, like from changing the category on
9 Able to Avoid from yes to no, but also creating an
10 entirely new category called Skull Valley
11 Conditions, to replace one of PFS's categories?

12 A. I'm not sure.

13 Q. Could you take a look at Paragraph 41 of
14 the declaration. Could you look specifically at
15 the last two sentences in that paragraph.

16 A. Yes.

17 Q. There you claim that PFS has defined the
18 Sevier B MOA flight conditions category too
19 narrowly; correct?

20 A. That's correct.

21 Q. And the last sentence of that paragraph
22 starts out with the words, "This category," and
23 "this category" refers to the Sevier B MOA flight
24 conditions; correct?

25 A. One second, please. Yes.

1 Q. And the sentence goes on to read, "This
2 category should be modified to consider accidents
3 which could occur under Skull Valley Conditions
4 (Skull Valley Conditions) such as altitudes between
5 500 and 18,000 feet above ground level, flights
6 under instrument flight rules, flights with cloud
7 cover above or below the pilot, et cetera."

8 A. That's correct.

9 Q. And you were saying, therefore, weren't
10 you, that the definition of Sevier B flight
11 conditions, the definitions for that category
12 should be modified and expanded to include flights
13 beyond those included in that category by Gen.
14 Cole, Gen. Jefferson, and Col. Fly? Is that
15 correct?

16 A. You could do it with Sevier B, or, as I
17 said, Skull Valley Conditions.

18 Q. My question was you were saying here the
19 category of Sevier B flight conditions should be
20 expanded to include flights beyond those included
21 in that category by Gen. Cole, Gen. Jefferson, and
22 Col. Fly.

23 A. Correct.

24 Q. And just take as an example in Paragraph
25 44 of your declaration, if you look at Paragraph

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1 44, there you take an accident which occurred at
2 7,000, 8,000 feet AGL? Is that correct?

3 A. Yes.

4 Q. And that accident would not be included
5 in the definition of Sevier B MOA flight conditions
6 as defined in the Aircraft Crash Report at Tab H.
7 Correct?

8 A. That's correct.

9 Q. And you are stating here that you agree
10 that this accident, which was not defined in Sevier
11 B flight conditions in Tab H, should be included in
12 this new category that you have created called
13 Skull Valley Conditions; correct?

14 A. Correct.

15 Q. And if you look at the PFS Exhibit X,
16 for the April 4, 1991 flight you changed the "no"
17 under the Sevier B flight conditions to "yes";
18 correct?

19 A. That's correct.

20 Q. Therefore, it is fair to conclude that
21 you did not feel bound by the definition that Gen.
22 Cole, Gen. Jefferson, and Col. Fly had set out for
23 Sevier B flight conditions in Tab H then, did you?

24 A. I attempted to use the same boundaries
25 that they used and agreed or disagreed based on

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1 those boundaries.

2 Q. But you expanded the boundaries in this
3 instance; didn't you?

4 A. I'm sorry?

5 Q. You expanded the boundaries. You
6 included flights they would not have included like
7 flights above 5,000 feet AGL. Isn't that correct?

8 A. That is correct.

9 Q. Now, another part of the definitions
10 that we were talking about is the definition of
11 ACRAM phase. And isn't it true that you also did
12 not believe yourself to be bound by the ACRAM phase
13 flight definition provided by Gen. Cole, Gen.
14 Jefferson, and Col. Fly in Tab H?

15 A. As I stated before, I attempt to use
16 those boundaries, and in the case of the ACRAM
17 phase there are many accidents that could be
18 considered in three different phases. So I'm not
19 sure exactly what you are asking.

20 Q. I'd like to have you take a look at
21 Pages 79 to 82 of your July, 2001 deposition. And
22 at the same time I'll ask if you will take a look
23 at the definition in Tab H on Page 10 of the ACRAM
24 flight phase as set forth there by Gen. Cole, Gen.
25 Jefferson, and Col. Fly.

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1 A. I have page 79. Which document from
2 Page 10?

3 Q. The Aircraft Crash Report, Tab H, Page
4 10 of that.

5 MR. GAUKLER: Your Honor, for the
6 record, we have handed out a redacted version of
7 the Aircraft Crash Report and revised it into one
8 book to try to hopefully ease the burden of
9 carrying many notebooks around.

10 JUDGE FARRAR: Appreciate that.

11 MR. GAUKLER: And the State has not yet
12 had a chance to review everything so it --

13 JUDGE FARRAR: Wasn't this already
14 admitted?

15 MR. GAUKLER: It's admitted, but we were
16 talking and they wanted to review the redactions.

17 JUDGE FARRAR: And what tab are we
18 dealing with?

19 MR. GAUKLER: Tab H.

20 A. I have both references now.

21 Q. (By Mr. Gaukler) Okay. In the
22 deposition, starting at Page 79, bottom of Page 79,
23 we are talking about the February 20, 1991
24 accident.

25 A. Yes.

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1 Q. And isn't it correct to say that you
2 disagreed with the ACRAM Phase of Flight category
3 as applied by Gen. Cole, Gen. Jefferson, and Col.
4 Fly to that accident?

5 A. That's correct.

6 Q. And they had determined that it was in
7 the landing phase of flight; correct? If you look
8 at Table 1 of PFS Exhibit X.

9 A. That's correct.

10 Q. And you thought it should be normal;
11 correct?

12 A. That's correct.

13 Q. And you see there I asked you if you
14 were familiar with the ACRAM definitions of normal
15 and Takeoff and Landing, and Inflight.

16 A. I see that.

17 Q. And you referred back to the definition
18 in Tab H.

19 A. Correct.

20 Q. And if you look at the definition in Tab
21 H for Takeoff and Landing that's on Page 10, do you
22 see that?

23 A. I see that.

24 Q. And it's very short. "Accidents
25 occurring while the aircraft is in the process of

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1 taking off or landing, including takeoff roll,
2 abort/discontinue, and initial climb, the landing
3 pattern, final approach, flare and rollout portions
4 of the flight. The aircraft crash is within
5 approximately ten miles of the runway. Both "on
6 runway" and "off runway" accidents are included in
7 this category." And in your answer you
8 specifically took issue with Gen. Cole's, Gen.
9 Jefferson's, and Col. Fly's inclusion in this
10 definition of Takeoff and Landing that an aircraft
11 crash be within approximately ten miles of the
12 site.

13 A. That's correct.

14 Q. And you indicated that you did not
15 believe that was what ACRAM intended; correct? If
16 you look at the top of page 81 of the deposition.

17 A. That's correct.

18 Q. And then I requested your view of ACRAM;
19 correct?

20 A. That's correct.

21 Q. And then at the end, on the bottom of
22 Page 81, I said or I asked and, "Do you think your
23 view is consistent with ACRAM?" And your response
24 was? Bottom of Page 81.

25 A. Sorry. I said, "I think our view is

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1 consistent with reality."

2 Q. Correct. So isn't it true that you did
3 not feel bound by the ACRAM definition either as
4 provided by Gen. Cole, Gen. Jefferson, and Col. Fly
5 in the Aircraft Crash Report in your evaluation,
6 regardless of whether you thought it was within
7 or -- regardless of whether you thought their
8 definition was within or without of ACRAM.

9 A. No. My intent when I analyzed the
10 accidents was to determine whether or not we agreed
11 with, in this case, whether it was takeoff or
12 landing. And I would like to give you an example.
13 The U.S. Air Force has an aerial demonstration team
14 called the Thunderbirds and there are seven
15 airplanes and they are painted pretty and do air
16 shows all over the world. They never leave the ten
17 mile radius of the air field. They go 500 knots,
18 pull 9g's and do a variety of highly aggressive
19 maneuvers, high speed flight, low speed flight,
20 upside down, all kinds of crazy things.

21 If any of those aircraft were to crash
22 during those types of activities, where would I put
23 it in the phases of flight according to ACRAM?
24 Well, it's a grey area. It could be all three. So
25 is it a takeoff/landing, is it a normal, or a

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1 special? And there's a number of issues with that;
2 for example, defining the initial climb, or is
3 "approximately ten miles" nine and a half miles or
4 is it eleven? So I tried to stay within the bounds
5 as they were defined, and there's a lot of grey
6 areas in those definitions.

7 For another example, an aircraft is in a
8 bombing pattern doing aggressive air-to-ground
9 bombing and he hits the ground. That is clearly a
10 special inflight. That same airplane, 90 seconds
11 later, is 3000 feet above the ground at 400
12 nautical miles per hour. He is on the bombing
13 range but he is not doing a bombing activity. So
14 where would you put that category? It could go in
15 two different categories. So it is more of a
16 description as opposed to trying to stay within or
17 exclude the boundaries.

18 Q. But my point was that regardless of
19 whether you disagreed or agreed with the definition
20 provided by Gen. Cole, Gen. Jefferson, and Col. Fly
21 in Tab H here at Page 10, you did not believe
22 yourself bound by those definitions as set forth on
23 Page 10?

24 MR. SOPER: I object to the form of the
25 question. Bound for what purposes? I think he has

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1 explained his answer.

2 MR. GAUKLER: I don't think he has
3 answered my question. I think he has avoided it.
4 Let me rephrase it and see if that could take care
5 of some of the problem.

6 Q. (By Mr. Gaukler) Regardless of whether
7 you agree with Gen. Cole, Gen. Jefferson, or Col.
8 Fly's definition of the ACRAM definition or the
9 ACRAM definitions themselves, you do not feel
10 yourself bound by the ACRAM definitions as they
11 were provided by Gen. Cole, Gen. Jefferson, and
12 Col. Fly in Tab H of the Aircraft Crash Report.

13 A. I believe I did. I believe I attempted
14 to try to categorize it as accurately as possible.
15 And there are numerous areas where there is no
16 definition. I just gave you two.

17 Q. Well, in this instance they had in
18 there, specifically, an accident that occurred
19 within 10 miles of the runway; correct?

20 A. That is correct.

21 Q. And you disagreed with that portion and
22 didn't apply that portion of the definition;
23 correct?

24 A. No, I applied it -- it says "accidents
25 occurring". It doesn't say where the airplane

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1 impacted. When the airplane engine quit, that's
2 where the accident occurred. Where it impacts is a
3 completely separate issue.

4 Q. So it's fair to say you made your
5 assessment of whether the accident was takeoff,
6 special, or normal, regardless of what was said
7 here in this definition, or regardless of what
8 ACRAM said; correct?

9 A. No.

10 Q. How did you get another answer in this
11 instance, then?

12 A. Let's go back to the range accident that
13 could have been considered all three. I believe
14 that when I'm evaluating these, there's a number of
15 categories that apply. In one case there's all
16 three categories. Where do you place it? If you
17 are the range control officer, you place it one
18 place; if you are the tower controller you place it
19 another place; and if you are a pilot, you place it
20 where the accident occurs. If you have an engine
21 that fails at 30,000 feet, where does the accident
22 occur; where the airplane impacts, where the engine
23 quits, halfway between? So there are a number of
24 areas where the definition doesn't apply
25 appropriately.

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1 Q. And you applied your professional
2 opinion to select what you believed was the most
3 appropriate in those instances; correct?

4 A. That is correct, sir.

5 JUDGE FARRAR: Let me make sure I
6 understand this. Take your Thunderbirds, if the
7 pilot doesn't think he is landing, if he is doing
8 one of his acrobatic maneuvers and he crashes on
9 the runway, even though it would fit the definition
10 that it was within ten miles of the runway, the
11 pilot didn't think, under the first sentence, that
12 he was in the process of landing. Is that what you
13 are talking about and how you --

14 LT. COL. HORSTMAN: That's correct. The
15 pilot, at that time, is performing a high
16 performance maneuver and happens to impact the
17 earth within ten nautical miles of a runway. Was
18 the pilot at a landing or takeoff mentality at that
19 time? Well, if his gear is not down, he has either
20 made a tremendous judgment error or it is not a
21 takeoff and landing accident to the pilot.

22 JUDGE FARRAR: So in that case, would
23 you say you are disagreeing with the definition or
24 applying the definition?

25 LT. COL. HORSTMAN: You could apply all

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1 three definitions to this case. And which one you
2 choose would depend on where you sit, I think.

3 JUDGE LAM: If we may get off the record
4 for a minute, let me take this opportunity to
5 welcome my wife to this proceeding. I am happy to
6 report that she is having a wonderful time in Salt
7 lake City, and I'm happy she is here instead of
8 shopping.

9 (Discussion off the record.)

10 Q. So in those instances, you applied your
11 professional judgment in those instances where the
12 definition didn't apply clearly?

13 A. Yes, sir. That's correct.

14 Q. Turning to the definition of Skull
15 Valley-type event, which is on Page 11-12 of Tab H.
16 Let me know when you have had a chance to review
17 that.

18 A. Okay.

19 Q. Is there anything in that definition of
20 Skull Valley-type events that would prevent you
21 from using your professional judgment to reach an
22 opinion on whether an accident could or could not
23 have occurred in Skull Valley?

24 A. Give me one second, please.

25 Yes, there are. Let me expand upon

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1 that. The Skull Valley-type events, Paragraph 4,
2 is further expanded on Page 14 and 15 which
3 provides some parameters which aren't in Paragraph
4 4. So in this case if an airplane's engine were to
5 seize at 19,000 feet, that could be excluded from a
6 Skull Valley-type of event. If an aircraft was
7 instrument meteorological conditions, you could
8 exclude that. You could exclude certain things
9 which I believe could happen in Skull Valley.

10 Q. So you don't -- first of all, just
11 focusing on what is on Pages 11-12, you don't find
12 anything in that part of the report that would
13 affect your professional opinion, then? Is that
14 correct?

15 A. That's correct.

16 Q. Now, if you will go back to Page 9,
17 which is the beginning of the section in which
18 those definitions appear, and the section is
19 entitled Evaluation Parameters for Data Categories.
20 Correct?

21 A. I have that.

22 Q. And the first paragraph there says, at
23 least the first part says, "As discussed above,
24 Gen. Cole, Gen. Jefferson, and Col. Fly established
25 and defined the relevant evaluation parameters for

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1 performing their review and analysis of the
2 accident reports. The full definitions of these
3 parameters, as developed by Gen. Cole, Gen.
4 Jefferson, and Col. Fly are set forth below. The
5 results of each evaluation parameter for each
6 accident analyzed is shown as one of the data
7 columns or categories set forth in the data tables
8 attached at the end of this tab. The results are
9 also summarized at the end of this Section." So if
10 you go or then turn the page, you will see about
11 from Pages 9 to 12, you see about five definitions.
12 Correct?

13 A. I see eight definitions if you
14 include --

15 Q. If you include the subcategories of the
16 ACRAM phase.

17 A. Yes, sir. That's correct.

18 Q. And then at the end of that, end of Page
19 12, you see kind of a summary of results that was
20 referred to in the opening paragraph.

21 A. Yes, sir.

22 Q. And so at least this section purports to
23 set forth the definitions used in the evaluation;
24 isn't that correct?

25 A. That's what it says.

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1 Q. And now if you go to -- you were
2 referring to Pages 14 and 15. And could you read
3 the title on Page 13, the main heading, Capital C
4 under which those pages appear?

5 A. "First Statistical Analysis of Fraction
6 of Accidents in which a Pilot Could Avoid the
7 PFSF".

8 Q. So isn't this section setting forth Gen.
9 Cole, Gen. Jefferson, and Col. Fly's evaluation of
10 the application of the definitions to the accident
11 investigation reports?

12 MR. SOPER: Let me object to that
13 question on the basis of foundation. He is asking
14 for their purpose in doing this, which I don't
15 think the witness has any idea.

16 JUDGE FARRAR: Mr. Gaukler?

17 Q. Is it your understanding from that, that
18 the purpose of this section is to set forth the
19 results of the evaluation of Gen. Cole, Gen.
20 Jefferson, and Col. Fly in terms of the application
21 --

22 A. It does --

23 JUDGE FARRAR: Wait. There's an
24 objection.

25 MR. GAUKLER: I tried to rephrase the

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1 question. It is to his understanding.

2 JUDGE FARRAR: Doesn't it kind of speak
3 for itself? I mean, it is what it is.

4 Do you think you can characterize it?

5 LT. COL. HORSTMAN: I believe I can.

6 JUDGE FARRAR: Go ahead. The objection
7 is overruled.

8 A. If you look at Page 11, the Skull
9 Valley-type events, it's a pretty generic
10 definition and they go further to define some more
11 details later on. So the first definition is
12 really generic in nature. And they provided us
13 with some other parameters from which to look. And
14 I believe that they are part of the definition.

15 Q. You believe they are part of the
16 definition as opposed to their application of the
17 definition -- their application of the definition
18 to the accident reports? Is that the way you
19 interpret this?

20 A. It's a good question. I don't know what
21 they intended. What I did was used all the
22 information available to determine what a
23 particular phase of flight was, based on all the
24 information that was provided to me.

25 Q. Now, you see this information in this

1 part, you refer to Pages 14 and 15 specifically.

2 A. There is. And I'll expand. "Such as
3 engine failure caused by flight in a high altitude,
4 low speed conditions --"

5 Q. Where is this at?

6 A. Page 15. Third paragraph.

7 Q. Is this the third paragraph, the
8 paragraph that begins, "It needs to be noted that
9 not all . . ."

10 A. Yes.

11 Q. Okay.

12 A. There are a 1000 parameters you could
13 use to define any of these categories, and they are
14 still very generic and vague in nature. So high
15 altitude, is that 18,001 feet or is it 39,000 feet?
16 I don't have that definition.

17 Q. Now, in this instance, the high altitude
18 refers to Able to Avoid accidents that did not
19 include a Skull Valley-type event; correct?

20 A. That's what it says.

21 Q. Do you have any other example of how you
22 were somehow restricted or confined by what you
23 thought were the definitions in this part of the
24 report?

25 A. No, I do not.

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1 Q. Let me confer with my co-counsel for a
2 second, please.

3 (Discussion off the record.)

4 Q. Lieutenant Colonel Horstman, do you
5 remember stating in the first phase of the hearings
6 that we had the second week in April, that if you
7 just took all of the information on Table 1 and
8 without any of the categories in terms of Skull
9 Valley or Sevier B or Engine Failure, and just
10 looked at Able to Avoid, without breaking down the
11 categories further, I believe you said that 41
12 percent of the pilots would not have the ability to
13 control where the airplane would hit the earth.

14 A. I remember stating that, yes, I do.

15 Q. Now, that is looking at all 121
16 accidents in total; correct?

17 A. It is looking at the entire database.

18 Q. Right.

19 A. If it's 121, that is correct.

20 Q. I believe it is 121. And that entire
21 database includes accidents that would occur during
22 air-to-air combat training on the ranges; correct?

23 A. This is correct.

24 Q. And those type of accidents would not be
25 proper to include in the Skull Valley-type event

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1 since such type activity doesn't take place there;
2 correct?

3 A. That is correct.

4 Q. And similarly, other range-type
5 activities that would only occur on the range that
6 would not take place in Skull Valley, accidents
7 involving those type of activities would not be
8 proper to include as a Skull Valley-type event.

9 A. That is correct also, sir.

10 Q. I would like to go to a different topic.
11 The topic of weather. Now, in your prefiled
12 written testimony, particularly in Question and
13 Answer 56 --

14 A. What's the date of that?

15 Q. The prefiled written testimony. This is
16 the testimony that you filed. Do you have a copy
17 of that? February 19, 2002.

18 A. I do not. Connie, can I get that,
19 please? I'm sorry.

20 Q. The one thing we didn't supply. I
21 thought you would bring a copy of your own
22 testimony.

23 A. I did. But it's still over there.
24 Thank you. I have it. Which question, please?

25 Q. Specifically Question 56. Now, in

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1 general you claim that weather would be a major
2 factor on whether a pilot might be Able to Avoid
3 the PFS site; correct?

4 A. It's a mitigating factor.

5 Q. Mitigating? What -- I don't understand
6 the use of the word "mitigating".

7 A. I don't understand the use of the words
8 "major factor", if we are going to talk
9 definitions. I'm confused. It's a factor.

10 JUDGE FARRAR: Do you mean mitigating or
11 contributing?

12 LT. COL. HORSTMAN: If where we end up
13 is whether the pilot is going to be able to avoid
14 something based on whether I can see it, it is a
15 mitigating factor. Is it a major factor? If the
16 weather is not between the pilot and the ground
17 site, it's not. If it is, then it is. So I don't
18 know how to answer that question.

19 Q. (By Mr. Gaukler) And I was just asking
20 the question in a general sense. Not one
21 particular accident, but just in general.

22 A. It's a factor. Whether or not it is
23 major is debatable.

24 Q. In Question and Answer 56, you assert
25 that, "Annual data from Michael Army Air Force,

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1 show that there is cloud cover (greater than 50
2 percent) 43 percent of the time at or below 12,000
3 feet above ground level."

4 A. That's correct.

5 Q. And the State -- based on that
6 statement, the State claimed, at least in its
7 opposition to our motion for summary disposition,
8 that at least 46 percent of the time a pilot would
9 not be able to see the PFSF site in order to avoid
10 it; correct? In other words, they took that data
11 and Dr. Resnikoff used it to make that claim;
12 correct?

13 A. That's right.

14 Q. Do you believe that is a correct claim
15 to make, just based on that statement that at least
16 46 percent of the time a pilot would not be able to
17 see the PFS site in order to avoid the site?

18 A. Yes, I do. And let me explain it. The
19 FAA has decided, throughout years of history, that
20 if you have greater than 50 percent cloud cover,
21 that you cannot see through it. So if you are
22 going to file a flight plan to take off from Salt
23 Lake City and go to Dulles Airport in Washington,
24 D.C., if you had 51 percent of the sky covered, or
25 greater, in clouds, you would have to file for an

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1 alternate air base to land. You would be required
2 to carry extra fuel and file that portion of the
3 flight plan, also. The reason for that is that the
4 assumption is that if the sky is a broken ceiling,
5 that you will not be able to see the runway.

6 Q. Now, right here, this statement in
7 Question and Answer 56 says that 46 percent of the
8 time there would be a ceiling at or below 12,000
9 feet above ground level; correct?

10 A. That's what it says.

11 Q. And so, therefore, that would include a
12 situation where you would have a ceiling at 12,000
13 feet above ground level; correct?

14 A. That's correct.

15 Q. And 12,000 feet above ground level,
16 Sevier B in Skull Valley goes to approximately
17 about 5000 feet above ground level.

18 A. That's correct.

19 Q. And so, therefore, you could fly through
20 Sevier B below the clouds in that instance;
21 correct?

22 A. You could. If all of the weather was at
23 12,000 feet AGL.

24 Q. And in that instance, the cloud cover at
25 12,000 feet would not prevent a pilot from seeing

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1 the PFSF site; correct?

2 A. That's correct. Would have no impact.

3 Q. And you could fly anywhere up to the
4 cloud cover of 12,000 feet; say within -- there's a
5 limit, I know, you can't go too close. Something
6 like 500 or a 1000 feet, I forget. But he could
7 fly up to that limit?

8 A. That's correct.

9 Q. And still be able to see the PFS site?

10 A. That's correct.

11 Q. And the same token, if the cloud cover
12 is at 10,000 feet AGL, you could fly within 500 or
13 a 1000 feet of that and be able to see the PFS
14 site?

15 A. Yes, sir, that's correct, also.

16 Q. So just based on that information alone,
17 it's true to that you -- just taking this data and
18 saying that on the basis of this data that 46
19 percent of the time a pilot cannot avoid the site
20 because he can't see, it is incorrect; because
21 there could be a lot of situations in which the
22 pilot could be flying with a ceiling that meets
23 your definition as set forth in Question and Answer
24 56 and be able to see the site. Right?

25 A. We don't have that data. If the ceiling

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1 was always at a 1000 feet or always at 12,000 feet,
2 the data doesn't show it. And we are talking about
3 a ceiling. And the ceiling is generally made up of
4 different layers of cloud, as opposed to one cloud.
5 So it depends. And if you -- if the ceiling were
6 always at 12,000 feet and there was a layer at 2000
7 feet and it was a scattered layer, then you have a
8 very small probability of seeing the target at the
9 ground, as well. So we don't know. This is the
10 most conservative method I could find.

11 Q. Now, I asked you a question and I don't
12 think you have answered it.

13 Could you read the question back?

14 (The record was read as follows:

15 "So just based on that information
16 alone, it's true to that you -- just taking
17 this data and saying that on the basis of this
18 data that 46 percent of the time a pilot cannot
19 avoid the site because he can't see, it is
20 incorrect; because there could be a lot of
21 situations in which the pilot could be flying
22 with a ceiling that meets your definition as
23 set forth in Question and Answer 56 and be able
24 to see the site. Right?")

25 Q. I don't think you have answered my

1 question.

2 A. There are times that you'd be able to
3 see it. There's potentially 100 percent of the
4 time that you would not be able to see it. I'm not
5 a mathematician, so I don't know how to better
6 answer that.

7 Q. So it's not 100 percent, then? It's
8 less than 100 percent?

9 A. I didn't say that. It could be more,
10 depending on where that weather is.

11 Q. But you don't know?

12 A. That's correct.

13 Q. What's the definition of "scattered"?

14 A. A scattered deck is -- I could look it
15 up, but I believe it is 25 percent of the sky is
16 covered.

17 Q. And it's your position that that would
18 prevent a pilot from seeing the site and being able
19 to avoid the site? Is that what I heard you say a
20 second ago?

21 A. Yeah, I think it is appropriate to
22 discuss cloud cover and the visibility or the
23 pilot's capability to see the ground through clouds
24 and cloud cover. So what I'd like to do is
25 approach and to give a small demonstration of cloud

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1 cover over the ground, if I may.

2 JUDGE FARRAR: Move it away a little.

3 LT. COL. HORSTMAN: It's important that
4 it is here, and I'll move it back. I have a
5 notepad that is turned upside down and a bunch of
6 Scrabble tiles, which I will set out on top of the
7 note pad. It will take me a minute, so please bear
8 with me.

9 Thank you for being patient. If you
10 look at this depiction, the tiles represent clouds
11 as a typical nonsolid layer. A certain percentage
12 of the sky is covered with cloud and a certain
13 percent is not covered. If you can look down upon
14 it, standing up you can see a fairly significant
15 portion of the tablet underneath.

16 Now I'm going to ask you all to sit
17 down, and I'm going to move this back. From where
18 you are sitting, look at this tablet now. You have
19 about a ten degree grazing angle, visual angle, to
20 look at that tablet. And from where you were, you
21 can see that a significant portion, the vast
22 majority, I would say, of that tablet is not
23 visible. But the clouds are, because they have
24 vertical development and yet they are sporadic and
25 random in this example. And the question is, can a

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1 pilot see an object on the ground as he is moving
2 at approximately seven miles per minute? So if you
3 envision yourself moving, trying to find a
4 particular point on the ground, and if I were to
5 move this twenty feet, keep your eye on that part
6 of the tablet for the entire time it's being moved.
7 I would argue that you could not do that. It is
8 very difficult to see the ground looking out the
9 front of the airplane.

10 JUDGE LAM: So the basic argument is
11 visibility is related to the optical angle you are
12 looking at things?

13 LT. COL. HORSTMAN: In this case that is
14 correct. Now, instead of getting into a question
15 and answer period, I'm here to tell you that if I
16 had 100 percent more tiles covering that tablet, it
17 is still not a broken deck. It's not a ceiling.
18 That is a scattered deck. There's 25 percent of
19 that tablet covered with Scrabble tiles,
20 representing clouds. And as a pilot, if there's 25
21 percent of the sky covered, there's a very high
22 probability that I will not be able to see the
23 ground in front of me. Feel free to measure or
24 whatever. I measured them out. It's like 24 to 25
25 percent.

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1 JUDGE FARRAR: You are saying with the
2 numbers that are on the eight and a half by eleven
3 tablet, you are saying if we measured the area of
4 the tiles it would be less than --

5 LT. COL. HORSTMAN: It would be 25
6 percent, sir.

7 JUDGE FARRAR: Less than
8 ninety-something square inches.

9 LT. COL. HORSTMAN: And if we doubled
10 that, it would still be a scattered deck. So 100
11 percent more Scrabble tiles would still be a
12 scattered deck. Looking at it from the top, I can
13 see 75 percent of the earth. Looking at it from a
14 10-degree grazing angle, I can see a very small
15 portion. I don't know what that exact amount is,
16 and it depended on if you move one or the other.
17 And if I'm moving at seven miles a minute and I try
18 to keep a specific ground site, the clouds will
19 obscure me part of the way. And if I'm looking for
20 a target on the ground and I'm moving, I'm not ever
21 going to focus more than a couple brief seconds in
22 a moment, on the outside.

23 JUDGE LAM: Are you positive the area of
24 the Scrabble tiles are only 25 percent of the pad?

25 MS. MARCO: Let's find out.

1 LT. COL. HORSTMAN: The easiest way is
2 I'm going to destroy this in a moment, not yet.

3 (Discussion off the record.)

4 MR. TURK: You can just see how many go
5 in a line to fill up the side, and how many go that
6 way and count how many we have.

7 LT. COL. HORSTMAN: That's how I did it,
8 your Honor. Feel free. Any way you want.

9 (Discussion off the record.)

10 JUDGE FARRAR: We were off the record
11 for a while watching the demonstration, and then
12 the question came up about the exact area that the
13 Scrabble tiles were covering. People have been
14 commenting in a way that helped them, but the
15 reporter didn't necessarily get all of it. What we
16 are trying to do now is determine whether the 40
17 tiles, Scrabble tiles, that were on an eight and a
18 half by eleven pad do, in fact, add up to 25
19 percent or more or less. And we are stymied by the
20 lack of a small ruler or tape, in which case we
21 would be able to do this.

22 LT. COL. HORSTMAN: May I offer? One of
23 the attorneys has measured the horizontal and the
24 vertical, and says that the entire area is 163
25 tiles.

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1 MR. TURK: Here is a ruler. We measured
2 how many tiles it takes lined up in the horizontal
3 and vertical direction. It seems to take 14.2
4 tiles in the long direction, 11.5 tiles in the
5 horizontal direction. If you multiply 11.5 times
6 14.2, it calculates out to 163.3 tiles to fill the
7 pad.

8 JUDGE LAM: And how many tiles are
9 there?

10 JUDGE FARRAR: There's 40.

11 JUDGE LAM: So that is 25 percent.

12 LT. COL. HORSTMAN: Slightly less; 24
13 and a half, which is what I said originally, sir.

14 JUDGE KLINE: Good enough.

15 JUDGE FARRAR: Okay. The way in which
16 Mr. Turk did it sounds like the right way, laying
17 out the tiles.

18 MR. TURK: Another problem is they are
19 not exactly square tiles. They are rectangular.

20 JUDGE FARRAR: But the way you did it
21 took account of that. The way you did it, they
22 were on the same axis and it would say how many
23 would be on there. Measuring them and trying to
24 find the area of each tile introduces too much
25 error, because whether it is three-quarters or

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1 eleven-sixteenths, we would never be able to tell.

2 You came up with what, Mr. Turk?

3 MR. TURK: 163.3.

4 JUDGE FARRAR: And there were 40 tiles.

5 JUDGE LAM: Mr. Turk, you introduced a
6 great deal of precision into this process.

7 MR. TURK: It's not every day I can do
8 that.

9 Q. (By Mr. Gaukler) Lieutenant Colonel
10 Horstman, we have just been looking at your
11 example. Now, suppose the clouds were all together
12 in one group towards one side of the sky.

13 A. Okay.

14 Q. In a situation something like we have
15 grouped together on --

16 A. On that quadrant.

17 Q. Yes, sir. In that situation, 25 percent
18 most likely would not prevent you from seeing the
19 site; correctly?

20 A. If the site was underneath it, it would
21 absolutely prevent it. We don't know where it is.

22 Q. If the site were off to my left, it
23 would not.

24 A. That's correct. The purpose of the
25 illustration that I just did was to show you the

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1 difficulty to see a target on the ground with a
2 scattered deck, just a basic scattered deck at 25
3 percent. And if you remember how difficult it was
4 to see parts of the tablet, if we double the number
5 of Scrabble tiles, it is still not a broken deck.
6 It is 49 percent of the sky covered, and it takes
7 greater than 50 percent to be a ceiling or broken,
8 which constitutes a ceiling, or greater. Up to 100
9 percent. So as you are flying by, if 46 percent of
10 the time you have a ceiling and the ceiling is
11 generally made up of different layers and you have
12 a scattered deck underneath you at perhaps 2000 or
13 3000 feet or whatever, I don't think you can see
14 the target most of the time.

15 So to answer the question that I was
16 presented with is, it depends on a number of pieces
17 of information that we do not have. If I'm trying
18 to look out of my window and find that target, the
19 PFS site on the ground with -- in this example we
20 tend to use here is an engine failure. Let's say
21 with hydraulic failure or anything else, and the
22 aircraft is controllable, can I see on the ground
23 the PFS site? I would argue that it is virtually
24 impossible.

25 JUDGE FARRAR: Because for those

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1 purposes you are flying visually, unlike when you
2 are landing -- well, the same visual problem would
3 affect you when you are landing your Southwest
4 Airlines flight at Salt Lake or Baltimore. But you
5 have the instrument --

6 LT. COL. HORSTMAN: That's exactly
7 correct.

8 JUDGE FARRAR: The instruments and the
9 runway beacons and so forth.

10 LT. COL. HORSTMAN: Yes. And if there
11 is a 51 percent or greater sky cover, we are
12 required by FAA regulation to use those instead of
13 proceeding visually.

14 Q. (By Mr. Gaukler) Several things, and we
15 will come back to this, Lieutenant Colonel
16 Horstman. I would like to have handed out several
17 things. I'm going to hand out Exhibit 59, which is
18 the data itself. I'm going to hand out what I
19 believe is the FAA definition of the ceiling, et
20 cetera, and Mr. Vigeant's declaration or testimony.
21 Those will be most of the materials I'll be
22 referring to in the next portion of the
23 questioning, other than materials I previously
24 handed out.

25 JUDGE FARRAR: Mr. Gaukler, any of these

1 new exhibits?

2 MR. GAUKLER: The FAA order is quoted in
3 Mr. Vigeant's testimony, but I thought you may want
4 to see the actual document itself. So my intent is
5 not to introduce it into evidence, but just to hand
6 it out so you can see it.

7 JUDGE FARRAR: All right.

8 Q. Looking at State's Exhibit 59, this is
9 what you based your statement in your testimony on
10 in terms of the cloud cover of 46 percent, at
11 greater than 50 percent, 46 percent of the time?

12 A. That's correct, sir.

13 Q. And this is, I take it, it looks like a
14 printout from the Air Weather Service for Climatic
15 Brief for Dugway Proving Ground. Correct?

16 A. Yes, sir. I believe it's the same piece
17 of information that when Mr. Vigeant was on the
18 stand he used to explain the prevailing wind and
19 the wind direction at the airport.

20 Q. Now, this -- I see a number down on the
21 bottom, 12/9/09. I mean 12/9/00.

22 A. Yes.

23 Q. Is that the date you printed the
24 information off the internet?

25 A. It's the date I obtained it from the

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1 Hill Air Force Base weather station off the
2 internet.

3 Q. And that was December 9 of 2000 is the
4 date you obtained it?

5 A. I think so. It was in December.
6 Whether it was actually the 9th, I don't know.

7 Q. In that time frame, in any event?

8 A. That's correct.

9 Q. How do you reach the claim that this
10 shows that there is cloud cover greater than 50
11 percent, 46 percent of the time, at or below 12,000
12 feet?

13 A. The way it was explained to me by the
14 meteorologist was that the last line of "Sky Cover
15 Greater than 5/10" constitutes a ceiling and then
16 it has individual months and the annual of 46.3
17 percent.

18 Q. Now, for what time period is this?

19 A. It is historical.

20 Q. It is historical. So historical meaning
21 what?

22 A. It's got an hourly observation, period
23 of record, I believe is the term. I don't recall.
24 And those are up there.

25 Q. And how was this data collected? Do you

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1 know?

2 A. As it was explained to me by the
3 meteorologist, they collected it, automatically at
4 Michaels Air Field.

5 Q. Who was the meteorologist?

6 A. I don't remember her name. I used to
7 work with her. A female lieutenant at Hill Air
8 Force Base, 75th Operational Support Squad, Weather
9 Station.

10 Q. Do you have anything in writing
11 explaining this interpretation?

12 A. No, I do not.

13 Q. Did she provide you any documentation to
14 explain this interpretation?

15 A. She did not.

16 Q. Will you read on the top when this data
17 was collected?

18 A. 6005-7012, 7301-7606, 8401-9004.

19 Q. And that would be what, if you put that
20 in month and years?

21 A. Give me one second and I'll look that
22 up. The 6005 corresponds to May of 1960. So
23 that's the nomenclature.

24 Q. And the other dates are?

25 A. Well, that would be --

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1 JUDGE FARRAR: So the first two digits
2 are the year?

3 LT. COL. HORSTMAN: Yes, sir.

4 JUDGE FARRAR: And the second two digits
5 are the month?

6 LT. COL. HORSTMAN: Yes. And I can
7 decipher them, or you can read them. Your choice.

8 Q. (By Mr. Gaukler) So May, '60 through
9 December of 1970 was the first set?

10 A. That's correct.

11 Q. And January, 1973 through June, 1976 for
12 the second set? Is that correct?

13 A. That's correct.

14 Q. And January, 1984 through April, 1990
15 for the last set?

16 A. That's correct.

17 Q. Now, you've read Mr. Stephen Vigeant's
18 testimony; correct?

19 A. That's correct.

20 Q. And isn't this data that was prior to
21 the installation of an Automated Surface Observing
22 System?

23 A. Prior to ASOS there were other automated
24 systems out there.

25 Q. Isn't it true, based on as described --

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1 under ASOS -- you thought this data had been
2 collected under ASOS; correct?

3 A. That's how it was explained to me.

4 Q. It was also true, isn't it, that you
5 initially thought that this data was for the
6 calendar year December, 1999 through December,
7 2000. Correct?

8 A. That's how it was explained to me, sir.

9 Q. And that's what I asked you at the
10 deposition of July of 2000?

11 A. Yes, sir.

12 Q. And that's how you explained it;
13 correct?

14 A. I believe it was July, 2001. Yes.

15 Q. Now, who gave you these explanations?

16 A. The lieutenant at the weather station at
17 75th Operational Support Squad.

18 Q. And when was this given to you?

19 A. On or about the date in the lower
20 right-hand corner.

21 Q. And was it given in person, by phone?

22 A. It was given in person.

23 Q. And did this person print it off for you
24 then or not?

25 A. Yes, they did.

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1 Q. Do you have any notes of that
2 conversation or anything?

3 A. I do not.

4 Q. Now, I take it with Mr. Vigeant's
5 testimony you -- first of all, by virtue of the
6 fact that this was not collected by ASOS, the
7 ceiling is not up to 12,000 feet; correct?

8 A. I don't know that. If it is collected
9 by another type of automated system which they had
10 prior to 1992, I don't know that.

11 Q. Do you know what the ceiling would be if
12 it was collected prior to ASOS, as this was;
13 correct?

14 A. I'm not sure I understand the question,
15 I'm sorry.

16 Q. Do you know, based on Mr. Vigeant's
17 testimony, that the ASOS system came into effect
18 essentially in the 1992 time frame?

19 A. Yes, sir. Based on his testimony.

20 Q. And do you know that this data was
21 collected -- do you know whether this data was
22 collected by an Automated Surface Observing System?

23 A. By the ASOS?

24 Q. Yes.

25 A. By ASOS, based on what he says, no. No.

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1 I was explained by the weather forecaster that it
2 was "captured automated", and I don't know what
3 that means.

4 Q. And you also thought you were told by
5 the weather person that this was for the calendar
6 year December, 1999 through December, 2000.

7 Correct?

8 A. No. I said that that's what they
9 explained to me.

10 Q. That's what I said. "They", being the
11 meteorologist you spoke to, that's what you thought
12 she had told you; correct?

13 A. Can you rephrase that, please?

14 Q. Sure. The meteorologist that you spoke
15 to, to your understanding, you believe that she
16 told you that this data was for the period
17 December, 1999 through December, 2000; correct?

18 A. That's correct.

19 Q. And I take it you didn't know that this
20 data was of a different date until you saw Mr.
21 Vigeant's testimony?

22 A. That's correct.

23 Q. Now, isn't it true that you actually
24 were presented with information prior to Mr.
25 Vigeant's testimony that showed that this was not

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1 the correct time frame; the December, 1999 through
2 December, 2000 was not the correct time frame?

3 A. I don't specifically recall.

4 Q. I'd like to hand out, very quickly -- do
5 you recognize this as an excerpt from the
6 declaration of James Cole, Wayne Jefferson, and Ron
7 Fly that was filed in support of PFS's motion for
8 summary disposition?

9 A. I do recognize it.

10 Q. And that was filed late December, 2000?
11 Take my word for it.

12 A. Okay, I'll take your word for it.

13 Q. I know when it was filed. And this is
14 your declaration that you talked about earlier
15 dated January 30, 2001; it was based upon your
16 response in review to this declaration. Correct?

17 A. That's correct.

18 Q. So you reviewed this declaration
19 closely, I take it?

20 A. Right.

21 Q. Now, isn't it true that in Paragraph 97
22 on Pages 39 and 40, doesn't that give a summary of
23 the same information that was in Mr. Vigeant's
24 testimony concerning the nature of this data?

25 A. It does.

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1 Q. And this was approximately seventeen
2 months before your deposition in July of 2001.

3 A. That's correct.

4 Q. Where you told me this data was from
5 December, 1999 through December, 2000?

6 A. That's correct.

7 Q. Did you make any independent effort
8 yourself to confirm the nature of the data that you
9 had received from the meteorologist at the Hill Air
10 Force Base?

11 A. No, I did not.

12 Q. And so you, yourself, don't know, for
13 example, what height the ceiling that is
14 represented in this bottom line, greater than
15 5/10ths 46-percent of the time, you don't know what
16 height that ceiling was, independently?

17 A. No. It was explained to me that it was
18 12,000 feet or below.

19 Q. But you don't know that as a fact
20 yourself?

21 A. No, I do not.

22 Q. And you don't know whether the cloud
23 cover here that is reported in that line as part of
24 that percentage, 46.3 percent over that entire
25 year, you don't know whether that percentage

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1 includes transparent clouds as well as opaque
2 clouds; do you?

3 A. No. And I have given that a lot of
4 thought. And it's --

5 Q. First of all, your answer is you don't
6 know?

7 A. That's correct.

8 Q. You don't know whether it does or does
9 not include that?

10 A. I do not know.

11 Q. Okay. Fine. We may get to the other
12 topic later, but right now I just want to focus on
13 what you know and what you don't.

14 A. That's fine.

15 Q. Now, you say in Question and Answer 57,
16 you talk about the ceiling for the FAA. And I
17 think you referred to it, in connection with some
18 of the answers that you gave previously, being 50
19 percent. Isn't it true that the FAA defines a
20 ceiling as cloud cover greater than 50 percent?

21 A. Yes, it is.

22 Q. And, therefore, your saying that it is
23 50 percent is not the correct definition of the
24 FAA; correct?

25 A. In my previous testimony I said greater

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1 than 50 percent. In this one I said 50 percent.

2 Q. So the sentence on -- well, the sentence
3 on Question and Answer 57 where you say, "The FAA
4 defines a cloud ceiling at 50 percent cloud cover,"
5 that is not a correct statement then, is it?

6 A. It is incorrect. It is greater than.

7 Q. Now, if you looked at the FAA
8 definition -- first of all, I'd like to have you
9 take a look at the document that I handed out.
10 It's Order 7900.5(b).

11 A. I have that.

12 Q. Do you recognize this as the FAA order?

13 A. Yes.

14 Q. Have you seen this before?

15 A. This particular one, no. I have seen
16 most of what is encapsulated in it before.

17 Q. I missed the answer.

18 A. I have not seen this particular document
19 before, but I have seen most of the information
20 inside of it before.

21 Q. Now, if you looked under Chapter 12, Sky
22 Conditions, Section 2, Definitions. And there it
23 has 12-4 Ceiling.

24 A. I see that.

25 Q. And could you read that definition into

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1 the record, please.

2 A. The ceiling is the height above the
3 earth's surface, field elevation or ground
4 elevation, described to the lowest nonsurface based
5 layer that is reported broken or overcast where the
6 vertical visibility enters a surface-based
7 obscuration that totally hides the sky.

8 Q. And so it refers to a ceiling
9 constituting broken or overcast sky conditions?

10 A. That's correct.

11 Q. Now, would you go back and look at and
12 tell me what the definitions of broken and overcast
13 are? And I believe that they appear on Pages 3 of
14 4 of this section.

15 A. Broken represents sky cover of 5/8ths up
16 to but not including 8/8ths at and below the level
17 of the layer aloft.

18 Q. Would you read overcast?

19 A. Sky cover of 8/8ths at and below the
20 level of a layer aloft.

21 Q. So therefore, to reach a ceiling under
22 the FAA definition, it really comes to 62.5
23 percent; isn't that correct?

24 A. Well, I'm not -- I don't know how to
25 measure four-and-a-half eighths. My understanding

1 is when you go from 4/8ths, which is 50 percent, if
2 it is greater then it becomes 5/8ths. So how they
3 do the interpretation, I don't know.

4 Q. But the measurement that the FAA has
5 defines ceiling as a nonsurface area that is
6 reported broken or overcast; correct? And broken
7 is 62.5 percent or more; correct?

8 A. That's correct. And there's one-eighth
9 in there that is missing by definition. The 4/8ths
10 to 5/8ths is not defined anywhere. So whether it
11 is broken or scattered is not defined.

12 Q. But broken is clearly defined; correct?

13 A. Broken is clearly defined.

14 Q. And ceiling is clearly defined in terms
15 of broken and overcast; correct?

16 A. That's correct.

17 Q. And what is the minimum -- and
18 scattered, would you please read what is the
19 definition for scattered on Page 304.

20 A. Sky cover of 3/8ths to 4/8ths at and
21 below the level of a layer aloft.

22 Q. And so when you talk about at or below a
23 layer of a level aloft, it's as you go up and it's
24 the first level that you would reach something for,
25 say, 3/8ths to 4/8ths that you would have scattered

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1 cloud cover?

2 A. Yes. I think I understand what you are
3 saying and I agree, yes.

4 Q. And 3/8ths equals 37.5 percent?

5 A. That's correct.

6 Q. Now, you claim in Question and Answer 57
7 that National Weather Service data is not certified
8 by the Federal Aviation Administration. I take it
9 that really doesn't mean anything here, since we
10 have data from the same source that you use, Air
11 Weather Service; correct?

12 A. There are many weather stations which
13 provide joint weather. Some do not.

14 Q. That wasn't the question. I guess the
15 question is do you agree that our data is from the
16 Air Weather Service? That is referred to in Mr.
17 Vigeant's testimony.

18 A. I will have to look. I don't know.

19 Q. If you look at Question and Answer 8 of
20 his testimony.

21 MR. SOPER: I'd like to object to the
22 form of the question. He is asking this witness to
23 characterize another witness's testimony, and
24 there's exhibits to the testimony and so forth.
25 I'm not sure that he has any basis to answer this

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1 question.

2 MR. GAUKLER: I can rephrase the
3 question and it will take care of it.

4 JUDGE FARRAR: Let's do that instead.

5 Q. (By Mr. Gaukler) Is it your
6 understanding, from reviewing Mr. Vigeant's
7 testimony, that his data comes from the Air Weather
8 Service, also?

9 A. It is.

10 Q. And so it's the same source as your data
11 comes from; correct?

12 A. I believe so, yes.

13 Q. And, therefore, any relevance -- this
14 reference to the National Weather Data, whether
15 correct or wrong or whatever, it is irrelevant for
16 purposes of this evaluation; correct?

17 A. For the purposes of our conversation
18 now, that's correct.

19 Q. Now, Question and Answer 58 of your
20 testimony, you're talking about some data which
21 shows that 96 percent of the time UPT pilot has
22 weather of at least a 3000 foot ceiling and three
23 miles of visibility; correct?

24 A. That's correct.

25 Q. And you say, in the third sentence, if I

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1 can count, if I can improve lawyers' counting,
2 essentially, a ceiling of 3000 feet 96 percent of
3 the time only insures that a pilot flying under
4 3000 feet above ground level would not encounter
5 cloud cover four percent of the time. Is that a
6 correct sentence?

7 A. No, it is not. It should be would
8 encounter cloud cover 4 percent of the time.

9 Q. Isn't it, "Would not encounter cloud
10 cover 96 percent of the time," instead of 4 percent
11 of the time? At least cloud cover constituting the
12 ceiling?

13 A. Four percent of the time you would have
14 clouds; 96 percent of time you would not have
15 clouds at those parameters.

16 Q. Okay. So you would take out the "not".
17 "Would encounter cloud cover 4 percent of the
18 time."

19 A. That's correct.

20 Q. So that sentence is incorrect as
21 written?

22 A. Yes, it is.

23 Q. And you would take out the "not", so it
24 would read, "Essentially a ceiling of at least 3000
25 feet 96 percent of the time only insures that a

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1 pilot flying under 3000 feet above ground level
2 would encounter cloud cover 4 percent of the time."

3 A. That's correct.

4 JUDGE FARRAR: Mr. Gaukler, how much
5 longer do you have on this subject?

6 MR. GAUKLER: Probably have about ten
7 minutes.

8 JUDGE FARRAR: Why don't we finish this
9 subject and call it a day.

10 Q. (By Mr. Gaukler) You say in Questions
11 55 and 58, I believe it is, that flying below a
12 cloud cover may force a pilot to eject immediately.

13 A. It can, yes.

14 Q. If you were to take your example,
15 suppose you are flying at, say -- first of all, you
16 say 3000 feet. You have said before in your
17 testimony 3000 feet is the most commonly or is what
18 F-16s most commonly transit Skull Valley at.

19 A. No, I don't believe I said that. I said
20 I believe there are a variety of altitudes.
21 Colonel McFarland gave you that testimony.

22 Q. Didn't you, in your testimony --

23 A. It's a common altitude.

24 Q. Most common?

25 A. I don't believe I used those words, but

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1 it is a common altitude.

2 Q. I'd like to have you go back to Question
3 and Answer --

4 MS. MARCO: 25?

5 Q. Yes. Question 25. "At what altitudes
6 do F-16s fly through Skull Valley?" You say,
7 "F-16s most commonly fly through Skull Valley at
8 3000 feet AGL in the Sevier B MOA, but may fly
9 above the Sevier B MOA up to 18,000 feet AGL." Do
10 you see that?

11 A. I do. Fair enough.

12 Q. Suppose you are flying at 3000 feet and
13 the cloud cover is above you at 4000 feet or 3500
14 feet, which would be permissible; correct?

15 A. That's correct.

16 Q. And suppose you were flying at a typical
17 speed you may fly, 425 knots.

18 A. Fair enough.

19 Q. You would have -- how much time would
20 you be able to hold your altitude and coast down --
21 how much time would you have holding your altitude
22 without zooming and get to a glide speed of 200 to
23 225 knots?

24 A. Let me look it up. The charts don't
25 indicate, because they are all designed for a zoom.

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1 So I can't provide you with a specific answer.

2 Q. You can't. Okay. Can you give me an
3 approximate answer?

4 A. Very brief period of time.

5 Q. And by that do you mean one second, ten
6 seconds, twenty seconds?

7 A. It's longer than one second.

8 Q. Longer than ten?

9 A. I'm clarifying. Stick with me.

10 JUDGE FARRAR: Mr. Gaukler, this
11 question is at 3000 feet, losing an engine?

12 MR. GAUKLER: Yes. And cloud cover at
13 3500 feet, so he couldn't zoom.

14 JUDGE FARRAR: He is not going to zoom
15 because he has cloud cover. 16 t squared?

16 LT. COL. HORSTMAN: I don't know the
17 answer.

18 JUDGE FARRAR: Would 15 seconds sound
19 reasonable?

20 LT. COL. HORSTMAN: It sounds reasonable
21 but --

22 Q. JUDGE FARRAR: All you are doing now is
23 gravity, right? You have lost your engine. You
24 are not heading up and so you are just going -- oh,
25 no. I'm sorry. You are a plane. You are gliding.

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1 Q. (By Mr. Gaukler) You have deceleration.
2 And deceleration from the drag going from 425 knots
3 down to roughly 200 knots.

4 A. And it also depends on the aircraft
5 configuration; whether you are carrying external
6 fuel, external stores because that increases the
7 drag index from as low as 25 units up to 200 to 250
8 units. And if you are carrying lots of external
9 stores, you will slow down a lot faster. So
10 there's a range and I don't know the exact answer.
11 It would depend if your engine is seized and is now
12 like a barn door or whether air is flowing through
13 the engine. There are some other parameters.

14 Q. And if you have jettisoned your
15 ordinance, that one factor would not apply.
16 Correct?

17 A. That is not completely true. You still
18 have potentially two missiles, an electronic combat
19 measure pod, a navigation pod, a target pod. So
20 you would still have a hundred units of drag or so.

21 Q. But you don't have the ordinance?

22 A. No. If you lost your engine, you would
23 jettison your ordinance. That's correct.

24 JUDGE FARRAR: Is there a point at which
25 your air speed gets so low that you stop gliding

1 and you plummet?

2 LT. COL. HORSTMAN: Well, yes. But the
3 computer won't let you get to that air speed. It
4 will begin a gradual descent. So what would
5 happen, sir, is if you are at 2000 feet, just to
6 use that as an example, when you hit your air speed
7 of 220 knots, you can't descend so when you get to
8 your ejection air speed you would just eject. So
9 does that help?

10 JUDGE FARRAR: Yes.

11 Q. (By Mr. Gaukler) I may have some kind
12 of clean-up questions on this, but I'm essentially
13 done with this part.

14 JUDGE FARRAR: Okay, then. We should
15 break. But what is our goal with this witness?
16 You have to leave this building when? Let me get
17 this information. When do you have to leave the
18 building Wednesday?

19 LT. COL. HORSTMAN: I have to fly to
20 Dallas Wednesday morning.

21 JUDGE FARRAR: So what time do you have
22 to leave here?

23 LT. COL. HORSTMAN: I'm supposed to be
24 at the airport at 5:30 Wednesday morning.

25 JUDGE LAM: 5:30 p.m. or a.m.?

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1 LT. COL. HORSTMAN: 5:30 a.m. Thank
2 you.

3 JUDGE FARRAR: Okay. So we have to
4 finish this witness tomorrow. Mr. Gaukler, how
5 much more do you think you'll have?

6 MR. GAUKLER: Approximately halfway
7 through.

8 JUDGE FARRAR: All right. Ms. Marco,
9 are you going to have a lot?

10 MS. MARCO: No, we don't have a lot.

11 LT. COL. HORSTMAN: Your Honor, I will
12 call our company and see if they can slip in -- I
13 have an annual flight check every two years.
14 That's this week.

15 JUDGE FARRAR: I rather -- see if you do
16 that, the lawyers will hear that and they will take
17 longer.

18 LT. COL. HORSTMAN: I understand. Thank
19 you very much, sir.

20 JUDGE FARRAR: So we reject your offer.
21 Mr. Soper, how much redirect will you
22 have?

23 MR. SOPER: Based on the questions so
24 far, very little.

25 JUDGE FARRAR: All right. Then we are

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1 in decent shape. Let's recess for the evening and
2 see you back here at nine o'clock tomorrow morning.

3 MR. TURK: May I ask a question on
4 schedule? Is it the Applicant's attempt to do
5 aircraft on Thursday or going back to seismic
6 Thursday?

7 JUDGE FARRAR: All I know is we will
8 have Colonel Horstman tomorrow. What are we doing
9 Wednesday? Resnikoff?

10 MR. SOPER: Resnikoff, is my
11 understanding.

12 JUDGE FARRAR: And how long will he be?

13 MR. GAUKLER: We have rebuttal, I don't
14 know if we can get through rebuttal while we have
15 Lieutenant Colonel Horstman.

16 JUDGE FARRAR: You mean a rebuttal
17 witness?

18 MR. GAUKLER: Rebuttal to his testimony
19 by our people.

20 MS. MARCO: The Staff has rebuttal, too.

21 JUDGE FARRAR: And you are going to do
22 that before we do Resnikoff?

23 MR. GAUKLER: Yes. That had been our
24 plan.

25 MR. SILBERG: I'm not sure it matters.

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1 JUDGE FARRAR: What matters, Mr.
2 Silberg, is the Board's preparation. We have to
3 know what you are planning.

4 MR. GAUKLER: The original understanding
5 was that we would get the aircraft first thing this
6 afternoon and have until approximately Wednesday
7 noon to complete Lieutenant Colonel Horstman, and
8 we were going to pick up Dr. Resnikoff. That's
9 what the State and I had discussed and agreed upon
10 with the conference with your Honor that evening
11 when we all sat here.

12 JUDGE FARRAR: But I'm hearing different
13 things. After Colonel Horstman tomorrow, what will
14 we do? Are we doing your rebuttal on Wednesday or
15 Resnikoff on Wednesday? I have heard I think two
16 different things here.

17 MR. SOPER: What I was thinking was that
18 any rebuttal, I'm not sure what the rebuttal is
19 that they have planned, but I was assuming that it
20 would be something we could also do tomorrow.

21 JUDGE FARRAR: Could be. All I'm
22 asking, it's a simple question. Have you all
23 agreed that you are doing rebuttal of this witness
24 before we hear Resnikoff?

25 MR. GAUKLER: That was the idea. And we

1 would have until Wednesday noon to complete that.
2 I don't know if we can complete that with the
3 witness leaving, is all I'm saying.

4 JUDGE FARRAR: Oh, he needs to be here
5 with you when they do rebuttal?

6 MR. SOPER: Yes.

7 JUDGE FARRAR: Okay. That was the
8 missing piece.

9 MR. SOPER: Colonel Horstman does, yes.

10 MR. TURK: And my last question was so
11 what do we do Thursday? Are we still doing
12 aircraft Thursday or seismic again? Does anyone
13 have a sense of it? Are you doing anything with
14 respect to Resnikoff? Do you have your own witness
15 or rebuttal on aircraft?

16 MR. BARNETT: We may have rebuttal with
17 respect to Dr. Resnikoff's testimony. I don't
18 think it will be very long.

19 JUDGE FARRAR: And who would that
20 witness be?

21 MR. BARNETT: Those would be among our
22 panel.

23 JUDGE FARRAR: Same witnesses?

24 MR. BARNETT: Yes.

25 JUDGE LAM: Mr. Turk, our preference is

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1 to finish aircraft assessment so we don't --

2 MR. TURK: Whatever your preference is.
3 I'm just trying to figure out in terms of my
4 people's flights home.

5 JUDGE LAM: There's a rationale
6 finishing aircraft so we don't have to take all
7 these back home and back here on June 3.

8 MR. TURK: I share your thought.

9 MR. GAUKLER: If we were to go beyond
10 this week, aircraft would probably end up in D. C.

11 JUDGE FARRAR: And we are going to
12 finish aircraft. On Friday what seismic witness
13 would we have?

14 MR. TURK: We had talked about having
15 Drs. Arabasz and Lewis. But the State may want to
16 complete the Ostadan/Bartlett testimony, which I'm
17 agreeable to do. Not that I'm waiting for the
18 Applicant to tell me what their preference is.

19 JUDGE FARRAR: Start working on what we
20 are going to get done Friday. I think we have made
21 as much progress as we can. Thank you. See you
22 tomorrow.

23 MR. GAUKLER: Again, I express concern
24 getting our rebuttal done.

25 JUDGE FARRAR: Go faster.

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(The proceeding was concluded

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for the day at 5:42 p.m.)

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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: Private Fuel Storage, LLC

Docket Number: Docket No. 72-22-ISFSI

ASLBP No. 97-732-02-ISFSI

Location: Salt Lake City, Utah

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.

15/ Diana Kent
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