

# Official Transcript of Proceedings

## NUCLEAR REGULATORY COMMISSION

Title: South Texas Project Units 3 and 4  
Hearing

DOCKETED

August 25, 2011 (10:30 a.m.)

Docket Number: 52-012-COL and 52-013-COI

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Date: Thursday, August 18, 2011

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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ATOMIC SAFETY AND LICENSING BOARD PANEL

HEARING

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IN THE MATTER OF	Docket Nos.
NUCLEAR INNOVATION NORTH	52012-COL
AMERICA, LLC (NINA)	52013-COL
(South Texas Project	ASLBP No.
Units 3 and 4)	09-88508-COL-BD01

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Thursday, August 18, 2011

Room 201

Building E

Texas Commission on

Environmental Quality

12100 Park 35 Circle

Austin, Texas

9:30 a.m.

BEFORE:

MICHAEL M. GIBSON, Chairman

GARY S. ARNOLD, Administrative Judge

RANDALL J. CHARBENEAU, Administrative Judge

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P R O C E E D I N G S

JUDGE GIBSON: Good morning. We are here today on Atomic Safety and Licensing Board Panel Docket Numbers 52-12-COL and 52-13-COL. These concern the United States Nuclear Regulatory Commission's proposed issuance of combined operating licenses to Nuclear Innovation North America, LLC, for the construction of two nuclear power plants in Matagorda County and, as we learned yesterday, for the operation by STPNOC of those reactors.

First let me introduce the board that will be conducting this evidentiary hearing. To my right, Judge Gary Arnold, who holds a PhD in nuclear engineering and is a full-time judge with the Atomic Safety and Licensing Board Panel.

To my left, Judge Randy Charbeneau, who holds a PhD in civil engineering and is both a part-time judge with the Atomic Safety and Licensing Board Panel and a full-time professor at the University of Texas.

I am Michael Gibson, a full-time judge with the Atomic Safety and Licensing Board Panel. I'm also a lawyer, and I am the chairman of this board.

And now I would like to have announcements of counsel, beginning with the Applicant.

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1 MR. FRANTZ: This is Steve Frantz,  
2 representing Nuclear Innovation North America. To my  
3 right is Stephen Burdick, and to his right is Chip  
4 Moldenhauer.

5 JUDGE GIBSON: Thank you.

6 Staff?

7 MR. SPENCER: Your Honor, I'm Michael  
8 Spencer. I'm representing the NRC staff. To my  
9 right is Andrea Silvia, and to my left is Anita Ghosh.

10 JUDGE GIBSON: Thank you.

11 Intervenor.

12 MR. EYE: May it please the panel. The  
13 Intervenor are here by counsel, Robert Eye and Brett  
14 Jarmer.

15 JUDGE GIBSON: Thank you.

16 Next I would like to introduce the board's  
17 administrative staff who will be working to assist us  
18 with this evidentiary hearing.

19 First, on the far right here, is a lawyer,  
20 Jon Esser. He is starting his second and final year  
21 as one of our law clerks.

22 Next is Karen Valloch, at the back of the  
23 room there. Karen is our administrative assistant,  
24 and she's been handling all the arrangements here, and  
25 we're very appreciative for what she's done.

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1 Our IT coordinator, sitting directly below  
2 me, is Andrew Welkie. We also have our court reporter  
3 here, Penny Bynum, and we also have our -- Victor  
4 Dricks, who's with the Office of Public Affairs and is  
5 handling any press or citizen inquiries, so if you  
6 have anything -- hold your hand up, Vic, in case  
7 anyone needs to consult with him.

8 Finally, I would be remiss if I did not  
9 acknowledge the incredible hospitality that we've  
10 received from the Texas Commission on Environmental  
11 Quality, which has graciously provided us with this  
12 beautiful hearing room for this hearing, as well as  
13 for the conference room that we had yesterday.

14 Hopefully we can all be mindful of that  
15 and take very good care of all this equipment and, as  
16 I might remind you, be sure and don't move those two  
17 tables at the back there.

18 One more thing: To the extent that anyone  
19 has their cell phone with them, please be sure it's  
20 off or on vibrate or something so it won't interrupt  
21 our proceedings. If you need to use your phone,  
22 please do so outside as a courtesy to the participants  
23 here.

24 To provide some context for our hearing  
25 today, we are here because Nuclear Innovation North

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1 America cannot proceed with its planned construction  
2 of two proposed nuclear reactors in Matagorda County  
3 until it has secured combined operating licenses from  
4 the United States Nuclear Regulatory Commission.

5 Today and tomorrow this board will conduct  
6 an evidentiary hearing on whether the United States  
7 Nuclear Regulatory Commission, which is proposed to  
8 issue these combined operating licenses, may do so  
9 consistent with the Atomic Energy Act, the National  
10 Environmental Policy Act, and the regulations that  
11 implement both of these statutes.

12 Nuclear Innovation North America, which  
13 we'll be referring to as NINA for short, is proposing  
14 to locate these two planned nuclear reactors on a site  
15 that currently houses two existing nuclear reactors.

16 The two existing reactors will be referred  
17 to as Units 1 and 2, and the proposed reactors will be  
18 referred to as Units 3 and 4.

19 As planned, proposed Units 3 and 4 would  
20 employ the advanced boiling water reactor design.  
21 This is significant because, after spending several  
22 years evaluating the advanced boiling water reactor  
23 design, the United States Nuclear Regulatory  
24 Commission certified this design as safe.

25 Consequently, all of the safety issues

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1 that relate to the advanced boiling water reactor  
2 design have already been resolved by the Commission's  
3 certification of this design, and so those issues are  
4 beyond the permissible scope of this proceeding.

5 On April 21, 2009, three organizations --  
6 the Sustainable Energy and Economic Development  
7 Coalition, the South Texas Association for Responsible  
8 Energy, and Public Citizen -- jointly filed a petition  
9 to intervene in this licensing proceeding.

10 In their petition these three groups  
11 challenged several environmental aspects of the  
12 planned construction and operation of planned Units 3  
13 and 4.

14 On August 27 of 2009, this board ruled  
15 that these three groups had standing to proceed with  
16 their challenge to the license application and that  
17 they had properly pleaded admissible contentions in  
18 accordance with the Nuclear Regulatory Commission  
19 rules. For the sake of brevity, we will refer to  
20 these three groups as Intervenors.

21 Now, after we issued the August 2009  
22 order, a lot of things happened in this case. This  
23 board issued several additional orders, held several  
24 additional oral arguments. The Nuclear Regulatory  
25 Commission resolved appeals from some of those -- the

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1 orders that we issued.

2 NINA amended its application and mooted  
3 some of the Intervenor's contentions by those  
4 amendments. The Nuclear Regulatory Commission staff  
5 issued an Environmental Impact Statement on this  
6 proposed license, and the Intervenor filed additional  
7 new and amended contentions to challenge this project.

8 Frankly, however, that's mostly inside  
9 baseball for purposes of why we're here today, because  
10 there's not much we could gain from dwelling on the  
11 denials -- the details of that procedural history.

12 The larger point is that there's currently  
13 only three matters that are before this board. One of  
14 these matters is the Intervenor's recently-filed  
15 contention challenging whether there is improper  
16 foreign ownership, domination, and control of these  
17 two planned reactors.

18 Yesterday, in Building F, we held oral  
19 argument on that contention, and we will not be  
20 addressing it during this evidentiary hearing today or  
21 tomorrow.

22 The other two remaining matters are two  
23 environmental contentions that Intervenor has  
24 raised. The first of these concerns whether NINA  
25 properly estimated replacement power costs as part of

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1 its evaluation of severe accident mitigation design  
2 alternatives in its environmental report.

3 The Intervenor's second contention concerns  
4 whether the Nuclear Regulatory Commission staff  
5 properly accounted for energy-efficient building code  
6 rules in its assessment of whether there is a  
7 sufficient need for power to justify going forward  
8 with these two nuclear reactors.

9 It is these two environmental contentions  
10 that we will address in our evidentiary hearing today  
11 and tomorrow.

12 As we have noted in previous orders, these  
13 proceedings over the next two days will be governed by  
14 10 Code of Federal Regulations Part 2, Subpart L.  
15 These proceedings will develop a record for this  
16 board's decision on these two contentions.

17 That record will consist of written  
18 testimony and whatever documentary evidence we admit,  
19 as well as the answers to questions that the board  
20 members may pose to each party's witnesses.

21 Before we proceed with the case, it might  
22 be useful to explain the differing roles of the  
23 Nuclear Regulatory Commission personnel here.

24 The Atomic Energy Act established the  
25 Nuclear Regulatory Commission to regulate nuclear

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1 facilities in this country. The Nuclear Regulatory  
2 Commission is headed by five commissioners who are  
3 appointed by the President and confirmed by the United  
4 States Senate.

5 The Commissioners have a large staff  
6 working for them. During this proceeding we will  
7 refer to them as the NRC staff or sometimes as the  
8 staff. The NRC staff is represented here today with  
9 lawyers and with technical people who have spent a  
10 great deal of time working on this application.

11 That brings us back to this Atomic Safety  
12 and Licensing Board. Although the Atomic Safety and  
13 Licensing Board is physically housed within the  
14 Nuclear Regulatory Commission and although individual  
15 judges receive their appointments from the  
16 commissioners of the Nuclear Regulatory Commission, we  
17 are an independent entity, and we are separate and  
18 apart from the NRC staff.

19 The staff appears here as one of the three  
20 parties and will represent its side in this dispute.  
21 And as three independent judges, we will consider the  
22 views of the NRC staff, just as we will consider those  
23 of NINA, the Applicant, and of the Intervenors, and we  
24 will accord each side equal weight.

25 If one of the three parties here does not

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1 agree with the ruling that we ultimately make after  
2 this hearing, that party can appeal our initial  
3 decision to the commissioners.

4 Now, I should emphasize that this hearing  
5 today is essentially a trial. This board will be  
6 receiving evidence in the form of exhibits and  
7 testimony from sworn witnesses for the three parties  
8 who are here before us.

9 This board and the counsel and the  
10 witnesses for the three parties to this proceeding,  
11 who are sitting here at the front of the room, will be  
12 the only people who will have speaking parts at this  
13 proceeding.

14 If you came here to talk about your  
15 concerns with these proposed nuclear reactors, I'm  
16 sorry, but this is not the forum for that.

17 However, under 10 CFR 2.328, this hearing  
18 is open to the public, and so those of you in the  
19 audience are certainly welcome to be here and to be at  
20 the proceedings, and we are appreciative for your  
21 attendance.

22 In addition, you should know that Section  
23 2.315(a) of Title 10 of the Code of Federal  
24 Regulations authorizes members of the public who are  
25 not represented here today to provide this board with

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1 written statements, so-called limited-appearance  
2 statements, expressing their views on the proposed  
3 construction and operation of these planned nuclear  
4 reactor in Matagorda County.

5 All of those limited-appearance statements  
6 will be transcribed and will be placed into the  
7 official docket of this proceeding. Although limited-  
8 appearance statements are not evidence, they may  
9 assist the board and the parties as this licensing  
10 process goes forward.

11 I should also note today that we will be  
12 utilizing some technology in the hearing room that  
13 will, I hope, enable the board and the parties to  
14 conduct this proceeding more efficiently. Only time  
15 will tell. However, I want to apologize in advance  
16 for any bugs that we may have not yet worked out with  
17 the system.

18 The Atomic Safety and Licensing Board  
19 Panel used this technology for the first time in the  
20 Vogtle early-site permit proceeding in March of 2009,  
21 and it has used it several times since, although this  
22 is the first time that these three board members have  
23 attempted to use it in an evidentiary hearing.

24 The Digital Data Management System, which  
25 is called DDMS for short, is our attempt to digitize

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1 the documentary record of an evidentiary hearing and  
2 make it accessible and usable in a courtroom setting.

3 One of the things that we'll be doing with  
4 the DDMS during this proceeding is marking the  
5 parties' exhibits electronically rather than using an  
6 ink stamp or labels, as is customary in most judicial  
7 hearings. This may involve some interchange between  
8 the board and Mr. Andrew Welkie, whom we've previously  
9 introduced as a member of our panel's IT staff.

10 Once the exhibits are marked, they will be  
11 transmitted electronically to the electronic hearing  
12 docket of the Nuclear Regulatory Commission, thus  
13 keeping the process entirely electronic from start to  
14 finish.

15 In addition, as I noted, we'll be  
16 transcribing this proceeding, and at the conclusion of  
17 it, we will establish a mechanism for the parties to  
18 correct the transcript of any errors.

19 Further, we anticipate using display  
20 technology as part of our evidentiary demonstrations.  
21 You see we have a screen here to the left of me, and  
22 to your right, and as well a television set out there.  
23 So hopefully everyone will be able to see what we're  
24 doing. Hopefully this will make the information more  
25 accessible and understandable.

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1                   Finally, there's a couple of minor  
2 housekeeping matters. First of all, we're planning to  
3 be able to conclude this proceeding before the end of  
4 the day tomorrow.

5                   Second, this proceeding will be a little  
6 different from most trials that you may have seen or  
7 participated in as a juror or counsel. Perhaps the  
8 most unusual aspect of a Subpart L proceeding is that  
9 the attorneys for the parties will not be questioning  
10 the witnesses. Instead the board members will be  
11 questioning the witnesses.

12                   These witnesses for the parties have  
13 already prefiled their testimony, and so the questions  
14 the board will be asking are based on that prefiled  
15 testimony.

16                   Many of the board's questions will be  
17 based on suggested questions that the parties have  
18 provided to the board through in-camera submissions.  
19 Although the board will be asking questions of the  
20 witnesses, once we've completed our examination of an  
21 individual witness, we will take a 15-minute break --  
22 is that what we agreed on yesterday the pretrial? I  
23 believe.

24                   We will be taking a 15-minute break after  
25 the we've finished examining the witness and allow the

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1 parties an opportunity to suggest -- write up  
2 additional questions that they would like us to ask  
3 that we did not cover in our examination. We will  
4 then come back and will attempt to ask those questions  
5 of the witness.

6 One thing to keep in mind as this hearing  
7 proceeds is to realize that it would be folly to  
8 ascribe any particular significance to the number and  
9 types of questions the board directs to a particular  
10 witness as compared to any other witness.

11 Trying to draw any conclusions about how  
12 the board perceives the testimony of a witness or  
13 witnesses on a particular matter, based on the number  
14 and types of questions the board asks, is not fair to  
15 the witness, not fair to the party that sponsored the  
16 witness, and not fair to the board.

17 In questioning any particular witness or  
18 group of witnesses, the board is attempting to create  
19 a record to support a fair and reasonable  
20 determination of the issues that are before us for  
21 decision.

22 Unless the board members have anything  
23 further or unless the participants have something else  
24 they need to bring to the Court's attention, I think  
25 we will proceed with admitting evidence.

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1           Let me say that as we proceed, NINA will  
2 go first with this, because under 10 CFR 2.325, NINA,  
3 the Applicant, has the burden of proof in this  
4 proceeding, and under 10 CFR 2.324, it will open and  
5 close our hearing.

6           Accordingly, we will begin with the  
7 Applicant, NINA.

8           MR. EYE: Your Honor, I do have a matter  
9 to bring before the panel.

10          JUDGE GIBSON: Oh, I'm sorry, Mr. Eye.  
11 Yes.

12          MR. EYE: Your Honor, yesterday evening I  
13 received a call from Mr. Mosenthal, and he has  
14 developed a medical issue that will, according to his  
15 physician's orders, preclude him from traveling. He  
16 has developed a systemic infection and has requested  
17 the possibility of testifying by telephone, or  
18 providing his cross-examination testimony by  
19 telephone.

20          I have inquired of Mr. Frantz, Mr.  
21 Spencer, and they do not object to that arrangements.  
22 If there is an alternative to that that we can come up  
23 with -- that is, to the telephone -- we would  
24 certainly explore that, but I would seek leave to do  
25 that tomorrow when he is set to sit for cross-

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1 examination.

2 JUDGE GIBSON: Let me first see if it's  
3 possible to do that.

4 Mr. Welkie?

5 (Pause.)

6 JUDGE GIBSON: Mr. Welkie indicates that  
7 it is possible to do that tomorrow, and there is no  
8 objection from either party?

9 MR. SPENCER: No objection.

10 MR. FRANTZ: No objection, and we would  
11 urge the board to do that.

12 JUDGE GIBSON: Okay. I mean, the only  
13 alternative I think we have is to submit written  
14 questions to the witness and have them submit them  
15 back to us, and the record would remain open quite a  
16 while. And frankly, we can actually carry on a  
17 dialog, but let me see if Judge Charbeneau or Judge  
18 Arnold has any questions.

19 MR. EYE: Thank Your Honor.

20 JUDGE CHARBENEAU: I have a question.  
21 Will he have any ability to see exhibits that we're  
22 displaying here?

23 MR. EYE: Other than his reference to the  
24 exhibits that he would have in front of him, I don't  
25 think that there's a way to transmit the video image

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1 of those exhibits, at least as far as I'm aware.

2 JUDGE CHARBENEAU: Would we be able to  
3 send, possibly by fax, copies of pages of exhibits  
4 with highlighted sections that we could talk from?

5 MR. EYE: I don't see why not.

6 JUDGE CHARBENEAU: Does he have access to  
7 a fax machine?

8 MR. EYE: Yes. And I was going to say  
9 either that or perhaps even email those to him, and  
10 presumably he would have the similar sort of access  
11 that might even be quicker, but whichever way would  
12 accommodate the proceedings and the panel, we would  
13 certainly endeavor to meet those.

14 JUDGE CHARBENEAU: And he has copies of  
15 all of the exhibits that have been filed?

16 MR. EYE: I believe he does.

17 JUDGE CHARBENEAU: I have no objections to  
18 it.

19 JUDGE GIBSON: Mr. Eye, I would encourage  
20 you to confirm that with him --

21 MR. EYE: I will.

22 JUDGE GIBSON: -- before we proceed. I  
23 think the important thing is at least we have until  
24 tomorrow, so if we have to FedEx something or we have  
25 to PDF it or we have to fax it, we can do this in

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1 advance of his testimony.

2 The other thing that we will need to be  
3 doing, I supposed, is -- I guess that will be fine,  
4 because these will just -- if they're not going to be  
5 highlighted copies of an exhibit but some  
6 demonstrative that either Judge Charbeneau or Judge  
7 Arnold creates, we'll just have to figure out a way to  
8 get that to him and to the parties as well, I suppose.

9 But we'll -- I'm sure where there's a will  
10 there's a way. It's important that we accommodate  
11 everyone here. And since neither the Applicant nor  
12 the staff's opposed it, Judge Charbeneau, Judge Arnold  
13 are okay with this, then I guess we'll proceed.

14 MR. EYE: Thank you very much. We  
15 appreciate that.

16 JUDGE GIBSON: But like I said, at the  
17 next break if you could just confirm that and let us  
18 know when we come back on the record.

19 MR. EYE: I should have a call to him  
20 right now, so I'm expecting to hear from him directly.  
21 Thank you.

22 JUDGE GIBSON: Okay. I need to bring  
23 something else to y'all's attention before Mr. Frantz  
24 proceeds.

25 Mr. Welkie reminded me that microphone --

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1 when you use the microphone, you need to push the  
2 button on the microphone where it says "push." And  
3 that will ensure that your microphone is on.

4 If you don't want to broadcast some  
5 conversation you're having with somebody next to you,  
6 it might be a good idea to push that button again so  
7 that everyone else doesn't hear it. Fair enough?

8 Okay. I understand that we will be -- for  
9 those of you that do need wireless connection in here,  
10 it is possible to have a wireless connection. The  
11 user name, I believe, is Agenda, but I do not know  
12 what the password is. Does anybody know what the  
13 password is?

14 VOICE: Google.

15 JUDGE GIBSON: Google. The password is  
16 Google. So we'll have -- the user name is Agenda, and  
17 the password is Google. Are they all small or caps,  
18 or does it matter? It's not case sensitive? Okay.

19 Okay. I believe Judge Charbeneau's got  
20 something else.

21 JUDGE CHARBENEAU: Just another follow-up  
22 question with regard to Mosenthal. Will he be  
23 listening in to the examination of the other experts?

24 MR. EYE: Actually I was going to inquire  
25 to determine whether that was allowable or if that

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1 would be possible to do. I mean, I -- he would like  
2 to. I know I spoke with him about that very point,  
3 and he actually inquired if that would be possible,  
4 for him to be able to be in by phone.

5 JUDGE GIBSON: Hold on just one second.

6 (Pause.)

7 JUDGE GIBSON: Mr. Welkie believes that  
8 it's going to be possible to do all these things, but  
9 while you're trying to get ahold of your witness, Mr.  
10 Welkie is trying to get ahold of the IT coordinator  
11 here to find out how we can do that, but he's pretty  
12 confident that -- this is a very sophisticated system  
13 here -- IT system, and so it appears likely we should  
14 be able to do all that by telephone.

15 MR. EYE: Very well. Thank you, Judge.

16 MR. SPENCER: Your Honor?

17 JUDGE GIBSON: Yes, Mr. Spencer?

18 MR. SPENCER: Yes. The board has stated  
19 that the Applicant would go first and present evidence  
20 on contention CL-2 and tomorrow DEIS-1. However, I  
21 just want to remind the board that we presented  
22 testimony from our project manager for the sole  
23 purpose of sponsoring the EIS into the record, so --

24 JUDGE GIBSON: Right.

25 MR. SPENCER: I doubt that there's really

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1 a need to question our project manager, because the  
2 testimony is for the sole purpose of sponsoring the  
3 exhibits into the record, but we would like the  
4 exhibits to be entered and admitted, including the  
5 entire EIS.

6 JUDGE GIBSON: Before NINA makes its  
7 offer?

8 MR. SPENCER: The timing is fine.

9 JUDGE GIBSON: Okay.

10 MR. SPENCER: Whichever timing the board  
11 wants to use, that's fine by us.

12 JUDGE GIBSON: Okay. Fair enough. I  
13 think that we'll -- my suspicion is that everyone's  
14 going to want to use it, so everybody's probably going  
15 to be willing to stipulate that it's a true and  
16 correct copy of your EIS, but we'll -- if it's okay  
17 with you, we'll let you address that as soon as we  
18 have an offer of evidence from the Applicant.

19 Is there a reason for you to do this  
20 first?

21 MR. SPENCER: Well, I mean --

22 JUDGE GIBSON: Maybe there is.

23 Mr. Frantz?

24 MR. FRANTZ: It does not matter to us  
25 either way.

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1 JUDGE GIBSON: Well, why don't we just go  
2 ahead and let you take care of this, Mr. Spencer.

3 MR. SPENCER: Okay. That's fine. Do you  
4 want the witness to be sworn in?

5 JUDGE GIBSON: Oh, yeah. If you want to  
6 go ahead and present your witness over there, we can  
7 do that.

8 (Pause.)

9 JUDGE GIBSON: Would you please state your  
10 name.

11 MS. MUIR: I'm Jessie Muir with the  
12 Nuclear Regulatory Commission.  
13 Whereupon,

14 JESSIE MUIR  
15 having been first duly sworn, was called as a witness  
16 herein and was examined and testified as follows:

17 JUDGE GIBSON: Thank you.

18 MR. SPENCER: Ms. Muir, on the screen is  
19 Exhibit NRC000001, prefiled direct testimony of Jessie  
20 M. Muir, sponsoring NUREG 1937 into the hearing  
21 record. Do you recognize this exhibit?

22 MS. MUIR: Yes, I do.

23 MR. SPENCER: Is that your testimony?

24 MS. MUIR: Yes, it is.

25 MR. SPENCER: Is that testimony true and

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1 correct, to the best of your knowledge and belief?

2 MS. MUIR: Yes, it is.

3 MR. SPENCER: I would like this exhibit to  
4 be marked and admitted into the record.

5 JUDGE GIBSON: Okay. It's already been  
6 marked, I assume. Is there --

7 MR. SPENCER: Well, I thought the DDMS  
8 system had a separate marking.

9 JUDGE GIBSON: All you need to do is  
10 identify it; it's already been marked.

11 MR. SPENCER: Okay.

12 JUDGE GIBSON: Identify it and then offer  
13 it.

14 MR. SPENCER: Okay. Can you bring up --  
15 well, I'll offer it into --

16 JUDGE GIBSON: There you go.

17 MR. SPENCER: Okay.

18 JUDGE GIBSON: Any objection?

19 MR. EYE: None from the Intervenors, Your  
20 Honor.

21 MR. FRANTZ: No objection.

22 MR. SPENCER: Can you bring up NRC000002?

23 (Pause.)

24 MR. SPENCER: The title of this document  
25 is Resume of Jessie M. Muir. Do you recognize this

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1 document?

2 MS. MUIR: Yes, I do.

3 MR. SPENCER: Is the contents of this  
4 document true and correct to the best of your  
5 knowledge and belief?

6 MS. MUIR: Yes, it is.

7 MR. SPENCER: The exhibit having been  
8 identified, we offer it into evidence.

9 JUDGE GIBSON: Okay. Any objection?

10 MR. EYE: None.

11 MR. FRANTZ: No objection.

12 JUDGE GIBSON: Both documents will be  
13 admitted as evidence.

14 (The documents referred to,  
15 having been previously marked  
16 for identification as NRC000001  
17 and NRC000002, were received in  
18 evidence.)

19 MR. SPENCER: Ms. Muir offered into  
20 evidence the FEIS -- that's Exhibit NRC000003A through  
21 D, because it's a large document.

22 JUDGE GIBSON: Okay.

23 MR. SPENCER: Before -- on the screen is  
24 a document titled Environmental Impact Statement for  
25 Combined Licenses for South Texas Project Electric

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1 Generating Station Units 3 and 4.

2 Do you recognize this document?

3 MS. MUIR: Yes, I do.

4 MR. SPENCER: The document having been  
5 identified, we offer it into evidence.

6 MR. EYE: No objection.

7 MR. FRANTZ: No objection.

8 JUDGE GIBSON: It will be admitted.

9 (The document referred to,  
10 having been previously marked  
11 for identification as  
12 NRC000003A, was received in  
13 evidence.)

14 MR. SPENCER: 3B, this is a portion of the  
15 FEIS, starting with Section 2.4, Ecology. Do you  
16 recognize this document?

17 MS. MUIR: Yes.

18 MR. SPENCER: The document having been  
19 admitted, we would like to enter into evidence --  
20 offer into evidence NRC000003B.

21 JUDGE GIBSON: Any objection?

22 MR. EYE: No, Your Honor.

23 MR. FRANTZ: No objection.

24 JUDGE GIBSON: It will be admitted.

25 (The document referred to,

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1                   having been previously marked  
2                   for     identification     as  
3                   NRC000003B, was received in  
4                   evidence.)

5                   MR. SPENCER: 3C, please. This is Exhibit  
6                   NRC000003C. The title is Section 3.0, Site Layout and  
7                   Plant Description. It is a portion of the EIS --  
8                   Final EIS. Do you recognize this document?

9                   MS. MUIR: Yes, I do.

10                  MR. SPENCER: Having been identified, we  
11                  would like to offer this exhibit into evidence?

12                  JUDGE GIBSON: Any objection?

13                  MR. EYE:     No objection from the  
14                  Intervenors.

15                  MR. FRANTZ: No objection.

16                  JUDGE GIBSON: Okay. It is admitted.

17                               (The document referred to,  
18                               having been previously marked  
19                               for     identification     as  
20                               NRC000003C, was received in  
21                               evidence.)

22                  MR. SPENCER: 3D. This is volume 2 of the  
23                  Final Environmental Impact Statement for STP. It is  
24                  labeled Exhibit NRC000003D.

25                  Do you recognize this document?

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1 MS. MUIR: Yes, I do.

2 MR. SPENCER: The document having been  
3 identified, we would like to offer it into evidence.

4 JUDGE GIBSON: Any objection?

5 MR. EYE: No objection.

6 MR. FRANTZ: No objection.

7 JUDGE GIBSON: Does that conclude your  
8 examination of this witness?

9 MR. SPENCER: Yes, Your Honor.

10 JUDGE GIBSON: Just one question. Do you  
11 have any corrections to any of these exhibits --

12 MS. MUIR: No, sir.

13 JUDGE GIBSON: -- from what they have --  
14 as they've been offered?

15 MS. MUIR: No.

16 JUDGE GIBSON: Okay. Can the witness be  
17 excused?

18 MR. SPENCER: Yes, Your Honor.

19 JUDGE GIBSON: Any objection to the  
20 witness being excused?

21 MR. EYE: None for the Intervenor, Your  
22 Honor.

23 (The document referred to,  
24 having been previously marked  
25 for identification as

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1 NRC000003D, was received in  
2 evidence.)

3 JUDGE GIBSON: I don't know why you'd need  
4 to stick around, but, you know, this is pretty  
5 exciting stuff, so you may want to stick around the  
6 next two days. Thank you.

7 (Whereupon, the witness was excused.)

8 JUDGE GIBSON: Okay. Now that we've  
9 gotten the Environmental Impact Statement in the  
10 record, I think that you can proceed, Mr. Frantz.

11 What I had envisioned was that we would go  
12 through the documents, have an offer of them, have any  
13 objections, and then we would proceed to testimony,  
14 but perhaps we needed to do that that way, so that's  
15 fine. We did.

16 MR. FRANTZ: And that was my vision also,  
17 based on our discussion yesterday at the pretrial  
18 conference, that we would introduce exhibits as a  
19 group, and with the board's leave, I propose to do  
20 that now with respect to our exhibits.

21 JUDGE GIBSON: Yes.

22 MR. FRANTZ: In referring to the exhibit  
23 numbers, I will skip the numerous zeros in the  
24 exhibits and just reference the final digits.

25 I'd like to refer the board to the

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1 following exhibits: STP1 through 3, STP5 through 8,  
2 STP10 through 13, STP16 and STP18 through 35.

3 JUDGE GIBSON: Can you go over those one  
4 more time? I got to 8, and then I didn't hear you  
5 after that.

6 MR. FRANTZ: 10 through 13, 16, and 18  
7 through 35.

8 JUDGE GIBSON: And these are as noted on  
9 your May 31, 2011, exhibit list?

10 MR. FRANTZ: And also the exhibit list we  
11 filed yesterday, so that exhibit list is marked as  
12 August 17, 2011.

13 JUDGE GIBSON: Okay. And that would  
14 include the ones of 32 to 35?

15 MR. FRANTZ: That's correct. And each of  
16 these documents has been marked already. Each of  
17 those documents, as you indicate, has been identified  
18 in our exhibit list.

19 Additionally, with respect to those  
20 exhibits which are prefiled testimony, the prefiled  
21 testimony itself swears to the truthfulness and  
22 accuracy of those exhibits and that testimony.

23 JUDGE GIBSON: Okay.

24 MR. FRANTZ: And so at this time we would  
25 offer up these exhibits for admission into evidence.

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1 JUDGE GIBSON: Objections, Mr. Eye?

2 MR. EYE: No objection, Your Honor.

3 JUDGE GIBSON: Mr. Spencer, any  
4 objections?

5 MR. SPENCER: No objections.

6 JUDGE GIBSON: Okay. As offered, the  
7 following exhibits will be admitted: STP1, 2, 3, 5,  
8 6, 7, 8, 10, 11, 12, 13, 16, 18, 19, 20, 21, 22, 23,  
9 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35.

10 (The documents referred to,  
11 having been previously marked  
12 for identification as STP1  
13 through 3, 5 through 8, 10  
14 through 13, 16, and 18 through  
15 35, were received in evidence.)

16 MR. FRANTZ: Thank you, Your Honor.

17 JUDGE GIBSON: Let me ask a question, just  
18 for clarification's sake. Exhibits that have been  
19 previously been marked 4, 9, 14, 15, 17, are you  
20 effectively withdrawing those exhibits?

21 MR. FRANTZ: No. What happened, those  
22 were part of our draft exhibit list. We distributed  
23 that list shortly before we initially filed it. As it  
24 turns out, those numbers that we had initially had on  
25 our list were duplicates of documents the staff also

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1 had on its list.

2 JUDGE GIBSON: Okay.

3 MR. FRANTZ: And so they are not actually  
4 different from what the staff has, and we don't have  
5 any separate documents corresponding to those numbers.

6 JUDGE GIBSON: Okay. Bear with me just  
7 one second.

8 Mr. Welkie?

9 (Pause.)

10 JUDGE GIBSON: Mr. Spencer?

11 MR. SPENCER: Yes, Your Honor.

12 JUDGE GIBSON: With respect to the staff  
13 exhibit list, would you like to make an offer?

14 MR. SPENCER: Yes. We can do this en  
15 masse, too. We would like to offer into evidence  
16 Exhibits NRC -- and I'll leave out the zeros, too --  
17 NRC4 to NRC72.

18 Now, NRC4, is a revised exhibit. The  
19 exhibit number for that is NRCR000004. We offered  
20 that into evidence yesterday.

21 JUDGE GIBSON: Actually, you provided it  
22 to Mr. Welkie yesterday. Right?

23 MR. SPENCER: Okay. We -- Exhibits 61  
24 through -- 66 through 71 were also provided yesterday.  
25 There's also an Exhibit 72, which is an affidavit of

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1 Dan Mussatti and Michael Scott, two of our witnesses,  
2 with respect to the additional exhibits.

3 JUDGE GIBSON: And you say the additional  
4 exhibits -- you're referring to NRC66 to 71. Is that  
5 correct?

6 MR. SPENCER: Yes, Your Honor. And the --  
7 Exhibit 72 was provided yesterday to Mr. Welkie and  
8 the Intervenors and the Applicant. We have not  
9 provided it to the board; we have extra hard copies if  
10 you wish to see the affidavit.

11 JUDGE GIBSON: Okay. It might be good to  
12 have one copy, anyway, up here, if you don't mind.  
13 Mr. Esser can keep it.

14 Now, does that conclude your offer?

15 MR. SPENCER: Yes, Your Honor.

16 JUDGE GIBSON: Okay.

17 (Pause.)

18 MR. SPENCER: Yes, all subparts. So when  
19 I said NRC4 to 72, that would include the exhibits  
20 with multiple subparts: 8A, 8B, I think 9A and 9B;  
21 there may be a few others that have subparts, but  
22 every exhibit within that range.

23 JUDGE GIBSON: Okay. So your offer  
24 includes all exhibit numbers and all subparts of those  
25 numbers.

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1 MR. SPENCER: Yes, Your Honor.

2 JUDGE GIBSON: Okay. Now -- and then  
3 previously we've had -- 1, 2, and 3 have already been  
4 offered and admitted as a result of the testimony we  
5 just had from your witness with respect to the EIS.  
6 Is that right?

7 MR. SPENCER: Yes, Your Honor.

8 JUDGE GIBSON: Okay. And the only revised  
9 exhibit you have is 4; all the rest of them are clean.

10 MR. SPENCER: Yes, Your Honor.

11 JUDGE GIBSON: Okay. Fair enough.

12 Okay. Mr. Eye, any objections?

13 MR. EYE: No, Your Honor.

14 JUDGE GIBSON: Mr. Frantz?

15 MR. FRANTZ: We have no objection.

16 JUDGE GIBSON: Okay.

17 Mr. Welkie, just a second.

18 (Pause.)

19 JUDGE GIBSON: So you have no gaps at all  
20 like the Applicant did.

21 MR. SPENCER: No, Your Honor.

22 JUDGE GIBSON: Okay. NRC staff Exhibits  
23 4 through 72 are admitted in evidence.

24 (The documents referred to,  
25 having been previously marked

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1 for identification as NRC4  
2 through NRC72, were received in  
3 evidence.)

4 JUDGE GIBSON: Mr. Eye?

5 MR. EYE: Yes, Your Honor.

6 JUDGE GIBSON: Let me ask you, first of  
7 all, are we operating off the July 14 -- are we  
8 operating off the August 11, 2011, exhibit list?

9 MR. EYE: Yes, sir.

10 JUDGE GIBSON: Okay. Thank you.

11 MR. EYE: We would offer into evidence --  
12 and I will also dispense with the numerous zeros and  
13 just go with the final number designations.

14 JUDGE GIBSON: Good call.

15 MR. EYE: We would offer Intervenors'  
16 Exhibits 1 through 4, 7, 9, 11 through 17, 19 through  
17 40 -- excuse me; it should be 19 through 41; excuse  
18 me -- 45 to 49. Exhibit Number 50 should be a revised  
19 50; INTR50, and then 51 through 54, and 55 would be  
20 INTR55.

21 JUDGE GIBSON: Okay. Let me make sure  
22 I've got this right now. You're offering essentially  
23 all the exhibits on your July 14 list -- I'm sorry --  
24 your August 11 list, except for the ones that are  
25 obviously marked through.

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1 MR. EYE: That's correct, Your Honor.

2 JUDGE GIBSON: And the only exhibits that  
3 have a different number than are on this August 11  
4 exhibit list are INT50 is now INTR50, and Exhibit  
5 INT55 is now INTR55. Is that correct?

6 MR. EYE: I believe that's correct.

7 Mr. Welkie, did you have --

8 (Pause.)

9 MR. EYE: I beg your pardon; it should  
10 be -- yes.

11 JUDGE GIBSON: And INTR1.

12 MR. EYE: I beg your pardon; that's  
13 correct.

14 MR. FRANTZ: And I believe some of the  
15 prefiled testimony also had an R designation, if I  
16 recall correctly, because we went through multiple  
17 revisions of it.

18 MR. EYE: INTR did, and I think his direct  
19 is 1, and his rebuttal is -- I beg your pardon; 41  
20 should also be INTR, Your Honor.

21 JUDGE GIBSON: Yes.

22 MR. EYE: Is that what you have as well?  
23 Okay.

24 MR. SPENCER: Your Honor?

25 JUDGE GIBSON: Hold on just one second.

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1 Let me just finish with Mr. Eye -- clarifying what Mr.  
2 Eye's offering first, and then we'll address it.

3 INT45, however, is not a revision. Is  
4 that right?

5 MR. EYE: It is not. I don't believe  
6 there was anything changed from its original version.

7 JUDGE GIBSON: Okay. Let me go back  
8 through this one more time, just to be sure that we're  
9 all on the same page of the same hymnal about what Mr.  
10 Eye is making an offer about, and then we'll let you  
11 talk, Mr. Spencer.

12 MR. SPENCER: Okay.

13 JUDGE GIBSON: INTR1, INT2 to 4, INT7,  
14 INT9, INT11 to 17, INT19 to 40, INTR41, INT45 to 49,  
15 INTR50, and INTR55.

16 MR. EYE: That's correct.

17 JUDGE GIBSON: And that's what you're  
18 offering.

19 MR. EYE: Yes, it is, Your Honor.

20 JUDGE GIBSON: Okay. Now, let me just ask  
21 Mr. Welkie -- does that comport with what you've  
22 received?

23 MR. WELKIE: Okay.

24 JUDGE GIBSON: Now, Mr. Spencer, you had  
25 a question?

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1 MR. SPENCER: Yes. In terms of Mr.  
2 Johnson's rebuttal testimony, INT45, I believe the  
3 latest version that was submitted was labeled INTR.  
4 00045, and there was an earlier version that was just  
5 INT, a series of zeros, and 45.

6 Now, I'm not clear on which version is  
7 being offered into evidence.

8 JUDGE GIBSON: Fair enough. so you're  
9 saying that there's two 45s; there's an INT45 and an  
10 INTR45.

11 MR. SPENCER: Yes, Your Honor.

12 JUDGE GIBSON: Okay. Mr. Eye, which one  
13 is it you're offering?

14 MR. EYE: Well, they're the same, so we  
15 would withdraw the -- we'll just withdraw the R, and  
16 that was -- there were no changes in the rebuttal  
17 testimony subsequent to the motion to strike.

18 MR. SPENCER: I just want to bring to the  
19 Court's attention that the -- I think the R version of  
20 the testimony was missing page 18.

21 MR. EYE: Well, that's why we're  
22 withdrawing it.

23 JUDGE GIBSON: That's all the more reason  
24 to withdraw INTR45. So thank you for bringing that to  
25 our attention, Mr. Spencer.

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1 MR. SPENCER: Yes.

2 JUDGE GIBSON: And again, Mr. Welkie, that  
3 comports with what you're received?

4 MR. WELKIE: Yes.

5 JUDGE GIBSON: Okay. Now, Mr. Eye has  
6 made an offer. Do we have any objections to his  
7 offer?

8 MR. FRANTZ: Your Honor, in our motion in  
9 limine, we objected to certain portions of the  
10 prefiled testimony and certain of the exhibits. The  
11 board denied that motion in part, purely to preserve  
12 our position, and we like to just renew our objection  
13 to those same portions; otherwise we have no  
14 objections to the exhibits.

15 JUDGE GIBSON: Thank you. Your objections  
16 are duly noted, and a record has been made. Thank  
17 you.

18 Mr. Spencer?

19 MR. SPENCER: Your Honor, we also filed a  
20 motion in limine, and the board also denied that  
21 motion in part. We renew the objections we made that  
22 the board denied to preserve our objections for the  
23 record.

24 One other issue: On INTR1, there was --  
25 I believe the revision was made yesterday, and I

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1 haven't seen -- I think it was to page 13, and I just  
2 wanted to -- if I could see page 13 of that exhibit,  
3 that would -- on the screen would be fine. I could --

4 JUDGE GIBSON: Mr. Welkie, could you put  
5 up INTR-1 on page 13, just so Mr. Spencer can see it?

6 (Pause.)

7 MR. SPENCER: Your Honor, the -- when  
8 we -- Your Honor, in the board's order on the motion  
9 in limine -- I refer the board to page 2 and item  
10 1(a), and excluding from Mosenthal's direct testimony  
11 stated, The two sets of lines that deal with federal  
12 equipment standards and the resulting impacts on net  
13 need after federal equipment standards, and two lines  
14 have been blacked out on this table, but the lines  
15 that the board said should be blacked out haven't been  
16 blacked out.

17 And that's important to us because we  
18 believe that these are outside the scope of the  
19 contention, and the Intervenor's agree that the  
20 surrounding testimony could be excluded.

21 JUDGE GIBSON: So what you're suggesting,  
22 if I may put it in my own words, is Mr. Eye has failed  
23 to strike out the appropriate lines. Has he --

24 Mr. Eye, have you stricken the wrong lines  
25 and not stricken the right lines?

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1 MR. EYE: Well, the lines that were to be  
2 stricken would have been lines 8 and 9, and it looks  
3 like it was -- what got stricken were the two just  
4 above it.

5 JUDGE GIBSON: Which probably shouldn't  
6 have been stricken.

7 MR. EYE: That would be correct, Your  
8 Honor.

9 JUDGE GIBSON: This is what I would like  
10 to do. When -- this is going to be coming up on  
11 Friday. Right?

12 MR. EYE: Correct.

13 JUDGE GIBSON: Okay. What I would like to  
14 do is, if we can get an agreement from all parties,  
15 Mr. Eye will agree to strike the lines regarding  
16 equipment standards and unstrike the lines that he  
17 didn't intend to strike, which I think we're all in  
18 agreement are okay, other than perhaps with your  
19 motion in limine they're okay. And we'll go ahead and  
20 admit this exhibit but allow Mr. Eye to provide us all  
21 with a corrected page 13 of this Exhibit INTR1.

22 Is that right?

23 MR. EYE: Absolutely, Your Honor. Thank  
24 you very much.

25 JUDGE GIBSON: Does that work, Mr. Frantz?

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1 MR. FRANTZ: Yes, it does, and just to  
2 clarify, Mr. Eye, I think it's not only lines 8 and 9,  
3 but it's also at the bottom, so it's two sets.

4 MR. EYE: That's correct. It would be the  
5 federal equipment appliance standard savings net need  
6 after federal equipment appliance standards, and then  
7 the last two substantive lines of that that deal with  
8 the comparable data.

9 MR. FRANTZ: Yes. Thank you.

10 MR. EYE: Thank you.

11 JUDGE GIBSON: I don't want to overburden  
12 Mr. Welkie, but, frankly, if this is not done right,  
13 it will overburden him. So I'm going to offer his  
14 services to you, Mr. Eye. Try to make sure that this  
15 page is done properly so that we can all live happily  
16 ever after. Okay?

17 MR. EYE: I appreciate the accommodation.  
18 Thank you very much.

19 JUDGE GIBSON: Okay. All right. With  
20 that offer and the objections duly noted, all of the  
21 exhibits will be offered as offered, subject to one  
22 thing -- hold on a second, please.

23 (Pause.)

24 JUDGE GIBSON: One other thing I'd like  
25 for you to do. Mr. Welkie got this, but I guess no

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1 one else did. Exhibit R45 is missing page 18, but it  
2 does have an affidavit. The original 45 you submitted  
3 does have page 18, but it does not have an affidavit.

4 Now, what I would like you do is also  
5 clean up Exhibit 45 to Mr. Welkie's satisfaction.  
6 And, again, I'm assuming that you all have no  
7 objection to having a proper affidavit and page 18 for  
8 Exhibit 45?

9 MR. EYE: That's correct.

10 JUDGE GIBSON: You all okay with that? I  
11 think it was just an oversight and nothing nefarious  
12 here in that not being done properly.

13 Mr. Welkie, thank you.

14 Okay. Subject to correcting -- providing  
15 corrected copies of Exhibits 1 and 45 or R1 and R45,  
16 those exhibits will be admitted.

17 (The documents referred to,  
18 having been previously marked  
19 for identification as INTR1,  
20 INT2 to 4, INT7, INT9, INT11 to  
21 17, INT19 to 40, INTR41, INT45  
22 to 49, INTR50, and INTR55, were  
23 received in evidence.)

24 JUDGE GIBSON: And I think what we will do  
25 now is to take a break for ten minutes, and then we

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1 will -- let's make it 15, and then we will come back  
2 on and begin examination of witnesses?

3 Is there anything further before we take  
4 a break?

5 (Whereupon, a brief recess was taken.)

6 JUDGE GIBSON: Before we call our  
7 witnesses, I was just apprised during our break that  
8 there has been some discussion about the possibility  
9 of using Skype as a way to hook Mr. Eye's witness up  
10 for tomorrow.

11 I have no idea if that is going to be  
12 technically feasible. If it is, however, I would like  
13 you all to give some thought to whether there's any --  
14 you see any problems with that. And if not, then that  
15 may be an even better solution than doing it by  
16 telephone, because we'll at least have a visual image  
17 of the witness.

18 MR. FRANTZ: Your Honor, we fully agree  
19 with that. That's a marvelous idea.

20 MR. SPENCER: No objections.

21 JUDGE GIBSON: Okay. Great.

22 If there's nothing further with regard to  
23 offers of evidence, I believe the next order of  
24 business will be for the Applicant's witnesses with  
25 respect to contention CL-2.

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1 MR. FRANTZ: Yes. I'd like to call Mr.  
2 Jeffrey Zimmerly and Adrian Pieniazek to the witness  
3 stand, please.

4 Whereupon,

5 JEFFREY ZIMMERLY

6 and

7 ADRIAN PIENIAZEK

8 having been first duly sworn, were called as  
9 witnesses herein and were examined and testified as  
10 follows:

11 JUDGE GIBSON: Thank you.

12 MR. FRANTZ: Would each of you identify  
13 yourself for the board, please.

14 MR. ZIMMERLY: My name is Jeffrey  
15 Zimmerly. I work for Tetra Tech.

16 MR. PIENIAZEK: My name is Adrian  
17 Pieniazek, with NRG Energy.

18 MR. FRANTZ: Your Honor, their testimony  
19 has already been admitted into evidence and sworn to,  
20 and so we would turn the witnesses over to the board  
21 for questioning.

22 JUDGE GIBSON: Let me just ask first, do  
23 either of you have any corrections to your testimony  
24 as it's been admitted?

25 MR. ZIMMERLY: No.

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1 MR. PIENIAZEK: No.

2 JUDGE GIBSON: Okay. I believe that Judge  
3 Arnold has some questions.

4 JUDGE ARNOLD: A few. I'm going to start  
5 out with need for power.

6 Mr. Welkie, I had a figure.

7 (Pause.)

8 JUDGE ARNOLD: Question for Mr. Pieniazek.

9 Have you -- you have prior experience in  
10 purchasing or forecasting large amounts of electrical  
11 power, do you?

12 MR. PIENIAZEK: Yes, I do.

13 JUDGE GIBSON: Okay. Have you ever been  
14 able to compare a forecast made before a purchase to  
15 the actual price after it's been purchased?

16 MR. PIENIAZEK: With the actual price?

17 JUDGE ARNOLD: Yes.

18 MR. PIENIAZEK: I do recall being involved  
19 in some backcast analyses, but I, you know, don't  
20 recall details at this time in what those were.

21 JUDGE ARNOLD: So it would be difficult to  
22 really say how accurate a forecast of the cost of  
23 power is?

24 MR. PIENIAZEK: You could certainly  
25 backcast it to determine how accurate your forecast

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1 was, by looking at the actual price after you tried to  
2 forecast. Sure.

3 JUDGE ARNOLD: I'm just trying to  
4 understand -- and I've got some simple cartoons --  
5 where the need for power comes from. And from  
6 descriptions given in testimony, I made this simple  
7 cartoon up, where the red line would be the baseload  
8 power, and there's some daily variation on top of  
9 that, and my understanding is you try to predict what  
10 the highest demand is going to be over some period,  
11 and that's your maximum peak demand, and on this  
12 figure I said that's your 100-percent demand.

13 And then you try to have your system  
14 capacity 13.75 percent above that. So is this  
15 essentially a reasonable cartoon of demand and supply?

16 MR. PIENIAZEK: Yes, it is. That's --  
17 this is very similar to the method that ERCOT uses.

18 JUDGE GIBSON: Judge Arnold, I'm sorry;  
19 excuse me. Is this going to be marked in some way for  
20 the record so that we can go back and refer to it in  
21 the transcript or some other way?

22 Hold on just a second, Mr. Welkie.

23 (Pause.)

24 JUDGE GIBSON: Sorry about that. I forgot  
25 to push the green button. What we'll do is we'll just

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1 make this Board Demonstrative 1, for simplicity  
2 purposes, so that to the extent that either -- any of  
3 us may use a demonstrative that's not part of an  
4 exhibit, it will be -- that way y'all can follow it  
5 when y'all do your -- review the transcript.

6 So we can call it BD1, Board Demonstrative  
7 1. Is everyone okay with that?

8 Mr. Eye?

9 MR. EYE: That's fine, Your Honor.

10 JUDGE GIBSON: Mr. Spencer?

11 MR. SPENCER: Yes, Your Honor.

12 JUDGE GIBSON: Okay. And Mr. Frantz?

13 MR. FRANTZ: Yes, thank you very much.

14 JUDGE GIBSON: Okay. Mr. Welkie's okay  
15 with it, too, so I think we're all right. Thank you.

16 (The document referred to was  
17 marked for identification as  
18 Board Demonstrative 1.)

19 JUDGE GIBSON: I'm sorry, Judge Arnold.

20 Thank you.

21 Just one more thing before you get  
22 started.

23 Mr. Welkie?

24 (Pause.)

25 JUDGE ARNOLD: From Mr. Johnson's direct

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1 testimony, he says that the -- all four STP plants  
2 together would represent about 6 percent of all  
3 generation in ERCOT. Is that approximately correct?

4 MR. PIENIAZEK: The sum of all four? That  
5 sounds about right, in ballpark, sure.

6 JUDGE ARNOLD: Mr. Welkie, could we go to  
7 the next figure.

8 JUDGE GIBSON: And this will be BD2.

9 (The document referred to was  
10 marked for identification as  
11 Board Demonstrative 2.)

12 JUDGE ARNOLD: So a loss of all four STP  
13 units essentially drops your capacity around that 6  
14 percent, and from what I understand, this shows that  
15 there's still adequate capacity within ERCOT to meet  
16 the demand; it's just a matter of getting those units  
17 that you need up and running?

18 MR. PIENIAZEK: Right. What that would  
19 indicate is that if you lost all four units, since you  
20 have a reserve planning margin of 13.75 percent,  
21 losing the 6 percent should give you still enough  
22 margin to meet load and still have a little bit of  
23 reserve.

24 JUDGE ARNOLD: It's not even a matter of  
25 restoring mothballed plants or trying to import power;

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1 it's just starting up some units that aren't currently  
2 operating?

3 MR. PIENIAZEK: That's correct.

4 JUDGE ARNOLD: Mr. Welkie, the third  
5 figure.

6 JUDGE GIBSON: This will be BD3.

7 (The document referred to was  
8 marked for identification as  
9 Board Demonstrative 3.)

10 JUDGE ARNOLD: What I did on this was I  
11 looked at the instantaneous demand, and I increased it  
12 by the 13.75 percent to see what happens now is at  
13 times at peak demand you may no longer have your  
14 required reserve margin.

15 What would you do about that? Are -- is  
16 that a serious concern or --

17 MR. PIENIAZEK: Well, I guess the first  
18 thing I would say is that ERCOT carries operating  
19 reserves around the clock, and so if you had an  
20 incident -- and that amount of reserve is typically  
21 2300 megawatts for responsive, approximately 11- or  
22 1200 megawatts for non-spin, and then there's some  
23 reg-up. Those reserves are always there.

24 If you had all four STP units trip, now,  
25 likely they wouldn't happen instantaneously; they

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1 would -- you know, you might have them over a little  
2 time, but regardless of that situation, you would have  
3 a little bit of an upset, but after things -- after  
4 the other units started coming on, ERCOT is going to  
5 as quickly as possible put those operating reserves  
6 back on line with the other units that weren't on at  
7 the time of the unit trips.

8 So it's a concern immediately, but after  
9 a certain time frame, you have those same responsive  
10 reserves back on line later on.

11 JUDGE ARNOLD: Okay. I want to -- I'm  
12 done with the figures.

13 I want to move on to the discount rate.  
14 Now, if I wanted to know everything about discount  
15 rates, I'd probably want to talk to an economist or  
16 someone in that field. Is that correct?

17 MR. PIENIAZEK: Sure. I guess an  
18 economist would probably know more about a discount  
19 rate than an engineer like myself would.

20 JUDGE ARNOLD: So you're an engineer, not  
21 an economist.

22 MR. PIENIAZEK: That's correct.

23 JUDGE ARNOLD: But you consider yourself  
24 knowledgeable on use of discount rates in this. And  
25 how did you acquire that knowledge?

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1 MR. PIENIAZEK: On using --

2 JUDGE ARNOLD: On how to use a discount  
3 rate?

4 MR. PIENIAZEK: From a personal  
5 perspective, it was after I graduated from engineering  
6 school. Later on I went and got an MBA, business --  
7 master's in business. And of course we did a whole  
8 lot of that type of present-value calculations and the  
9 like in business school.

10 JUDGE ARNOLD: Sounds good, because I am  
11 not sure about what a discount rate is, so could you  
12 tell me what exactly the discount rate represents?

13 MR. PIENIAZEK: It represents -- it's  
14 basically -- since cash flows and expenses in the  
15 future have a different value than cash revenue and  
16 expenses do today, it's a way of discounting those  
17 future cash flows back to the present day.

18 And that's why it's called present value  
19 when you use a discount rate.

20 JUDGE ARNOLD: So if you discount it to  
21 present-day value and whatever that amount of money  
22 is, you had it today and you earmarked it for that  
23 future expense, you could be pretty much sure that at  
24 that time in the future you'd have the correct amount?

25 MR. PIENIAZEK: What I -- I guess if I

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1 understand your question, depending on the discount  
2 rate you use, high or low, it's like I can hold  
3 that -- hold those cash flows now, or I compare to  
4 what I would have in the future, but I'm discounting  
5 them back, to just -- to make sure that I -- or to try  
6 to determine what my -- what the value of those future  
7 flows -- cash flows would be.

8 I'm not sure I'm answering your question  
9 correctly, but it does give you a present value of  
10 future cash flows, and that's why you discount it  
11 back.

12 JUDGE ARNOLD: In the SAMDA analysis, how  
13 exactly is the discount rate applied? What is it  
14 you're discounting and --

15 MR. PIENIAZEK: You're discounting the  
16 future -- in this particular case you're discounting  
17 back the cost -- the maximum cost risk, including the  
18 replacement cost, because a core -- the -- a problem  
19 in a reactor could occur at any time in the life of  
20 that reactor, so it's a way to discount those back to  
21 a value that you can compare the SAMDA with.

22 JUDGE ARNOLD: Well, if you're discounting  
23 back from some -- the time of the accident, how do you  
24 do that without knowing what year the accident's going  
25 to occur in?

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1 MR. PIENIAZEK: That's why you do it back  
2 to the present value, because you don't know, so you  
3 can compare the SAMDA cost right then and there with  
4 the discounted flows in today.

5 MR. ZIMMERLY: NUREG/BR-0184 sets up a  
6 formula that accounts for any future year that it  
7 could occur in.

8 JUDGE ARNOLD: So is it essentially an  
9 average? You discount it from the first year of  
10 operation, and then you also discount it from the  
11 second year, third year, fourth year, and average them  
12 to get an expected discounted rate?

13 MR. ZIMMERLY: The calculation uses the  
14 start date of the plant and the end date of the plant,  
15 and each year it's discounted.

16 JUDGE ARNOLD: Okay.

17 MR. PIENIAZEK: And I would add, Your  
18 Honor, that in the calculations we perform, we  
19 basically just follow the guidance that was provided.  
20 Again, we're not -- or I'm not, anyway, an economist.  
21 We just follow the process as outlined by NUREG  
22 documents, and they suggested the discount rates to  
23 use and how to apply those.

24 JUDGE ARNOLD: Okay. There is some  
25 disagreement between the parties as to what index to

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1 use for adjusting the SAMDA costs from 1991 up to the  
2 present.

3 Now, if I wanted to know about price  
4 indexes, I'd probably, once again, want to go to an  
5 economist. Right? You're not an economist, but  
6 you're still knowledgeable in indexes, are you not?

7 MR. PIENIAZEK: Yes. I'm certainly  
8 familiar with them.

9 JUDGE ARNOLD: And, once again, this  
10 knowledge was initially acquired through your MBA  
11 program?

12 MR. PIENIAZEK: Initially, yes.

13 JUDGE ARNOLD: One difficulty I see in  
14 determining what index should be used for adjusting a  
15 SAMDA is the fact that the definition of SAMDA is  
16 somewhat nebulous.

17 So I want to look into what are the  
18 possible cost components of a SAMDA. I made up my own  
19 list, and I'd like you to just complete it, if you  
20 could, or say it's adequate.

21 Any SAMDA is going to require some  
22 engineering design and analysis. Most SAMDAs will  
23 involve some procurement --

24 JUDGE GIBSON: Hold on just a second.  
25 Could -- I'm sorry to interrupt you.

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1 If you could be sure to give a verbal  
2 response, a nod of the head does not help this court  
3 reporter. She's got enough on her plate right now, so  
4 please give a verbal response to questions that you're  
5 asked. Thank you.

6 JUDGE ARNOLD: There'll be some  
7 procurement, manufacturing, shipping, whatever -- you  
8 have to pay for that. Correct?

9 MR. PIENIAZEK: Yes.

10 MR. ZIMMERLY: That's correct.

11 JUDGE ARNOLD: Then if it's any sort of  
12 hardware, there'll be an installation process.

13 MR. PIENIAZEK: Correct.

14 MR. ZIMMERLY: That's correct.

15 JUDGE ARNOLD: And SAMDA could involve  
16 developing and implementing procedures. Correct?

17 MR. PIENIAZEK: Correct.

18 JUDGE GIBSON: As always in the nuclear  
19 field, there'll be some QA involved. Right?

20 MR. ZIMMERLY: Correct.

21 JUDGE ARNOLD: And it seems to me that  
22 ABWR is a design-certified plant, so there'll be some  
23 work involving the NRC, to get permission on some of  
24 the SAMDAs. Correct?

25 MR. ZIMMERLY: Correct.

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1 JUDGE ARNOLD: Can you think of anything  
2 else that would be a major cost in a SAMDA?

3 MR. ZIMMERLY: It's likely that labor  
4 hours would be equivalent to the other alternatives to  
5 that SAMDA, so labor probably would not be included.  
6 I can't think of any other.

7 JUDGE ARNOLD: Okay. Now, you used the  
8 Bureau of Labor Statistics Consumer Price Index for  
9 this adjustment. Correct?

10 MR. ZIMMERLY: That's correct.

11 JUDGE ARNOLD: The staff used the, what,  
12 Gross Domestic Product Implicit Price Deflator for  
13 Non-Residential Structures. And I'm just going to  
14 call that the implicit price deflator, because I will  
15 have difficulty with that otherwise. And Intervenors  
16 used the Core Personal Consumption Expenditures.

17 For engineering design analysis, do you  
18 believe that the consumer price index is -- provides  
19 the best reflection of the cost of engineering design  
20 and analysis of those three indexes?

21 MR. ZIMMERLY: No.

22 JUDGE ARNOLD: Which would be a best?

23 MR. ZIMMERLY: I believe likely the  
24 inflator that the NRC used would be the best.

25 JUDGE ARNOLD: Okay. For procurement,

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1 including manufacturing and shipping, the same  
2 question: What would be the best index?

3 MR. ZIMMERLY: Probably the NRC's  
4 inflator.

5 JUDGE ARNOLD: Installation -- and we'll  
6 include labor in that.

7 MR. ZIMMERLY: NRC's.

8 JUDGE ARNOLD: Development of procedures?

9 MR. ZIMMERLY: (No response.)

10 JUDGE ARNOLD: Which is basically  
11 engineering work and administrative.

12 MR. ZIMMERLY: That one has a lot of labor  
13 in it, but, yes, that would probably also be the  
14 NRC's.

15 JUDGE ARNOLD: QA work?

16 MR. ZIMMERLY: NRC's.

17 JUDGE ARNOLD: And if you have to  
18 interface with the NRC and there's any licensing cost?

19 MR. ZIMMERLY: NRC's.

20 JUDGE ARNOLD: Is there anything in the  
21 consumer price index that really follows any of these  
22 component pricing?

23 MR. PIENIAZEK: No.

24 MR. ZIMMERLY: No.

25 JUDGE ARNOLD: Okay. Thank you.

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1                   On page 44 to 49 of your direct testimony,  
2                   you refer to a dispatch model. Can you briefly  
3                   explain what a dispatch model is and how it works?  
4                   Very briefly, because it's a term I'm not familiar  
5                   with.

6                   MR. PIENIAZEK: Sure. In this case --  
7                   well, any dispatch model is designed to take whatever  
8                   fleet of generation you have in that particular model;  
9                   in this case it was the ERCOT fleet. And you -- each  
10                  of those different technologies have different  
11                  underlying cost structures.

12                  For example, a wind unit has basically  
13                  zero marginal cost, so it's very low. Nuclear has a  
14                  fairly low marginal cost, so it's typically next in  
15                  line to be dispatched.

16                  So you -- the dispatch model will  
17                  basically dispatch those units in merit order, to meet  
18                  whatever load that you have -- you are projecting, and  
19                  that's basically how I built this dispatch model.

20                  JUDGE ARNOLD: So it ranks your potential  
21                  sources in terms of cost to run --

22                  MR. PIENIAZEK: That's correct.

23                  JUDGE ARNOLD: -- and then just picks them  
24                  off in order.

25                  MR. PIENIAZEK: And then it dispatches

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1       them in merit order, so it would be wind and then  
2       nuclear and then coal and lignite, and you would  
3       probably get into your combined-cycle gas units, and  
4       then finally simple-cycle --

5               JUDGE ARNOLD:       And about how much  
6       experience have you had with dispatch models?

7               MR. PIENIAZEK: A lot of experience. Not  
8       so much in the past few years. I still am aware of  
9       them, but in previous job I was the director of  
10      generation planning for the City of San Antonio, and  
11      we had a lot of elaborate dispatch models at that  
12      time, and I was quite familiar with them.

13              JUDGE ARNOLD: Okay. How -- what do you  
14      consider to be the uncertainty in dispatch-model  
15      calculations? Is it a couple of percent, 10 percent?

16              MR. PIENIAZEK: Depends on the complexity  
17      of the model. The one that I put together for this  
18      particular testimony, we tested it using fuel prices  
19      from 2008, and -- because I already had an average  
20      annual wholesale price from 2008 that actually  
21      occurred, and I compared my model with it, and it was  
22      within a couple of dollars per megawatt-hour.

23              It probably -- you know, the more  
24      elaborate you make it, the more accurate it will be.  
25      Depends on the time and effort that you want to put

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1 into it, I suppose.

2 JUDGE ARNOLD: How well would a dispatch  
3 model represent power production 20 or 30 years in the  
4 future?

5 MR. PIENIAZEK: It would only be as good  
6 as the assumptions you make 20 or 30 years from now,  
7 and that's hard to do. That's extremely -- that's a  
8 long way to look out to determine.

9 So I think when you get 20, 30 years out,  
10 I don't think model results are very useful at all, to  
11 be honest.

12 JUDGE ARNOLD: Thank you. In answer 92 of  
13 your testimony, you describe your model as being  
14 conservative. What does conservative mean in this  
15 context?

16 MR. PIENIAZEK: That was 92?

17 JUDGE ARNOLD: Answer 92, page 46.

18 MR. PIENIAZEK: In this particular answer  
19 I was stating it was conservative because the  
20 ancillary services that I mentioned earlier -- the  
21 responsive reserve and the non-spin reserve and the  
22 regulation reserve -- those reserves are not energy;  
23 they're just capacity.

24 So they're there, but you don't actually  
25 have to generate any energy; they're there for

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1 contingencies.

2 But in my model I went ahead and  
3 dispatched all the way out through the ancillary  
4 services as if they were energy, so that puts you  
5 further out on the marginal cost curves by actually  
6 dispatching through them to the energy.

7 JUDGE ARNOLD: Is the ultimate consequence  
8 that your dispatch model calculates a price that is  
9 actually higher than what you --

10 MR. PIENIAZEK: That's correct, Your  
11 Honor.

12 JUDGE ARNOLD: When you purchase power,  
13 you would generally try to go for the low-cost  
14 provider. Right?

15 MR. PIENIAZEK: Yes, sir.

16 JUDGE ARNOLD: Of the plants that are not  
17 currently producing power, what are those low-cost  
18 providers?

19 MR. PIENIAZEK: Let me make sure I  
20 understand.

21 JUDGE ARNOLD: If we had four units drop  
22 out and you had to buy a large amount of power, who  
23 would those -- where would you get it from? I mean,  
24 if you're looking for low cost?

25 MR. PIENIAZEK: You would -- naturally you

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1 would buy it from other generation providers, and  
2 typically that generation provider is going to want to  
3 use their least-expensive generation for their own  
4 obligations.

5 So typically you're getting the next  
6 tranche of energy, which is at generally a higher  
7 price, and that is why, in this particular model, we  
8 used the very highest marginal clearing price as an  
9 example of the cost.

10 So the overall -- if you lost all four  
11 units, the overall wholesale price is going to go up,  
12 because you've now moved further out on your dispatch  
13 curve.

14 JUDGE ARNOLD: Does the 13.75 percent  
15 reserve margin -- does that help to control price  
16 fluctuations during periods when some generators are  
17 unable to generate power?

18 MR. PIENIAZEK: Right. I think the way I  
19 would characterize it is the 13.75 is a target  
20 planning margin. So you want to have 13.75 percent  
21 throughout the year so that you have enough operating  
22 reserves.

23 The operating reserves, each hour of every  
24 day, what really matters in the 13.75 percent is like  
25 your available generation to supply those operating

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1 reserves.

2 JUDGE ARNOLD: Okay. I want to move on to  
3 impact on consumers, was your direct testimony, page  
4 52.

5 In answer 103 of your direct testimony,  
6 you are discussing how an increase in electricity  
7 price will affect the community. Is that correct?

8 MR. PIENIAZEK: Yes, the -- in this line  
9 of questioning it is a sensitivity analysis on the  
10 impacts to consumers of a loss of all four STP units.

11 JUDGE ARNOLD: And do you consider  
12 yourself to be an expert in this area in that type of  
13 calculation?

14 MR. PIENIAZEK: Yes, sir.

15 JUDGE ARNOLD: Okay. If an increase in  
16 electricity price has an economic effect on the  
17 community, does this in turn result in any additional  
18 increase in the price of replacement power?

19 MR. PIENIAZEK: Ask it one more time?

20 JUDGE ARNOLD: Let me try to frame it  
21 better. This contention is fairly narrowly focused on  
22 the cost of replacement power.

23 Your answer in 103 was basically saying an  
24 increase in the cost of electrical power would have an  
25 effect on the community, economic losses. But I'm

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1 trying to determine if that in some way then affects  
2 the cost of electrical power, and I don't see any  
3 connection.

4 MR. PIENIAZEK: Well, this increase that  
5 I calculate shows an increase in the price when you  
6 lose those units, and that increase in price would  
7 filter down --

8 JUDGE ARNOLD: Into the community.

9 MR. PIENIAZEK: -- into the community in  
10 this particular instance, yes.

11 JUDGE ARNOLD: You have -- what's your  
12 expertise in SAMDA analysis? Did you perform this  
13 one?

14 MR. PIENIAZEK: The SAMDA analysis? No.  
15 Jeff did more of that.

16 JUDGE ARNOLD: Then I'll ask Mr. Zimmerly.  
17 Should the cost of the community be  
18 included in the SAMDA cost-versus-benefit evaluation?

19 MR. ZIMMERLY: Since the plant will not be  
20 paying those costs, no. Why would the plant want to  
21 add that to their costs if someone else is paying it?  
22 It's not a cost that they have to incur.

23 JUDGE ARNOLD: Well --

24 MR. ZIMMERLY: Unless there were fines or  
25 something along those lines. I don't see that.

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1 JUDGE ARNOLD: -- I look in a -- in the  
2 SAMDA analysis in other ones, and the offsite costs  
3 are included.

4 MR. ZIMMERLY: Correct.

5 JUDGE GIBSON: There's an offsite exposure  
6 cost and an offsite economic cost. But you're saying  
7 that offsite economic cost shouldn't be in the SAMDA  
8 evaluation?

9 MR. ZIMMERLY: The offsite economic cost  
10 included in the SAMDA evaluation is for cleaning up  
11 and interdicting food sources, cleaning people's  
12 property, compensating for that property that was  
13 damaged as a direct result of the releases of  
14 radiation.

15 It's not to repay consumers for an  
16 increase in the electricity cost and does not include  
17 that.

18 JUDGE ARNOLD: Okay. And if I were to say  
19 this cost to the community certainly shouldn't be  
20 added to the replacement power cost, you would agree  
21 with that?

22 MR. ZIMMERLY: Without a mechanism for the  
23 State of Texas to charge that to the plant, I agree  
24 with that.

25 JUDGE ARNOLD: Good answer. I believe I

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1 want to go back to Mr. Pieniazek.

2 Have you performed a sensitivity analysis  
3 to determine whether inclusion of impact to consumers  
4 would have an effect on the outcome of the SAMDA  
5 analysis?

6 MR. PIENIAZEK: Yes. Actually I  
7 calculated quite a few sensitivity analyses, and based  
8 on what was raised by Intervenors and others,  
9 basically found that, conservatism on top of  
10 conservatism on top of conservatism on top of  
11 conservatism, I still -- at the end of the analysis  
12 there was no cost-effective SAMDA.

13 JUDGE ARNOLD: Okay. Changing subject now  
14 to price spikes. According to your testimony Answer  
15 106, Price spikes are defined as when the market  
16 clearing price exceeds some specified threshold.  
17 Correct?

18 MR. PIENIAZEK: That's correct.

19 JUDGE ARNOLD: And in this case the  
20 threshold is the prevailing natural gas price times  
21 some fixed constant. Is that correct?

22 MR. PIENIAZEK: Right. That constant is  
23 the heat rate of the system. Commonly called the heat  
24 rate. It's a common term that we use.

25 JUDGE ARNOLD: So the way this definition

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1 works a price spike is always an increase?

2 MR. PIENIAZEK: A price spike is defined  
3 as -- and this is a definition that I took from the  
4 state-of-the-market report by the independent market  
5 monitor in ERCOT. It's an 18 MMBTU per megawatt heat  
6 rate times whatever the prevailing gas price, because  
7 ERCOT is typically natural gas on the margin market.

8 JUDGE ARNOLD: Uh-huh. Okay.

9 MR. PIENIAZEK: But it is an increase.

10 JUDGE ARNOLD: It's an increase.

11 MR. PIENIAZEK: It's --

12 JUDGE ARNOLD: But do you --

13 MR. PIENIAZEK: -- from typical prices.

14 JUDGE ARNOLD: Do you ever see a decrease  
15 from typical prices or is this really asymmetrical?

16 MR. PIENIAZEK: No. You do see decreases.  
17 You can even see negative prices, believe it or not.  
18 I can give you -- and example is the wind units have  
19 production tax credits that they're paid for megawatt  
20 hour of approximately \$18 a megawatt hour. And  
21 sometimes there are transmission constraints. And the  
22 wind has to drop to avoid overloading the transmission  
23 line. Well, they'll drive to negative \$5 per megawatt  
24 hour and you'll still make some money on the  
25 production tax credit. So you actually can see

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1 negative prices on the grid.

2 JUDGE ARNOLD: Okay. Is the marking --  
3 market clearing price -- is that generally fairly  
4 stabile or is there always some variation in it?

5 MR. PIENIAZEK: It's usually -- well, it's  
6 stabile if natural gas prices are stabile, which they  
7 have been. You will see fluctuations in it certainly.  
8 Just the past couple of weeks we've seen some fairly  
9 high prices because we are in an unprecedented heat  
10 and drought situation here in Texas. So we've had  
11 some fairly strong pricing during the peak hours. So  
12 you do see fluctuations in it. But most of hours of  
13 the day it's steady -- fairly steady.

14 JUDGE ARNOLD: Uh-huh. The market  
15 clearing price and the cost of natural gas. Are they  
16 typically closely related?

17 MR. PIENIAZEK: Yes. In ERCOT they are  
18 almost always -- they're related almost 24 hours a  
19 day, 365 days a year.

20 JUDGE ARNOLD: Uh-huh. So do the -- does  
21 the price spikes indicate that the market clearing  
22 price is being affected by something other than the  
23 cost of producing electricity?

24 MR. PIENIAZEK: Typically, a price spike  
25 is to do some type of anomaly on the grid.

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1 JUDGE ARNOLD: Uh-huh. And how quickly  
2 does the market clearing price normally respond to  
3 changes in the price of natural gas?

4 MR. PIENIAZEK: How quickly does it  
5 respond -- let me make sure I understand. How quickly  
6 does the market clearing price respond to a change in  
7 natural gas price?

8 JUDGE ARNOLD: Yes. Well --

9 MR. PIENIAZEK: It --

10 JUDGE ARNOLD: Let me give you an analogy.  
11 I'm not familiar with natural gas. But I -- I buy gas  
12 at the pumps. And when oil goes up the price at the  
13 pump shoots up real quick. But when the price of oil  
14 goes down I'm sitting there waiting for the price to  
15 come down and it eventually does. Is that similar to  
16 natural gas or --

17 MR. PIENIAZEK: No. I would -- thank you  
18 for the analogy. That's helpful. I would say that in  
19 ERCOT region the price goes up -- I mean, the natural  
20 gas goes up the price of power's going to go up. If  
21 the natural gas goes down price is going to go down  
22 also and it's going to happen quickly. It's a very  
23 competitive market here in ERCOT.

24 JUDGE ARNOLD: Okay. In Answer 68 on page  
25 33 of your testimony you state, "Based on the 15-

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1 minute settlement interval data for the first 11  
2 months of 2010 the average balancing energy market  
3 price across ERCOT was \$35.42 per megawatt hour."  
4 When you calculate that average balance and energy  
5 market price did you remove the price spikes or are  
6 they included in that calculation?

7 MR. PIENIAZEK: And, Your Honor, just to  
8 be clear, the prices that you just quoted were actual  
9 prices from ERCOT. These particular ones are not ones  
10 that I calculated.

11 JUDGE ARNOLD: Uh-huh.

12 MR. PIENIAZEK: Those were the actual  
13 prices from the ERCOT market for that time frame. So  
14 they would include price spikes that occurred during  
15 the year.

16 JUDGE ARNOLD: Uh-huh.

17 MR. PIENIAZEK: And in my testimony I do  
18 talk about that, that there are -- any time you use  
19 the actual price it includes the spikes that have  
20 occurred throughout the year. And they do happen.

21 JUDGE ARNOLD: Uh-huh. In fact, in the  
22 Johnson direct testimony I believe he says there's --  
23 there were -- he cites one year where there was an  
24 average of 60-some odd price spikes per month. Or a  
25 couple -- that meant well, about two a day. Is it

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1 reasonable to not include price spikes in any average  
2 that you do? I mean, people have to pay it. Correct?

3 MR. PIENIAZEK: As I've testified to, the  
4 effect of price spikes doesn't change the conclusions.

5 JUDGE ARNOLD: Uh-huh.

6 MR. PIENIAZEK: And I did account for  
7 those price spikes that Mr. Johnson mentioned.

8 JUDGE ARNOLD: Uh-huh.

9 MR. PIENIAZEK: And recalculated, add  
10 additional cost on my calculations to account for  
11 them. And it still made no difference. So --

12 JUDGE GIBSON: Just a follow-up question  
13 on that. When you say you recalculated them are you  
14 referring in your first calculations in your direct  
15 and you're saying calculations during your rebuttal or  
16 is this as a result of his affidavit that was  
17 submitted in support of the contention? I'm -- I just  
18 want to make sure I understand where you're referring  
19 to these calculations in your testimony?

20 MR. PIENIAZEK: Oh, particularly for price  
21 spikes?

22 JUDGE GIBSON: Yes. Thank you.

23 MR. PIENIAZEK: Hold on one second,  
24 please. (Perusing document.) On page 56 on my direct  
25 testimony I -- this is where I accounted for

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1 additional price spikes. And what the base line was  
2 was the highest average price that ERCOT has seen  
3 since deregulation, which was 2008. And then I  
4 added -- and so that price already had all the price  
5 spikes that occurred in 2008. And the state-of-the-  
6 market report said there was a 20 percent addition to  
7 price because of price spikes so I added another 20  
8 percent even on top of the 20 percent that was already  
9 there.

10 JUDGE GIBSON: Uh-huh.

11 MR. PIENIAZEK: So I -- the price spikes  
12 were already included but I added 20 percent more  
13 which was extremely conservative. But I did account  
14 for them in my direct.

15 JUDGE GIBSON: So this was basically in  
16 response to, in effect, the comments that Mr. Johnson  
17 put in his affidavit in support of the contention and  
18 you were addressing them in your direct testimony  
19 here?

20 MR. PIENIAZEK: Yes, Your Honor.

21 JUDGE GIBSON: And it wasn't a result of  
22 something he said in his direct testimony later? I  
23 just want to make sure the context in which you made  
24 these calculations. That's all.

25 MR. PIENIAZEK: The context that I've made

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1 all my calculations is based on what has been raised  
2 by Intervenors. And I addressed each one of them --

3 JUDGE GIBSON: Okay.

4 MR. PIENIAZEK: -- procedurally. I can't  
5 recall which document may have had it. But --

6 JUDGE GIBSON: That's okay. Obviously, if  
7 it was your direct testimony you weren't doing it in  
8 response to his direct testimony because --

9 MR. PIENIAZEK: Rebuttal.

10 JUDGE GIBSON: -- they were submitted at  
11 the same time.

12 MR. PIENIAZEK: That --

13 JUDGE GIBSON: So --

14 MR. PIENIAZEK: Yes. I did make other  
15 calculations in my rebuttal, though, that were also in  
16 response to --

17 JUDGE GIBSON: And I know that Judge  
18 Arnold probably asked you about that. But I just  
19 wanted to be sure that we had the context.

20 MR. PIENIAZEK: Yes.

21 JUDGE GIBSON: Thank you.

22 MR. PIENIAZEK: Thank you.

23 JUDGE ARNOLD: In your testimony you also  
24 mentioned the zonal market. And I guess it's now  
25 become a nodal market?

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1 MR. PIENIAZEK: Yes.

2 JUDGE ARNOLD: To your knowledge has this  
3 affected the current price spikes?

4 MR. PIENIAZEK: The reason we went to a  
5 nodal market is because it is a more efficient way to  
6 dispatch. And all else being equal, you should see --  
7 and we have seen -- lower prices, all things being  
8 equal in nodal than we did in zonal. That's the  
9 reason we went to a zonal. Zonal was a good market  
10 design but it was inefficient in the way it handled  
11 transmission congestion and the like.

12 I will say that in the nodal market we did  
13 have a period on February 2 due to an arctic cold  
14 front. We had some very high prices for a few hours.  
15 And so that kind of skews the averages. But all else  
16 being equal, you will get lower prices in nodal than  
17 you will get in zonal.

18 JUDGE ARNOLD: But my question is has it  
19 affected the occurrence of price spikes.

20 MR. PIENIAZEK: And that's why I  
21 quantified my answer, because of the February event.

22 JUDGE ARNOLD: Uh-huh.

23 MR. PIENIAZEK: And 2011 has been unusual,  
24 not only in February but it's been unusual right now,  
25 because we have exceeded all of our demand forecasts.

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1 We've had to bring back units that never were intended  
2 to run. So it's hard to say -- there's just not  
3 enough data, I don't believe, to say that the nodal  
4 market is going to be significantly lower than zonal.  
5 I just know that all else being equal and in my  
6 judgment and my experience you will get lower prices  
7 in nodal over the long run.

8 JUDGE ARNOLD: Thank you. Moving on to  
9 another issue. Buying replacement power or -- is not  
10 an unusual thing. You have to in a smaller scale do  
11 it every time you Units 1 or 2 have an outage.  
12 Correct?

13 MR. PIENIAZEK: Buying and selling power  
14 happens every day within NRG and other participants.  
15 We buy and sell all the time. And some of it's  
16 because of planned outages. Some it was because of  
17 forced outages. Some of it's just because we can get  
18 it cheaper from somebody else.

19 JUDGE ARNOLD: When you're in a period  
20 of -- let's take for instance, STP Unit 1 or 2 shut  
21 down and you're buying replacement power. Have you  
22 found that the occurrence of price spikes  
23 significantly affects your replacement power costs?

24 MR. PIENIAZEK: Not if -- are you asking  
25 about a planned outage or a --

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1 JUDGE ARNOLD: A planned outage.

2 MR. PIENIAZEK: A planned outage you won't  
3 get much of a change at all. Our purchasers of power  
4 are the folks that do that for a living. They know  
5 when our outages are coming up months in advance. So  
6 they might buy power ahead of time and get a very good  
7 price for that knowing when the outage is going to be.  
8 And that's -- so, you don't see much of a change in  
9 market prices when you can plan ahead. And the only  
10 time you really see a hiccup is on a -- say, a unit  
11 trip. And it usually lasts a very short amount of  
12 time.

13 JUDGE ARNOLD: Okay. Would examining  
14 long-term energy price trends in the ERCOT region be  
15 a viable means of estimating replacement power costs  
16 some day in the future?

17 MR. PIENIAZEK: I don't think it would be.  
18 As I said earlier, projecting power costs in the  
19 future is a difficult proposition. It can be -- it is  
20 done. We do that. But there's a lot of uncertainty  
21 there. There -- and it's just hard to do consistently  
22 well, I would say.

23 JUDGE ARNOLD: Okay. On page 11 of Mr.  
24 Johnson's rebuttal testimony he contends that in the  
25 long-term the natural gas price will escalate faster

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1 than inflation. I believe that -- well, do you agree  
2 with that?

3 MR. PIENIAZEK: No, sir. I don't.

4 JUDGE ARNOLD: And why not?

5 MR. PIENIAZEK: Hold on one second. I  
6 recall answering a similar question. (Perusing  
7 document.) Hold on one second. I'm looking for Table  
8 6 in my testimony, because that table illustrates how  
9 pricing in ERCOT, which is based predominantly on  
10 natural gas doesn't follow any type of normal  
11 pattern -- normal economic indicator pattern. You  
12 can -- I'm sorry.

13 JUDGE GIBSON: It appears to me Table 6  
14 may be displayed. Is that what you were looking for?

15 MR. PIENIAZEK: Oh, yes. Thank you.

16 JUDGE GIBSON: Surely.

17 MR. PIENIAZEK: Yes. I think if Mr.  
18 Johnson was correct we wouldn't see 2010 prices and  
19 2009 prices being lower than 2004 and 2005. Those are  
20 ERCOT actual prices. As I mentioned earlier, they're  
21 based on natural gas. And natural gas has fluctuated  
22 tremendously. It doesn't really follow any kind of  
23 normal economic indicator. Now, I also testified that  
24 it looks like, based on shell gas finds that natural  
25 gas a fairly stabile and flat future projection based

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1 on the Energy Institute projections. So they at least  
2 forecast it's going to be stabile in the near future.

3 JUDGE ARNOLD: Uh-huh.

4 MR. PIENIAZEK: But they probably said  
5 that in 2003, as well.

6 JUDGE ARNOLD: In the way you performed  
7 the SAMDA analysis does the future cost of natural gas  
8 actually figure into it somewhere?

9 MR. PIENIAZEK: The future cost?

10 JUDGE ARNOLD: Yes.

11 MR. ZIMMERLY: Which SAMDA analysis would  
12 that be? Would that be the one --

13 MR. PIENIAZEK: I did so many.

14 MR. ZIMMERLY: -- presented in the --

15 MR. PIENIAZEK: I did so many I can't --

16 MR. ZIMMERLY: -- or the additional  
17 calculations that we did afterwards?

18 JUDGE ARNOLD: I -- well --

19 MR. ZIMMERLY: For the most part you want  
20 to get the SAMDA cost and the SAMDA benefit to the  
21 same time frame.

22 JUDGE ARNOLD: Uh-huh.

23 MR. ZIMMERLY: And that -- so that's what  
24 all the calculations were doing.

25 MR. PIENIAZEK: I've seen --

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1 MR. ZIMMERLY: So I didn't project any  
2 future power costs.

3 JUDGE ARNOLD: Okay. Having to do with  
4 the -- on -- Mr. Johnson, on page 12 of his rebuttal,  
5 discusses the ERCOT Long-Term Planning Task Force  
6 report of May 2011. He cites this reference to  
7 support a future locational, marginal price of \$87.75  
8 per megawatt hour in 2030. Are you familiar with  
9 that?

10 MR. PIENIAZEK: I'm familiar with his  
11 rebuttal. And I did --

12 JUDGE ARNOLD: Okay. What -- does that  
13 have any -- what meaning would that have with respect  
14 to your SAMDA analysis?

15 MR. PIENIAZEK: None. No, because I --  
16 the way that my calculations fell on top of each  
17 other, I kept adding in what was raised by the  
18 Intervenors, I accounted for situations that exceeded  
19 this amount sometimes. So I would say it would have  
20 no effect on this analysis.

21 JUDGE ARNOLD: Thank you. Moving on to  
22 loss of grid that was also brought up by Intervenors,  
23 are you qualified to answer questions concerning loss  
24 of grid cause and effects and --

25 MR. PIENIAZEK: Yes, I feel like I -- I've

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1 never experienced one, because we've never had one  
2 here in ERCOT. But I certainly know why they -- you  
3 know, why we carry reserves and how the transmission  
4 grid works and things like that.

5 JUDGE ARNOLD: Uh-huh. And -- you  
6 answered my third question.

7 MR. PIENIAZEK: Oh.

8 JUDGE ARNOLD: Second question: How long  
9 have you been in this industry?

10 MR. PIENIAZEK: Right at 28 years.

11 JUDGE ARNOLD: Yes. Going to the loss of  
12 generation that occurred here February 2, you  
13 previously said that that was due to extreme weather.  
14 Correct?

15 MR. PIENIAZEK: That's correct.

16 JUDGE ARNOLD: Are the events that caused  
17 the loss of generation in February similar to the  
18 events being considered here in the SAMDA analysis,  
19 that being a severe accident at one of the units  
20 causing the controlled shut down of the other three?  
21 Is there any similarity?

22 MR. PIENIAZEK: Yes. I would say that the  
23 actual events of February are quite similar to what  
24 we're trying to analyze here. Other than in February  
25 we actually lost more generation. The sum was around

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1 7,000 megawatts, which exceeds the amount of all four  
2 STP units. So it was a good case study of what we're  
3 trying to analyze here. And everything went well in  
4 February.

5 JUDGE ARNOLD: Do the events of -- in  
6 February indicate that a loss of STP -- one of the STP  
7 units followed by the shut down of the rest -- do  
8 those -- did the February incident suggest that loss  
9 of STP would result -- that it would likely result in  
10 a loss of the grid?

11 MR. PIENIAZEK: No, I wouldn't say that.  
12 I would say that the February event was a large loss  
13 of generation that exceeded the value of the four STP  
14 units. And it was during a very high load demand  
15 period. It was extremely cold and we had very high  
16 demand. And so I think it's -- it's almost a worse  
17 situation.

18 Now, I'm not trying to understate the loss  
19 of STP units. That would certainly be a significant  
20 event. But that case study proves that it can be  
21 handled quite well and that the effect on wholesale  
22 prices is very short term in duration. The wholesale  
23 market responded. We brought on units that were able  
24 to meet the load. Now, there was some load shed.  
25 ERCOT had to take some actions. But the grid remains

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1 stabile.

2 JUDGE ARNOLD: Uh-huh.

3 MR. PIENIAZEK: And we got out of it  
4 within, you know, six, seven, eight hours.

5 JUDGE ARNOLD: Okay. In the February  
6 event did the ERCOT responsive reserve capacity fall  
7 below the minimum reserve capacity requirements?

8 MR. PIENIAZEK: Yes, it did fall below the  
9 2,300 megawatt requirement. I don't recall for how  
10 long. I can find out. But it was an hour or two, I  
11 believe.

12 JUDGE ARNOLD: Okay. And in February how  
13 long  
14 did it take to get the grid restored with alternate  
15 power supplies and all or --

16 MR. PIENIAZEK: My recollection is that --  
17 and when you say restored what I would characterize  
18 that is that all the load is now being served again.  
19 And from about 5:30 a.m. on February 2 to  
20 approximately 11:00 a.m. ERCOT did have some rolling  
21 outages. The maximum was 4,000 megawatts. But I  
22 believe by 11:00, approximately five or six hours  
23 later, all load was being served again. And they were  
24 able to restore all load. And it remained that way  
25 for the next few days even though it remained very

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1 cold for the next few days.

2 JUDGE ARNOLD: Uh-huh. Do you know of any  
3 grid outages in the U.S. that have been caused by a  
4 shutdown -- unexpected shutdown of a nuclear power  
5 plant?

6 MR. PIENIAZEK: I'm not aware of any. I  
7 know the northeast blackout was trees on lines or  
8 something that caused a cascading. But it wasn't  
9 nuclear related. That's the one that sticks in my  
10 head because it was 2003. But I -- no. I mean, the  
11 short answer to your question is, no, I'm not aware of  
12 any.

13 JUDGE ARNOLD: Okay. Does the  
14 potential -- or should the potential for a grid outage  
15 be considered in a SAMDA analysis?

16 MR. PIENIAZEK: I --

17 MR. ZIMMERLY: No.

18 MR. PIENIAZEK: Thank you. We did it  
19 because it was raised and -- as a contention. But  
20 I'll let Jeff answer that one.

21 JUDGE ARNOLD: Going to -- let's see.  
22 Your rebuttal testimony on page 11, you have a table  
23 that lists calculated replacement power costs for  
24 several sets of assumptions?

25 MR. PIENIAZEK: Yes, Your Honor.

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1 JUDGE ARNOLD: If we could get that on  
2 the --

3 JUDGE GIBSON: I believe it's on page 11  
4 of the rebuttal.

5 JUDGE ARNOLD: Now, what vintage dollars  
6 are those listed in? What year is this?

7 MR. PIENIAZEK: This is -- I mean, it  
8 depends on which line of the table. Like, for  
9 example, the first line was 1993 dollars. And then as  
10 we ran through the different scenarios --

11 JUDGE ARNOLD: Oh.

12 MR. PIENIAZEK: -- we used different time  
13 frames.

14 MR. ZIMMERLY: I believe the ones that are  
15 unmarked are 2009. I can confirm that.

16 MR. PIENIAZEK: Yes.

17 JUDGE ARNOLD: And these are compared --  
18 let's see -- what year is the cost versus benefit made  
19 in? What dollars?

20 MR. PIENIAZEK: I --

21 JUDGE ARNOLD: These -- this is the  
22 monetized -- the impacts. Right? And you have to  
23 compare that with the cost of implementing the SAMDA?

24 MR. PIENIAZEK: Right. And we started at  
25 the top, as it's indicated, using the replacement of

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1 the power cost in 1993 dollars. And the SAMDA was in  
2 '91 dollars.

3 JUDGE ARNOLD: Okay.

4 MR. PIENIAZEK: And then we, you know,  
5 added on to that. But each time we were comparing,  
6 you know, replacement power costs and the like at the  
7 same time frame as the SAMDA costs, so some of them --

8 JUDGE ARNOLD: The --

9 MR. PIENIAZEK: -- were 2009; some, I  
10 think, were 2008.

11 JUDGE ARNOLD: So the --

12 MR. PIENIAZEK: This --

13 JUDGE ARNOLD: Oh, I'm sorry.

14 MR. PIENIAZEK: Go ahead.

15 JUDGE ARNOLD: You adjusted the SAMA  
16 implementation cost for each one of them to be  
17 appropriate?

18 MR. PIENIAZEK: That's correct. The SAMDA  
19 cost?

20 JUDGE ARNOLD: Yes.

21 MR. PIENIAZEK: Yes.

22 MR. ZIMMERLY: I believe the SAMDA costs  
23 were in 2009 dollars, unless we compared the Table 2  
24 values, which were still in 1991 dollars.

25 MR. PIENIAZEK: It depends on the scenario.

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1 MR. ZIMMERLY: So what was in the ER had  
2 1991 dollars, because that's what the SAMDA costs were  
3 given to us from the TSD. And 1993 dollars is the  
4 replacement power costs from NUREG/BR-0184. But since  
5 then I believe we -- our SAMDA costs were escalated to  
6 2009 dollars. And we may have done a 2008 in that  
7 year, but most of the time the 2009 dollars, the  
8 \$93,000 -- 982,500 is in 2009.

9 MR. FRANTZ: Mr. Zimmerly, you referred to  
10 ER and TSD. Could you define those terms for the  
11 record, please.

12 MR. ZIMMERLY: Yes. The TSD is the  
13 Technical Support Document and the ER is environmental  
14 report.

15 JUDGE GIBSON: Thank you, Mr. Frantz. I  
16 was just about to ask the same question.

17 To the extent there are some witnesses  
18 here that hear that -- you know, to the extent you can  
19 not use acronyms, it would really be helpful for the  
20 record. Thank you.

21 It's noon. We probably ought to break for  
22 lunch. We'll recess until 1:30. If there's nothing  
23 else, we'll see you at 1:30. Thank you.

24 (Whereupon, at 12:00 p.m., the hearing was  
25 recessed, to reconvene at 1:30 p.m.)

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A F T E R N O O N     S E S S I O N

1:30 p.m.

JUDGE GIBSON: Judge Arnold, before you resume your examination of the witnesses, I've got a couple of things I need to note.

It's my understanding that during the lunch break Mr. Eye and Mr. Welkie were, I think, able to put together the two exhibits. If we could -- could we call up Intervenor's revised Exhibit 001?

Now, this is the new exhibit that hopefully -- would you scroll down just a little bit -- contains the direct testimony of Mr. Mosenthal.

Is that correct, Mr. Eye?

MR. EYE: Yes, it is.

JUDGE GIBSON: And there's a page 18 to this?

MR. EYE: There's a page 13.

JUDGE GIBSON: There's a page 13. And the lines are stricken that you intended to strike and the lines are not stricken that you didn't intend to strike. Is that a fair statement?

MR. EYE: Yes, sir.

JUDGE GIBSON: Okay. Are there any other changes to this exhibit, Mr. Eye?

MR. EYE: I don't believe that -- I think

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1 that was the extent of the changes we needed to make.

2 JUDGE GIBSON: Okay.

3 Any objection to this exhibit in this form  
4 now?

5 MR. SPENCER: No, Your Honor.

6 JUDGE GIBSON: Mr. Frantz?

7 MR. FRANTZ: No.

8 JUDGE GIBSON: Okay.

9 Then it will be admitted as Intervenor's  
10 Exhibit R-20001.

11 (The document referred to  
12 was marked for identification as  
13 INTR20001 and received in  
14 evidence.)

15 JUDGE GIBSON: Now, could you please call  
16 up Intervenor's Exhibit R20045?

17 This is the rebuttal testimony of Mr.  
18 Johnson. Is that correct, Mr. Eye?

19 MR. EYE: Yes, it is, sir.

20 JUDGE GIBSON: Okay. And if we could turn  
21 to page 18. Does this have -- is this page 18 that  
22 should have been in here?

23 MR. EYE: Yes, sir.

24 JUDGE GIBSON: Okay. And is the affidavit  
25 to this attached?

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1 MR. EYE: Yes, sir.

2 JUDGE GIBSON: Okay.

3 MR. EYE: Although it's rotated --

4 JUDGE GIBSON: All right.

5 MR. EYE: -- it is.

6 JUDGE GIBSON: That's okay. Is this  
7 everything that was changed to this exhibit?

8 MR. EYE: Yes, sir.

9 JUDGE GIBSON: Okay.

10 Mr. Spencer, any objection?

11 MR. SPENCER: No objections.

12 JUDGE GIBSON: Mr. Frantz?

13 MR. FRANTZ: No.

14 JUDGE GIBSON: Okay.

15 So this exhibit will be admitted as  
16 Intervenor's Exhibit R000045.

17 (The document referred to  
18 was marked for identification as  
19 INTR20045 and received in  
20 evidence.)

21 MR. EYE: Thank you, Your Honor.

22 JUDGE GIBSON: Now, by doing this are we  
23 withdrawing -- are you withdrawing Intervenor's  
24 Exhibit 1 and Intervenor's Exhibit 45 and 45R and 1R?

25 MR. EYE: Yes, sir.

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1 JUDGE GIBSON: Okay. So we all set there  
2 on that? Okay.

3 Now, I just have one other question. Mr.  
4 Welkie, do we need a revised exhibit list or are we  
5 okay?

6 MR. WELKIE: No, we're good.

7 JUDGE GIBSON: We're good to go. Okay.

8 If you would just make a handwritten note  
9 on your exhibit list that these things have been put  
10 in in case you have any questions that should suffice.

11 Is there anything else before we resume  
12 the examination of these witnesses? Oh, I think three  
13 is one other thing. Apparently, we are not going to  
14 be able to connect Mr. Mosenthal via Skype. And we'll  
15 probably have to do this by telephone. So if anything  
16 changes in the interim well, we'll let you know. But  
17 that is apparently what we'll have to be doing  
18 tomorrow.

19 MR. EYE: Thank you.

20 JUDGE GIBSON: Okay.

21 Thank you, Judge Arnold.

22 JUDGE ARNOLD: Could I have displayed the  
23 direct testimony here? Exhibit STP-11. And page 64.  
24 Now, this is Table 11 of your direct testimony. And  
25 it's quite a extensive list of monetized impacts and

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1 SAMDA costs for a variety of assumptions. Is one of  
2 these entries what you would consider to be the most  
3 reasonable estimate of replacement costs?

4 MR. PIENIAZEK: Give me one second to --

5 JUDGE ARNOLD: Okay.

6 MR. ZIMMERLY: The first two lines -- the  
7 first two entries in that table, the one being the  
8 1993 dollars and then the ones escalated to 2009  
9 dollars, either of those would be the most reasonable.

10 JUDGE ARNOLD: Okay. So the basis of  
11 those is the new reg, BR-0184?

12 MR. ZIMMERLY: That is correct.

13 JUDGE ARNOLD: And that's a better basis  
14 than either the 2008 or 2009 ERCOT prices?

15 MR. ZIMMERLY: Correct.

16 JUDGE ARNOLD: I'm surprised at that,  
17 though. Could you tell me why the new reg is -- gives  
18 you a more reasonable result?

19 MR. ZIMMERLY: The -- well, the most  
20 reasonable result would be the new reg value. We've  
21 included the rest of these values as a sensitivity  
22 analysis to respond to the Intervenor's comments on  
23 our analysis. And we believe the most reasonable  
24 value would be the value we had originally given.

25 JUDGE ARNOLD: Okay. And does this most

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1 reasonable value include any market effects?

2 MR. ZIMMERLY: No.

3 JUDGE ARNOLD: Does it include effect of  
4 price spikes?

5 MR. ZIMMERLY: No.

6 JUDGE ARNOLD: Is there any accounting for  
7 grid outages?

8 MR. ZIMMERLY: No.

9 JUDGE ARNOLD: And is there any accounting  
10 for consumer impacts?

11 MR. ZIMMERLY: No.

12 JUDGE ARNOLD: Okay. In his rebuttal  
13 testimony Mr. Johnson on page 10 advanced his opinion  
14 of replacement power costs. He calculated a cost of  
15 \$68.39 per megawatt hour in 2010 based on NRG revenues  
16 of \$3.057 billion and sales of 44.7 megawatt hours.  
17 Are you familiar with that calculation?

18 MR. ZIMMERLY: Yes, I'm familiar with that  
19 calculation.

20 JUDGE ARNOLD: Do you agree with it?

21 MR. ZIMMERLY: No, I do not.

22 JUDGE ARNOLD: And why not?

23 MR. ZIMMERLY: The -- he took this value  
24 from -- make sure I'm on the right one. This is from  
25 the 10k report. Correct? Where he took the --

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1 JUDGE ARNOLD: Yes. He took --

2 MR. ZIMMERLY: Yes.

3 JUDGE ARNOLD: -- some numbers out of a  
4 table.

5 MR. ZIMMERLY: Yes. That -- let me find  
6 the exhibit first. (Perusing document.)

7 JUDGE ARNOLD: Yes. Exhibit Intervenor's  
8 50. I believe the NRG 2010 Annual Report.

9 MR. ZIMMERLY: Right. No. The numbers  
10 that he used for revenues are not all related to power  
11 production. There are revenues that NRG has in other  
12 endeavors that add --

13 JUDGE ARNOLD: Just --

14 MR. ZIMMERLY: -- revenue --

15 JUDGE ARNOLD: One moment.

16 Andy, can you go down one page? There  
17 should be a --

18 MR. ZIMMERLY: Oh.

19 JUDGE ARNOLD: This is the full one.

20 MR. ZIMMERLY: It's page 15, I believe.

21 JUDGE ARNOLD: I think so, yes. Okay.  
22 That's the -- is that the table?

23 MR. ZIMMERLY: Yes. As -- an example of  
24 what's wrong with this calculation is -- just one  
25 example. We have a trading floor that buys and sells

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1 power all the time. And if I buy 100 megawatts today  
2 for \$30 and then I sell it three days from now for \$5  
3 more I made money on that transaction but I didn't  
4 produce any megawatts at all. There was no megawatts  
5 related to that. And he took our actual generation  
6 and divided it by revenues that include much more than  
7 just the revenues from power sales.

8 Another example is we are a large buyer  
9 and seller of coal. And we sometimes have excess  
10 inventory. And we have other entities that are short  
11 sometimes. And we will divert trains and sell that  
12 coal to other entities. And that's a revenue but it  
13 has nothing to do with the generation that our power  
14 plants produced.

15 JUDGE ARNOLD: Okay. From the information  
16 available here could a person that is knowledgeable on  
17 this table and the way you operate calculate a  
18 reasonable average cost from these numbers? Or is  
19 that --

20 MR. ZIMMERLY: Not a reasonable average  
21 cost of wholesale power, no.

22 JUDGE ARNOLD: Mr. Johnson also makes some  
23 arguments concerning cost of power in the year 2060.  
24 Are forecasts of electrical power costs 50 years  
25 away -- are they -- do you know of any credible

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1 calculations of that sort?

2 MR. ZIMMERLY: Predicting power costs two  
3 years from now is difficult. Sixty years would be  
4 impossible, in my opinion. I just -- there's  
5 absolutely no way you could credibly do it, in my  
6 opinion. There's just too much that can happen in  
7 that amount of time frame.

8 JUDGE ARNOLD: Uh-huh. Would you agree  
9 that in circumstances of low reserve margins pivotal  
10 generators are able to charge higher prices compared  
11 to during circumstances when reserve margins are high?

12 MR. ZIMMERLY: And just so I'm clear, the  
13 reserve margins you're talking about -- well, there's  
14 operating reserves and then there's planning reserves.  
15 But you're talking about, I guess, operating -- when  
16 we're real -- in real time and it's tight --

17 JUDGE ARNOLD: That's correct.

18 MR. ZIMMERLY: Good description. I think  
19 theoretically when you are tight power the load is  
20 high and you've had some maybe, you know, generators  
21 that aren't producing as much as they could just about  
22 anybody can be pivotal. And I think at those time  
23 frames, yes, there can be -- there's definitely an  
24 opportunity to set prices at a higher value.

25 I think -- in fact, I -- the market design

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1 we have here in ERCOT even allows certain generation  
2 entities to bid high prices as long as they don't own  
3 a certain amount of generation. But even those  
4 generators can be pivotal if things are tight.

5 JUDGE ARNOLD: Uh-huh.

6 MR. ZIMMERLY: So I -- you know, that's  
7 maybe too much detail. But, yes, if things are tight  
8 prices can -- are going to be higher.

9 JUDGE ARNOLD: Are there any limits on  
10 that regulatory or --

11 MR. PIENIAZEK: Yes. There is a -- an  
12 offer cap. You cannot exceed \$3,000 per megawatt  
13 hour. And I might add just from my personal  
14 experience there are certain generators that have a  
15 certain size in ERCOT. NRG is one of them. Luminant.  
16 Calpine, City of San Antonio. They're a fairly decent  
17 size. And so oftentimes they may be more pivotal than  
18 some of the smaller ones.

19 And just my personal experience -- we have  
20 an independent market monitor here in ERCOT that I  
21 believe is one of the smartest and most diligent  
22 market monitors in any region. And there is no way,  
23 in my opinion, that any of those entities could get  
24 away with anything remotely similar to, you know, a  
25 market power type situation. He watches those very

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1 closely. He has my personal phone number. I see him  
2 all the time and so do the other generation entities.

3 JUDGE ARNOLD: Thank you.

4 Do you personally have experience with the  
5 environmental reviews, other than the SAMDA analysis?

6 MR. PIENIAZEK: No, I don't -- I do not  
7 have any experience with environmental reviews.

8 JUDGE ARNOLD: Uh-huh.

9 MR. PIENIAZEK: Jeff does.

10 MR. ZIMMERLY: I do.

11 JUDGE ARNOLD: Well, what has been your  
12 involvement in the past? How extensive is your  
13 knowledge?

14 MR. ZIMMERLY: With Tetra Tech I've  
15 performed many ERs and EISs. But for the DOE, the NRC  
16 performed five or six COLAs and worked on 20 or 30  
17 license renewal ERs.

18 JUDGE ARNOLD: Okay. And these reviews  
19 have been performed in order to satisfy the  
20 requirements of the National Environmental Policy Act.  
21 Correct?

22 MR. ZIMMERLY: Right.

23 JUDGE ARNOLD: So you're familiar with  
24 NEPA?

25 MR. ZIMMERLY: Yes.

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1 JUDGE ARNOLD: In general, the National  
2 Environmental Policy Act requires a reasonable  
3 evaluation of the outcome of a government action.  
4 Does this agree with your understanding of NEPA?

5 MR. ZIMMERLY: Yes.

6 JUDGE ARNOLD: The SAMDA analysis is part  
7 of the Environmental Impact Statement. Can a  
8 reasonable SAMDA evaluation be performed without  
9 considering potential market manipulation that would  
10 be extreme enough to affect the outcome? Does NEPA  
11 require you to consider such market action?

12 MR. ZIMMERLY: I do not believe that NEPA  
13 requires that.

14 JUDGE ARNOLD: So consideration of market  
15 manipulation is not reasonable within the context of  
16 NEPA?

17 MR. ZIMMERLY: I would agree with that.  
18 Yes.

19 JUDGE ARNOLD: Okay. I want to discuss  
20 the cost of implementing SAMDAs. Who would be most --  
21 okay. Great. Okay. You've just detailed your  
22 experience in that area. In your direct testimony on  
23 page 23 you introduced the concept that in general the  
24 SAMDA alternatives do not avert all core damage.

25 MR. ZIMMERLY: Correct.

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1 JUDGE ARNOLD: From this you conclude that  
2 the original averted accident cost provided in the  
3 environmental report are significantly conservative.  
4 Correct?

5 MR. ZIMMERLY: Correct.

6 JUDGE ARNOLD: By conservative it means  
7 that they are higher than the actual values would be,  
8 the cost --

9 MR. ZIMMERLY: Yes.

10 JUDGE ARNOLD: The averted costs were  
11 higher than they would actually be?

12 MR. ZIMMERLY: That's correct.

13 JUDGE ARNOLD: In the current cost benefit  
14 analysis provided in your testimony you accounted for  
15 this difference for some of the SAMDAs by increasing  
16 the SAMDA cost rather than by reducing the SAMDA  
17 benefit. Is that correct?

18 MR. ZIMMERLY: That's correct.

19 JUDGE ARNOLD: Why is it appropriate to  
20 increase the SAMDA cost to account for a reduced  
21 benefit?

22 MR. ZIMMERLY: In this case, for this  
23 demonstration for this hearing we felt that increasing  
24 the SAMDA cost would be a easier understandable  
25 calculation than to decrease the SAMDA benefit.

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1 JUDGE ARNOLD: Okay. Now, this accounting  
2 for the fact that all of the risk is not averted, does  
3 that account for the lowest cost SAMDA going from a  
4 cost of \$158,000 to \$982,500?

5 MR. ZIMMERLY: No, it does not. The  
6 reason why the SAMDA went from \$100,000 to \$982,000 is  
7 because we applied the risk to that specific SAMDA to  
8 that SAMDA benefit. Originally, we applied the risk  
9 of the entire ABWR, the Advanced Billing Water Reactor  
10 CDF to the entire suite of SAMDAs. And in this case  
11 we're actually breaking out the individual CDFs that  
12 are associated with the SAMDA themselves.

13 JUDGE GIBSON: You used an acronym there,  
14 CDF.

15 MR. ZIMMERLY: CDF.

16 JUDGE GIBSON: Would you please make that  
17 clear what you're talking about?

18 MR. ZIMMERLY: That is the Core Damage  
19 Frequency.

20 MR. PIENIAZEK: Your Honor, may I have  
21 just a second to chat with him for a second?

22 JUDGE ARNOLD: Okay.

23 MR. ZIMMERLY: One correction. The SAMDA  
24 value didn't go from 100,000 to 982,500. The -- that  
25 SAMDA changed to another value. The \$750,000 SAMDA

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1       went to 982,500.

2               JUDGE ARNOLD:   Uh-huh.

3               MR. ZIMMERLY:   But that then became the  
4       lowest cost beneficial SAMDA --

5               JUDGE ARNOLD:   Uh-huh.

6               MR. ZIMMERLY:   -- based on risk.

7               JUDGE ARNOLD:   Okay.   In his rebuttal  
8       testimony Mr. Johnson challenges adjusting the cost --  
9       or the cost of SAMDAs.   And he states, "The staff and  
10      applicant have not provided adequate support for their  
11      assumption that measures which mitigate rather than  
12      prevent core damage have no effect on co-located units  
13      or off-site replacement power."   I want to look into  
14      that statement a bit.

15              The cost of a severe accident is reduced  
16      when the -- by -- or in your case looking at the  
17      reduction in Core Damage Frequency when the SAMDA is  
18      implemented.   Correct?

19              JUDGE GIBSON:   Will you be sure and give  
20      a verbal answer, rather than a nod of your head,  
21      because the court reporter can't pick that up.

22              MR. ZIMMERLY:   Oh, yes.   I wasn't  
23      answering it.   I was --

24              JUDGE GIBSON:   Thank you.

25              MR. ZIMMERLY:   Could you repeat the

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1 question?

2 JUDGE ARNOLD: The cost of a severe  
3 accident is reduced when the -- when implementation of  
4 the SAMDA reduces the Core Damage Frequency. Right?

5 MR. ZIMMERLY: The cost benefit of the  
6 SAMDA -- the overall -- well, I do not believe that  
7 those two follow each other, because the cost benefit  
8 of a SAMDA being reduced would not have any relation  
9 to the whole -- it's the whole plant's cost that would  
10 drop if you implemented a SAMDA, not the individual  
11 SAMDA cost. So I'm not sure that --

12 JUDGE ARNOLD: I'm not sure I'm getting  
13 my --

14 MR. ZIMMERLY: That was the same --

15 MR. PIENIAZEK: -- question across --

16 MR. ZIMMERLY: Right.

17 JUDGE ARNOLD: -- real well. So let me  
18 continue. Let's see. On page 26 of your direct  
19 testimony, let's see, there's a Table 3 that lists all  
20 the SAMDAs having implementation costs of \$750,000 or  
21 less in 1991 dollars. Correct?

22 MR. ZIMMERLY: That is correct.

23 JUDGE ARNOLD: Great. And I believe what  
24 you did was you demonstrated the low cost SAMDAs  
25 adjusted for the -- their respective risk reduction

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1 would yield an effective cost greater than 750,000.

2 MR. ZIMMERLY: That is correct.

3 JUDGE ARNOLD: And then you used 750,000  
4 as the lowest -- lower bound on implementing any  
5 SAMDA?

6 MR. ZIMMERLY: That is correct.

7 MR. PIENIAZEK: Oh, Your Honor, I  
8 apologize for interrupting. But -- and that 750,000  
9 conservatively assumes a 100 percent reduction in Core  
10 Damage Frequency.

11 MR. ZIMMERLY: Of the entire plant.

12 JUDGE ARNOLD: Okay. Is reducing the Core  
13 Damage Frequency the only way in which a SAMDA could  
14 affect the probability-weighted cost of a severe  
15 accident? Would really -- would reducing the vision  
16 product release but maintaining the same Core Damage  
17 Frequency change the cost of the severe accident?

18 MR. ZIMMERLY: Yes it would.

19 JUDGE ARNOLD: So basically you have  
20 assumed that a reduction due to mitigative properties  
21 is negligible -- or is small?

22 MR. ZIMMERLY: I believe that's what the  
23 NRC did. What we did is if there was any CDF we had  
24 assumed that that entire CDF was removed. So if you  
25 implemented a SAMDA with a CDF -- a low CDF you would

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1 not have that accident happening at all. When, in  
2 fact, most of these SAMDAs only mitigate the effect.  
3 In other words, it would be a reduced cost, not  
4 eliminating the cost altogether.

5 JUDGE ARNOLD: Uh-huh.

6 MR. ZIMMERLY: So we've zeroed out the  
7 cost.

8 JUDGE ARNOLD: Okay. I want to go through  
9 the SAMDAs in this table.

10 MR. ZIMMERLY: Okay.

11 JUDGE ARNOLD: The first one, SAMDA 1-A,  
12 Severe Accident Emergency Procedure Guidelines and  
13 Accident Mitigation Guidelines. Now, in this table  
14 you say there is no reduction in the Core Damage  
15 Frequency. Correct?

16 MR. ZIMMERLY: That is correct.

17 JUDGE ARNOLD: Looking at the Technical  
18 Support Document, Section A.4.1.1 makes the statement,  
19 "Currently, the EPGs are under revision and accident  
20 management guidelines are being developed for severe  
21 accidents. These should provide a significant  
22 improvement which reduces the likelihood of a severe  
23 accident." To me, that would suggest that the SAMDA  
24 actually has been implemented. Is my impression  
25 correct?

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1 MR. ZIMMERLY: Could you give me a moment  
2 to find that?

3 MR. PIENIAZEK: Can you repeat the  
4 reference?

5 JUDGE ARNOLD: Excuse me?

6 MR. PIENIAZEK: The exhibit that you  
7 mentioned -- or the TSD I know. The page number?

8 JUDGE ARNOLD: It's from the Technical  
9 Support Document.

10 MR. ZIMMERLY: What page was that? Do you  
11 know?

12 JUDGE GIBSON: Do you have, Andy, what the  
13 exhibit number for the Technical Support Document is?

14 JUDGE ARNOLD: 7.B -- 7.A or 7.B.

15 MR. SPENCER: I believe it's NRC 9.B in  
16 this case.

17 JUDGE ARNOLD: 9.B.

18 MR. SPENCER: NRC 9.5.

19 MR. FRANTZ: Yes. And I believe that the  
20 discussion is Severe Accident Guidelines -- Management  
21 Guidelines is on page 36 and 37.

22 JUDGE GIBSON: Does that look like it? Is  
23 this the page you're looking for?

24 MR. ZIMMERLY: Yes.

25 JUDGE GIBSON: Okay.

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1 JUDGE GIBSON: Just a minute. I think the  
2 record should reflect the witness is looking at  
3 Exhibit Number --

4 What is it, Mr. Frantz?

5 MR. FRANTZ: NRC 9.5.

6 JUDGE GIBSON: At pages 37 and 38?

7 MR. FRANTZ: 36 and 37.

8 JUDGE GIBSON: 36 and 37.

9 MR. ZIMMERLY: Okay. Could you repeat the  
10 question again?

11 JUDGE ARNOLD: Well, the passage in the  
12 Technical Support Document sounds to me like they were  
13 in the process of implementing that SAMDA when the  
14 original SAMA analysis was being performed by the  
15 vendor. So I get the impression that this SAMA has  
16 been implemented. Not by you but by GE.

17 MR. ZIMMERLY: I believe that there are  
18 EPGs, the -- sorry -- the Emergency Procedure  
19 Guidelines and the Accident Management Guidelines that  
20 go along with the ABWR.

21 JUDGE ARNOLD: Okay.

22 MR. ZIMMERLY: There would be site-  
23 specific additional documents, I believe, that would  
24 go along with the site. But as a plant, yes.

25 JUDGE GIBSON: Just for clarification's

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1     sake we're talking about something that would be  
2     resolved as part of this design as opposed to  
3     something that would be site-specific. Are the site-  
4     specific costs, if you will, that are -- that you're  
5     referring to -- they're not -- I assume they're  
6     nothing like the order of magnitude that they're  
7     talking about here. Is that right?

8                     You -- the -- what you're talking about  
9     when you're talking about the cost of this particular  
10    item that's going to be resolved as part of the  
11    design, it may be reflected in this table. But  
12    something that's site-specific, I take it would be  
13    something -- it would be a -- comparatively, a  
14    relatively minimal cost. Is that a fair statement?

15                    MR. ZIMMERLY: Yes, I believe so.

16                    JUDGE GIBSON: Okay. I just wanted to be  
17    sure that was clear. So the site-specific piece is  
18    not reflected in this table but it's something that's  
19    relatively small. If this is resolved by the  
20    design -- that's the reason it's on here. But it  
21    might have been resolved by the design.

22                    MR. ZIMMERLY: Correct.

23                    JUDGE GIBSON: Okay.

24                    Sorry.

25                    Thank you.

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1 JUDGE ARNOLD: Okay. SAMDA 1-B, Computer-  
2 Aided Instrumentation. The cost of this in 1991 was  
3 approximately 600,000. Correct?

4 MR. ZIMMERLY: Correct.

5 JUDGE ARNOLD: And today, depending on  
6 which index you use to bring the cost current that  
7 would be somewhere between 786,000 if you use  
8 Intervenor's number, to 1,350,000 if you use the NRC  
9 staff's number. Which kind of brackets the \$982,000  
10 that you're using as the lowest cost SAMDA in today's  
11 dollars. So there's very little implementation cost  
12 difference between the two. Is that correct?

13 MR. ZIMMERLY: That would seem correct.

14 JUDGE ARNOLD: The Technical Support  
15 Document estimates that this SAMDA would reduce the  
16 Core Damage Frequency by 3 percent. Correct?

17 MR. ZIMMERLY: Correct.

18 JUDGE ARNOLD: Is it credible that any  
19 amount of mitigation would make -- due to this SAMDA  
20 would make the cost significantly less than the  
21 \$750,000 you used as the minimum-cost SAMDA?

22 MR. ZIMMERLY: Could you repeat the  
23 question?

24 JUDGE ARNOLD: Okay. In correcting the  
25 cost of this you accounted for a 3 percent reduction

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1 in Core Damage Frequency. But you did not account for  
2 any potential mitigation of any other accidents. Due  
3 to the -- well, is there any way that a credible  
4 amount of mitigation could -- well, mitigation will  
5 always increase the cost. Correct? Or --

6 MR. ZIMMERLY: Mitigation should decrease  
7 the cost. But in this case implementing a SAMDA to  
8 get that mitigation would increase the cost.

9 JUDGE ARNOLD: So the assumption that --  
10 of neglecting the mitigative effect is reasonable for  
11 this SAMDA?

12 MR. ZIMMERLY: Yes.

13 JUDGE ARNOLD: SAMDA --

14 MR. FRANTZ: Dr. Arnold, I think the  
15 record may be getting confused here. There has been  
16 no discounting of mitigation costs. If you look at  
17 our various tables in the direct testimony they do  
18 account in every case for the mitigation costs at 100  
19 percent.

20 JUDGE ARNOLD: Right. I agree. And I  
21 certainly will not -- well --

22 Could you repeat that?

23 MR. FRANTZ: Yes. Just to give you a few  
24 examples. If you look at Table 10 on page 51 of the  
25 direct testimony.

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1 JUDGE GIBSON: Just a minute. We have  
2 Table 10 here.

3 MR. FRANTZ: Okay. The very first row,  
4 non-replacement power costs. Those are 100 percent in  
5 every case for every SAMDA. So we did not discount --  
6 the witnesses did not discount any of that. And  
7 that's also true of Table 8 and every other table. As  
8 you'll see as you go through, in every case we account  
9 fully for the -- every mitigation cost.

10 JUDGE ARNOLD: But I believe this is the  
11 averted mitigation costs. But in Table 11, in  
12 evaluating the cost of implementing the SAMDA there  
13 has been an adjustment due to the fact that you -- due  
14 to the fact that the SAMDAs do not avert all costs.

15 MR. FRANTZ: I think -- perhaps the  
16 witness is better to address this. But Table 11  
17 doesn't deal with SAMDA costs. It deals with SAMDA  
18 benefits.

19 JUDGE ARNOLD: Oops. Well, just cited the  
20 wrong table then.

21 JUDGE GIBSON: Was that in the rebuttal  
22 testimony?

23 MR. FRANTZ: That was in the direct  
24 testimony on page 64.

25 JUDGE ARNOLD: Thank you.

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1 MR. PIENIAZEK: Oh, were you talking about  
2 this?

3 JUDGE ARNOLD: Oh, Table 3 on page 26 of  
4 your direct testimony.

5 JUDGE GIBSON: It's right here.

6 JUDGE ARNOLD: Okay. The second column is  
7 the cost in 1991 dollars. The right-hand column is  
8 Risk-Adjusted SAMDA Implementation Costs.

9 MR. FRANTZ: Uh-huh.

10 JUDGE ARNOLD: And that is used to find  
11 that the lowest cost is the 750,000.

12 MR. FRANTZ: Uh-huh.

13 JUDGE ARNOLD: It's just that that  
14 adjustment is based upon the Core Damage Frequency and  
15 does not -- it's not clear to me that that adjustment  
16 would also account for any mitigative effect that  
17 didn't --

18 MR. FRANTZ: Yes.

19 JUDGE ARNOLD: -- affect the Core Damage  
20 Frequency.

21 MR. FRANTZ: And that was my point. We  
22 accounted for the mitigation costs in the other  
23 tables, in the Table 10, Table 8, for example.

24 MR. PIENIAZEK: It's entitled, Non-  
25 Replacement Power Costs. Is the -- what Mr. Frantz is

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1 referring to.

2 MR. ZIMMERLY: I think the question you're  
3 asking though, if I may -- the CDF -- the reduction in  
4 the CDF would lead to a greater reduction -- or would  
5 lead to greater benefits than just looking at the  
6 mitigative. So in this case if we were to include the  
7 mitigative it would only increase the fifth -- or the  
8 last column on this table, instead of just looking at  
9 the CDF. There would be less of a benefit if you just  
10 looked at the mitigative costs as opposed to  
11 eliminating the entire accident. There would be less  
12 benefit.

13 JUDGE ARNOLD: Okay.

14 MR. ZIMMERLY: And that would -- made the  
15 cost go up. So our analysis is conservative because  
16 we assume that the entire CDF is removed. There is no  
17 accident if you implement this SAMDA.

18 JUDGE ARNOLD: So for instance, SAMDA 1-C  
19 has a cost of \$299,000. If you account for 9 percent  
20 reduction in Core Damage Frequency the cost goes up to  
21 3 million. If you have additional mitigation that  
22 would just cause the \$3 million to go up higher?

23 MR. ZIMMERLY: No. If you were only to  
24 account for say, it mitigates 5 percent. Then instead  
25 of dividing by 9 you'd be dividing by 5, which would

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1 increase the number, because we're not going to  
2 account for the accident not happening and account for  
3 the fact that the accident costs less money.

4 JUDGE ARNOLD: Well --

5 MR. ZIMMERLY: We're assuming this -- the  
6 accident doesn't happen at all. So that is --

7 JUDGE ARNOLD: You're --

8 MR. ZIMMERLY: -- obviously the greatest  
9 saving.

10 JUDGE ARNOLD: You're saying that one  
11 specific or a group of accident sequences within the  
12 PRA event tree doesn't occur. What happens if there's  
13 mitigation on a different portion of the event tree  
14 that does not reduce the Core Damage Frequency of that  
15 sequence but does mitigate the accident?

16 MR. ZIMMERLY: We applied that using the  
17 CDF percent reduction. So if it affected two  
18 different sequences in the PRA, one by reducing the  
19 CDF and the other by eliminating some of the CDF --

20 JUDGE ARNOLD: Uh-huh.

21 MR. ZIMMERLY: -- then that's already  
22 accounted for in this reduction --

23 JUDGE ARNOLD: Uh-huh.

24 MR. ZIMMERLY: -- percent reduction CDF.

25 JUDGE ARNOLD: So let me see if I

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1 understand that. This Core Damage Frequency reduction  
2 on -- of 9 percent may actually be a Core Damage  
3 Frequency of 5 percent. But on another 4 percent you  
4 have mitigative effects and you've said, Well --

5 MR. ZIMMERLY: Well, it only affects the  
6 CDF. If there were additional -- I guess -- if we  
7 were to account for mitigation instead of the CDF we  
8 would add the CDF back into the value or in this case  
9 there would be zero percent reduction CDF, which  
10 obviously makes the value go up.

11 Well, if there were somewhere between zero  
12 and the CDF percent reduction in risk that value would  
13 make the value in the fifth column -- or the last  
14 column be higher than the value we have presented. So  
15 the reduction -- the mitigative actions would not be  
16 as much of a benefit as eliminating the accident.

17 JUDGE ARNOLD: I still get the impression  
18 that you're speaking of mitigation along the same  
19 accident sequence that leads to the Core Damage  
20 Frequency reduction. I mean, I would agree with what  
21 you've said under those circumstances. But say you  
22 implemented a SAMDA that eliminates Core Damage  
23 Frequencies having to do with a loss of coolant  
24 accident. So there's a Core Damage Frequency  
25 reduction there. It has no effect on a loss of off-

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1 site power. You get the same Core Damage Frequency  
2 for a loss of off-site power but it mitigates the  
3 effects. Have you accounted for the Core Damage  
4 Frequency reduction only in that case?

5 MR. ZIMMERLY: Yes.

6 JUDGE ARNOLD: Okay.

7 MR. FRANTZ: And again, Judge, just so the  
8 record's clear. There are two aspects of risk. One  
9 is prevention. One is mitigation. They only took  
10 into account risk reduction with respect to the  
11 preventive aspects. For the mitigative aspects they  
12 assumed 100 percent mitigation for every SAMDA.

13 MR. EYE: Your Honor, I'm going to object  
14 and move to strike the comments of counsel because  
15 he's actually testifying now. And I think that's  
16 improper under our proceedings.

17 JUDGE GIBSON: Thank you, Mr. Eye.

18 Mr. Frantz, we appreciate you being a good  
19 advocate for your client. But sometimes it is  
20 important to let your witnesses speak.

21 MR. FRANTZ: Yes, Your Honor.

22 JUDGE GIBSON: If we could move along,  
23 please?

24 JUDGE ARNOLD: We're going to skip ahead  
25 in my questioning here. I'll have to think on that

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1 for awhile. SAMDA Local Cost Adjustment. On page 21  
2 of your direct testimony you address the claim of  
3 expert witness Mr. Johnson, that the cost of  
4 implementing a SAMDA -- his claim was the cost of  
5 implementing a SAMDA should be adjusted downward by  
6 the regional cost adjustment of 91 percent. Is that  
7 correct? You addressed it there?

8 MR. ZIMMERLY: We addressed the question.  
9 That is correct.

10 JUDGE ARNOLD: Okay. The Technical  
11 Support Document does indicate that the costs of  
12 SAMDAs were estimated to be conservatively biased on  
13 the low side. But is there any indication that the  
14 conservatism in the estimated costs are sufficient to  
15 cover a regional cost adjustment of 91 percent?

16 MR. ZIMMERLY: Multiplying by 91 percent?  
17 That --

18 JUDGE ARNOLD: Does the Technical Support  
19 Document give you any quantification of how  
20 conservative?

21 MR. ZIMMERLY: Subject to re-review of the  
22 Technical Support Document I do not believe it gives  
23 any quantification to the conservatisms that it  
24 applies.

25 JUDGE ARNOLD: Okay. Now, we're talking

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1 about a 9 percent adjustment. The Technical Support  
2 Document at 8.1.1 states, "Improvements have been  
3 reviewed against conservative estimates of risk  
4 reduction based on the PRA and minimum order of  
5 magnitude costs." Can you describe what would be an  
6 order of magnitude cost in this instance? What does  
7 that mean?

8 MR. ZIMMERLY: Could you repeat the  
9 reference to where that was?

10 JUDGE ARNOLD: It was in 8.1.1, the  
11 background.

12 JUDGE GIBSON: If anybody has a more  
13 specific page, please let us know.

14 JUDGE ARNOLD: It's a very short section,  
15 I think. I believe it's page 31 of NRC 9-B.

16 JUDGE GIBSON: Exhibit 9-B page 31.

17 Mr. Welkie, can you put that up for us?

18 In the background section. Right?

19 JUDGE ARNOLD: That's what I said.

20 JUDGE GIBSON: Okay.

21 JUDGE ARNOLD: Let's see if I'm right.  
22 The last paragraph.

23 MR. ZIMMERLY: Could you repeat the  
24 question, please?

25 JUDGE ARNOLD: The question is in this

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1 context what does a minimum order of magnitude cost  
2 mean. How accurate were they trying to be?

3 MR. ZIMMERLY: I believe if we refer to  
4 Section A.1.3.2 it gives a little bit better  
5 definition of what it means.

6 JUDGE GIBSON: Could you tell us what page  
7 A.1.3.2 is on?

8 MR. ZIMMERLY: Page 32.

9 JUDGE GIBSON: Thirty-two? Thank you.

10 MR. ZIMMERLY: The first paragraph there  
11 and really all the way through at least the third  
12 paragraph.

13 JUDGE ARNOLD: In your opinion were these  
14 costs intended to be accurate to within 9 percent?

15 MR. ZIMMERLY: Yes. Conservatively.

16 JUDGE ARNOLD: In the Technical Support  
17 Action you -- Section A.5 -- let me see --

18 MR. ZIMMERLY: Can I go back to that last  
19 question and --

20 JUDGE ARNOLD: Okay.

21 MR. ZIMMERLY: Do I believe that these  
22 costs are accurate to the actual cost of  
23 implementation to 9 percent? The answer to that is  
24 no. The -- other than what's presented here, I don't  
25 really know what goes into these costs. And for what

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1 they were trying to produce I believe it's accurate  
2 within an order of magnitude of what they were trying  
3 to produce. And that's really the answer I answered.  
4 But I don't believe that was the answer that you  
5 gave -- the question you gave me.

6 JUDGE ARNOLD: Okay. In A.5 first  
7 paragraph, the last couple of lines, This section  
8 summarizes the cost basis for each of the  
9 modifications evaluated in Section A.4. This basis is  
10 generally the cost estimate less the credit for on-  
11 site averted costs. That last sentence there, the  
12 basis is the cost estimate less the credit for on-site  
13 averted costs. Could you explain what that means?

14 MR. ZIMMERLY: Could you give me a moment  
15 to read the --

16 JUDGE ARNOLD: Yes.

17 MR. ZIMMERLY: -- section? (Perusing  
18 document.) What that statement is saying is that this  
19 section, A.5, will be comparing the cost benefits to  
20 the costs of the SAMDA

21 JUDGE ARNOLD: It sounds to me as though  
22 the cost of implementing the SAMDA has been reduced in  
23 this comparison by the on-site averted costs.

24 MR. ZIMMERLY: I believe the third  
25 sentence to the end says, "This section summarizes the

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1 cost basis for each of the modifications evaluated in  
2 Section A.4." So the cost basis. This basis is  
3 generally the cost estimate less the credit for on-  
4 site averted costs. So this section is discussing the  
5 cost basis. Not the previous sections.

6 JUDGE ARNOLD: Right. But the -- it  
7 sounds to me as though the cost basis they used in  
8 their cost versus benefit analysis, the cost basis has  
9 been reduced by an amount that should be on the other  
10 side of the comparison. A fair thing. You subtracted  
11 the same amount from both sides. So these costs are  
12 not the actual implementation costs, they are the  
13 implementation costs less the on-site averted costs.

14 MR. ZIMMERLY: Okay.

15 JUDGE ARNOLD: Okay. In Answer 35 of your  
16 direct testimony concerning SAMDA calculation you  
17 state, "The replacement power costs calculated above  
18 were added to the other monetized impacts, e.g., on-  
19 site exposure cost and cleanup cost to provide the  
20 total monetized impacts for each unit." Now, these  
21 on-site exposure costs and clean up costs -- would  
22 these be the same things that were credit for on-site  
23 averted costs cited in the Technical Support Document?

24 MR. ZIMMERLY: Could you give me a moment  
25 to review that?

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1 JUDGE ARNOLD: Yes, I can.

2 MR. ZIMMERLY: I would have to look at  
3 what the definition of the on-site averted costs that  
4 GE is using here and compare that to what the  
5 definition that the new reg, the R-0184 gives us on  
6 site-averted costs. But it would appear that, yes, it  
7 is there.

8 JUDGE ARNOLD: Okay.

9 MR. ZIMMERLY: So --

10 JUDGE ARNOLD: Let's just assume for a  
11 moment that they both refer to the same cost. That  
12 means in your cost benefit analysis you've taken the  
13 cost of the SAMDA and reduced it by the on-site  
14 averted costs. Yet you've left them in this side. So  
15 that would, in fact, be a treatment that would favor  
16 finding a cost-effective SAMDA. Correct?

17 MR. ZIMMERLY: That's correct.

18 JUDGE ARNOLD: So you would consider that  
19 to be conservative?

20 MR. ZIMMERLY: That's correct.

21 JUDGE ARNOLD: So it's -- would not be an  
22 error that would, if corrected, cause you to find a  
23 new cost. Okay. Thank you.

24 MR. ZIMMERLY: That's correct.

25 JUDGE ARNOLD: I'm done for now.

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1 JUDGE GIBSON: Judge Charbeneau?

2 JUDGE CHARBENEAU: I have one other  
3 question I wanted to ask if I can find it here. I  
4 understand that you did not use the GDP implicit price  
5 deflator that the staff used originally. I'm just  
6 curious. If you think it's more accurate why didn't  
7 you use it?

8 MR. ZIMMERLY: It was more conservative to  
9 use the price inflator that the Intervenors had  
10 proposed.

11 JUDGE CHARBENEAU: Okay. Thank you.

12 JUDGE GIBSON: I think what we'll do at  
13 this point is take a 15-minute break. You all can  
14 compose any additional questions that you need.  
15 Highlight your proposed cross if there's something  
16 that Judge Arnold didn't cover. And we'll be -- come  
17 back in 15 minutes and get those questions answered.  
18 And then we'll go on to the next witness. We stand  
19 recessed for 15 minutes. Thank you.

20 (Whereupon, a short recess was taken.)

21 JUDGE GIBSON: Back on the record.

22 JUDGE ARNOLD: Okay. We have one question  
23 left. Do the witnesses agree that the primary cost  
24 justification to build and operate STP Units 3 and 4  
25 is tied to the rising cost of natural gas?

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1 MR. PIENIAZEK: I'll take that one. That  
2 is certainly one of the critical components in the  
3 decision. But it's just one of many decisions on  
4 whether or not STP 3 and 4 should be built. Natural  
5 gas price is one. Just taking the last few weeks into  
6 account and the near shortages we've had for power  
7 this summer, just a pure need comes into that, as  
8 well. There are a myriad of things that go into  
9 making that decision. And certainly, natural gas is  
10 one of them. But it's not the only thing.

11 JUDGE ARNOLD: Thank you.

12 JUDGE GIBSON: Okay. I believe that  
13 concludes our examination. And the two of you are  
14 excused. I do want to remind you that you remain  
15 sworn and you are subject to being recalled by the  
16 Board. But we thank you for your time and appreciate  
17 your testimony. Thank you.

18 While they are leaving I have a couple of  
19 housekeeping matters I'd like to bring up with you  
20 all.

21 First of all, Mr. Eye, have you confirmed  
22 with Mr. Mosenthal that he does have copies of all the  
23 exhibits?

24 MR. EYE: I spoke to him. And he is in  
25 the process of checking. And he believes he does.

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1 But he's --

2 JUDGE GIBSON: Okay.

3 MR. EYE: -- going to go back through and  
4 make certain that he does.

5 JUDGE GIBSON: Okay. Well, assuming for  
6 the sake of argument that he has them, I doubt  
7 seriously that he has what has been filed this week.  
8 And so I'm curious, especially since some of these  
9 things involve the replacement power costs contention,  
10 if it wouldn't be appropriate to make sure that he  
11 gets emailed a copy -- or transmitted in some way --  
12 an electronic copy of the exhibits that were filed  
13 yesterday and today.

14 MR. EYE: Yes. I believe those got sent  
15 but I will double check and make sure.

16 JUDGE GIBSON: Okay. Okay.

17 The other thing I wanted to bring up, Mr.  
18 Spender, yesterday you raised a question about the --  
19 updating the hearing file. And I just wanted to make  
20 sure that there wasn't any misunderstanding. When the  
21 record closed -- the record won't close tomorrow.

22 But when the hearing closes tomorrow your  
23 obligation to update the hearing file will be  
24 terminated as to the two contentions that are the  
25 subject of this proceeding. But obviously, if there

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1 are any other obligations that are not encompassed  
2 within these two proceedings, then obviously you'll  
3 need to continue to update the hearing file. I'm not  
4 telling you that you -- there is any such obligation,  
5 but I just wanted to be sure that the only thing  
6 that's going to change that is -- has to do with those  
7 two contentions.

8 MR. SPENCER: Your Honor, I'd like to  
9 speak to our obligations just to clarify what they  
10 are. The hearing file was triggered by the admission  
11 of contentions. The mandatory disclosures under 2336  
12 are also triggered. However, our obligations are not  
13 tied to any particular contention. They encompass the  
14 application, all correspondence between the Applicant  
15 and the NRC, documents supporting the staff's review.

16 I would say 99 percent or more of the  
17 documents that we -- that are in the hearing file have  
18 nothing to do with any of the admitted contentions.

19 JUDGE GIBSON: Uh-huh.

20 MR. SPENCER: So it may just be with  
21 the -- we go on doing what we've been doing. Is  
22 that --

23 JUDGE GIBSON: But let's say that you have  
24 a hearing terminated, you know, that the hearing  
25 closes --

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1 MR. SPENCER: Right.

2 JUDGE GIBSON: -- and then we have some  
3 pending contentions. But they may or may not be  
4 admitted or denied.

5 MR. SPENCER: Right.

6 JUDGE GIBSON: At that point, if there  
7 no -- if there's nothing live from the proceeding then  
8 I would assume our obligation's conclude.

9 MR. SPENCER: Yes. Well, I appreciate  
10 that it's not a completely unambiguous decision. A  
11 ruling on our part. I can only tell you that I  
12 realize there's these -- a pending contention that we  
13 had oral argument on yesterday. There is another one  
14 that's been filed with respect to Fukushima. But I  
15 guess it was just filed last week.

16 And so there -- and I assume, you know, potentially  
17 there's going to be other safety matters because  
18 the -- I guess the safety issues -- there are no  
19 safety issues. But I guess there could be once those  
20 safety documents come out.

21 And I'm not suggesting to you that you  
22 have an obligation to continue to update the file. I  
23 only want to make clear to you that the extent of our  
24 ability to provide you with dispensation from updating  
25 the hearing file is limited to these two contentions.

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1 If you have no more obligation other than that then  
2 obviously, you don't have to update the hearing file.

3 But, I mean, I can't provide you with an  
4 advisory opinion about what your obligations are. But  
5 I can tell you that in our -- in -- with -- you know,  
6 with respect to updating the hearing file, if you have  
7 no other obligations -- you determine that on your  
8 own -- if you have no other obligations other than as  
9 they relate to these two contentions, then you're  
10 completely safe in not updating the hearing file. If  
11 you conclude that you don't then you're going to have  
12 to continue to do it. Okay?

13 MR. SPENCER: Okay. Thanks, Your Honor.

14 JUDGE GIBSON: Okay.

15 I believe the Intervenor's witness is up  
16 next if there's nothing else.

17 MR. EYE: Thank you, Your Honor. We would  
18 call Clarence Johnson.

19 JUDGE GIBSON: Please raise your right  
20 hand.

21 Whereupon,

22 CLARENCE JOHNSON

23 having been first duly sworn, was called as a witness  
24 herein and was examined and testified as follows:

25 JUDGE GIBSON: Thank you. I believe that

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1 Judge Arnold has some questions.

2 MR. EYE: Before we begin, may I -- just  
3 a preliminary matter, Judge Arnold.

4 Mr. Johnson, was there an acronym that you  
5 used in your rebuttal that may need to be explained or  
6 corrected?

7 MR. JOHNSON: Yes. On page 16 of my  
8 rebuttal I just noticed that on occasion I used the  
9 acronym CDR instead of CDF. And that was a  
10 typographical error. I think it's pretty obvious from  
11 the context since I spell out Core Damage Frequency.  
12 But I just wanted to make that clear.

13 MR. EYE: Okay. In all other respects is  
14 your testimony -- are there any other changes you need  
15 to make?

16 MR. JOHNSON: No.

17 MR. EYE: All right. Thank you.

18 We tender the witness for cross-  
19 examination, Your Honor. Thank you.

20 JUDGE ARNOLD: Okay.

21 Are you qualified to answer questions  
22 concerning estimates of costs for power purchases?

23 MR. JOHNSON: Yes.

24 JUDGE ARNOLD: And what are those  
25 qualifications?

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1 MR. JOHNSON: Well, I've worked -- I  
2 worked for the Office of Public Utility Counsel for 25  
3 years. Among my duties were reviewing purchase power  
4 contracts and purchase power expenses of regulated  
5 utilities for reasonableness.

6 JUDGE ARNOLD: Uh-huh. Have you ever  
7 personally been responsible for purchasing power for  
8 cost estimating?

9 MR. JOHNSON: Other than for my household  
10 use, no.

11 JUDGE ARNOLD: Okay. Have you ever  
12 performed any sort of environmental impact study?

13 MR. JOHNSON: No.

14 JUDGE ARNOLD: Have you experience  
15 relative to environmental impact statements?

16 MR. JOHNSON: I have reviewed  
17 environmental impact statements as sort of a side part  
18 of my -- of work I've done in regulated utility area.  
19 However -- for instance, before the Public Utility  
20 Commission can issue a certificate of convenience and  
21 necessity for generation or for transmission there is  
22 an environmental review. So I am familiar and have  
23 made recommendations on those areas. But those are  
24 more limited than, you know, a complete environmental  
25 impact statement.

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1 JUDGE ARNOLD: Uh-huh. And are you in  
2 general knowledgeable of the National Environmental  
3 Policy Act, NEPA?

4 MR. JOHNSON: I am familiar with what it  
5 is. I -- it's been awhile since I've read it.

6 JUDGE ARNOLD: Yes. Would you agree with  
7 me that a NEPA evaluation -- its purpose is to inform  
8 the federal agency about the expected effects of a  
9 proposed action?

10 MR. JOHNSON: Yes.

11 JUDGE ARNOLD: Would you also agree that  
12 the goal of the NEPA analysis is to provide a  
13 reasonable and hopefully realistic evaluation of those  
14 expected effects?

15 MR. JOHNSON: Yes.

16 JUDGE ARNOLD: In a NEPA technical review,  
17 looking for expected results rather than bounding  
18 results would mean the analyst would not intentionally  
19 bias the analysis in any direction. Would you agree  
20 with that?

21 MR. JOHNSON: Generally, yes.

22 JUDGE ARNOLD: Have you ever used a  
23 dispatch model in your work?

24 MR. JOHNSON: I have not run a dispatch  
25 model myself. I have reviewed multitude of dispatch

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1 models and results. They are a pretty essential  
2 element of electric utility operations. And in my  
3 work evaluating fuel costs in a regulatory setting I  
4 have reviewed the assumptions and the results of many  
5 dispatch simulations.

6 JUDGE ARNOLD: Uh-huh. And have you  
7 performed any independent estimate of replacement  
8 power costs for STP Units 1, 2, 3 and 4?

9 MR. JOHNSON: I'm sure at some point in  
10 time I have made estimates of replacement power costs  
11 for STP Units 1 and 2, probably during the 1990s. You  
12 know, my testimony in this proceeding constitutes what  
13 work I have done in terms of reviewing the replacement  
14 power cost estimates produced by the Applicant and the  
15 staff.

16 JUDGE ARNOLD: Uh-huh. In performing a  
17 replacement power cost estimate what is the best basis  
18 for such an estimate? Would it be new Reg BR-0184,  
19 2009 ERCOT prices, 2008 ERCOT prices or something  
20 else?

21 MR. JOHNSON: Based on the information  
22 that's before us here I would recommend 2008 ERCOT  
23 market prices.

24 JUDGE ARNOLD: And why would that be?

25 MR. JOHNSON: Well, first of all, I think

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1 it's important to reflect the fact that power prices  
2 in Texas and within ERCOT are determined in a  
3 competitive market. Whereas, the approach originally  
4 taken in the GE estimates were based upon power pools  
5 composed of regulated utilities, were based on a cost-  
6 of-service basis for setting fuel costs. So I think  
7 there's clearly factually an important distinction to  
8 make with respect to the fact that an actual practice  
9 costs -- replacement power costs will be determined in  
10 a market in ERCOT.

11 With respect to choosing 2008, in my view  
12 the other potential data point or year, which is 2009,  
13 is -- will under-state forward looking natural gas  
14 prices. And that's because 2009 had the lowest  
15 average gas price since 2001. It also reflected  
16 recession conditions since it was the -- essentially  
17 the depths of the recession. So 2008 admittedly is a  
18 higher cost than many of the years in the 2000 decade.

19 However, we also have to consider that STP  
20 most likely will not be in commercial operation until  
21 2020 or later and that I think any -- you know, any  
22 respected or forecasts of natural gas prices on the  
23 long term would indicate that gas prices would be  
24 moving upward and closer to the 2008 number.

25 JUDGE ARNOLD: Uh-huh. When you speak of

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1 market effects is that essentially the same thing that  
2 I might consider to be the law of supply and demand?  
3 That --

4 MR. JOHNSON: Yes. And, you know, in some  
5 cases it's the principle of a supplier will charge  
6 what the market will bear.

7 JUDGE ARNOLD: Should the price estimate  
8 include market effects?

9 MR. JOHNSON: I'm not sure if you're  
10 meaning something other than just, you know, the  
11 impact of market determination of prices. I -- so I'm  
12 unclear on your question. I mean, in general, yes, it  
13 should include market effects.

14 JUDGE ARNOLD: Okay. In your opinion does  
15 the dispatch model include market effects?

16 MR. JOHNSON: The dispatch model assumes  
17 that prices will be reflective of marginal costs,  
18 which is the variable and fuel costs of operating each  
19 type of plant in the market. In my opinion that  
20 probably understates the actual market prices that  
21 will be produced. I can't say, though, whether the  
22 under-statement is significant or whether it's  
23 relatively small. But we do know that in general --

24 Let me step back a second and say that  
25 when -- the market prices are set on an hourly basis,

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1 even shorter intervals than an hour. And it's based  
2 on each generator bidding a price. And the generator,  
3 of course, is aware of its marginal costs. And my  
4 expectation would be that they would bid above their  
5 marginal costs because they're in a business to get a  
6 profit. So it may be a small margin but they probably  
7 will bid above their marginal costs. And this is with  
8 respect to at least generating units that are close to  
9 the margin.

10 And then secondly, they will be aware of  
11 changes that are occurring, whether they be units that  
12 are down and that are pushing prices up and they will  
13 begin to -- in those situations begin to bid prices  
14 that are higher and may be significantly higher than  
15 their marginal costs.

16 The -- you know, the winning price, the  
17 market-clearing price sets the price for all  
18 generating units that are supplying power in that time  
19 interval, whether it's an hour, 15 minutes, whatever  
20 number you want to use there. So --

21 In addition that, is -- I think there are  
22 potential market power effects. If -- a market power  
23 occurs when essentially a generator or set of  
24 generators has the ability to charge, you know,  
25 essentially what the market will bear and up to

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1 whatever the cap is that's established by the Public  
2 Utility Commission. And so that's another factor that  
3 leads to prices above marginal cost.

4 The dispatch model generally doesn't take  
5 those factors into account. And in general, if you  
6 look at, you know, prices in the market they generally  
7 tend to be somewhat higher than marginal cost. And in  
8 some markets when there's a scarcity condition they  
9 are significantly higher than marginal cost.

10 JUDGE ARNOLD: Should the cost estimate  
11 account for effects of price spikes?

12 MR. JOHNSON: Yes. And I think just to be  
13 clear, when I suggested the inclusion of price spikes  
14 the reason for that is not that there aren't already  
15 price spikes that are included in the average price,  
16 for example, in 2008, but it's the fact that price  
17 spikes are more frequent and more likely if there's a  
18 major event on the grid, such as, you know, 5,600  
19 megawatts being lost on the grid.

20 JUDGE ARNOLD: That would certainly be  
21 true for the first month. But we're talking a couple  
22 years of replacement power costs. Would you expect  
23 price spikes to be exacerbated for years or --

24 MR. JOHNSON: My expectation would be that  
25 over time the price spikes would begin to approach

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1 more normal levels as the market adjusts. I don't  
2 know what that time frame would be.

3 JUDGE ARNOLD: Uh-huh. The Applicant has  
4 performed sensitivity studies in which price spikes  
5 are first off accounted for within their average price  
6 over the ERCOT 2008 prices or ERCOT 2009 prices and  
7 have added in an additional 20 percent effect. Is  
8 that a sufficient accounting for price spikes?

9 MR. JOHNSON: For purposes of my testimony  
10 I accepted that. I do not have an alternate  
11 calculation. I think that was a -- you know, it was  
12 an effort to try to simulate that effect.

13 JUDGE ARNOLD: Okay. Should the  
14 replacement power cost estimate include in some way  
15 the effect of a potential grid outage?

16 MR. JOHNSON: Yes, I think that's a -- as  
17 I stated in my testimony, it's a fairly low  
18 probability but high consequence type event. And for  
19 purposes of my testimony, when I say -- when I refer  
20 to grid outage I refer not just to an extremely -- an  
21 extreme event like loss -- a blackout of the grid,  
22 which would be catastrophic, but also to the more --  
23 what I would call a controlled blackouts, which would  
24 be rolling blackouts that are used, in fact, to  
25 prevent the catastrophic level from being reached.

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1 JUDGE ARNOLD: Uh-huh. And should the  
2 price estimate include impact to consumers? Is the  
3 impact to consumers -- does that impact end up  
4 affecting the cost of the power again?

5 MR. JOHNSON: I think it is a consequence  
6 of the outage at the unit and the replacement cost at  
7 the unit. Certainly, the estimates that would have  
8 been provided in previous impact statements that  
9 looked at a regulated utility would have encompassed  
10 the consumer impacts because one utility served all  
11 consumers. And in this case because it's deregulated  
12 the STP has it's own replacement cost. But there is,  
13 in fact, just as in the regulated utility, there is an  
14 impact of the loss of the unit on all of the  
15 consumers. And in the case of STP there is an impact  
16 on all of the consumers in ERCOT. So I believe it  
17 should be included, even though I understand the  
18 argument that it's not a cost that is directly paid by  
19 the owners of STP.

20 JUDGE ARNOLD: Uh-huh. Within the SAMDA  
21 analysis there's basically, I believe, five categories  
22 of sub-costs. Two of them are on-site exposure and  
23 on-site clean up. Two of them are off-site, off-site  
24 exposure, off-site other economic costs. And then  
25 there's replacement power costs. If you were going to

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1 consider consumer impacts in a SAMDA analysis wouldn't  
2 it make more sense to categorize that as an off-site  
3 cost as opposed to a replacement power cost?

4 MR. JOHNSON: I'm not sure I would agree  
5 with that. I think that the consumer impact is a  
6 consequence of the STP's outage. It's a consequence  
7 of STP requiring more power to replace it's own power  
8 and thereby driving up the price for all the  
9 participants in the market. So in my mind if -- in my  
10 mind it does fit within the category of replacement  
11 costs -- replacement power costs.

12 JUDGE ARNOLD: Uh-huh. Okay. On page 10  
13 of your rebuttal testimony you state, "The average  
14 price per megawatt generated by NRG in 2010 was \$68.39  
15 based on dividing the power revenues by the power  
16 sold." Is that correct?

17 MR. JOHNSON: Yes.

18 JUDGE ARNOLD: Did you -- you were here  
19 for this morning's testimony?

20 MR. JOHNSON: Yes.

21 JUDGE ARNOLD: Would you still stand on  
22 that number, 68.39?

23 MR. JOHNSON: It may not be the exact  
24 number. I think -- if one were to take out costs  
25 that they don't -- do not consider as appropriate

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1 costs of, you know, purchasing power in the market.  
2 But I would point out in the SEC Form 10K all of those  
3 items are related to energy revenues or capacity  
4 revenues. So they are power revenues. They reflect  
5 what NRG actually paid for all of it's power-related  
6 activities in the Texas market on a rate basis  
7 compared to how much power they generated.

8 I think that the fact that that number is  
9 significantly higher than the balancing energy market,  
10 even accounting for the possibility that if one were  
11 to do an -- you know, a specific accounting you might  
12 take some revenues out -- even accounting for that it  
13 strikes me as unlikely that it does not show what I  
14 intended for it to show, which is that the bilateral  
15 market prices may be higher than the energy --  
16 balancing energy market prices that we are using to,  
17 you know, evaluate power costs within ERCOT.

18 JUDGE ARNOLD: Have you ever been directly  
19 involved in evaluation of a loss-of-grid event?

20 MR. JOHNSON: No.

21 JUDGE ARNOLD: Have you by some other  
22 means developed an understanding of grid dynamics and  
23 how a loss of grid may occur?

24 MR. JOHNSON: Yes. I am not an engineer,  
25 and I cannot necessarily get to the engineering level

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1 of discussing it. However, I have attended courses at  
2 ERCOT, training courses for the market participants on  
3 understanding, you know, some of the programs such as  
4 the Black Start Program, which is the basic program  
5 operated by ERCOT to prevent -- in the event that  
6 there were to be a complete loss of the grid, a  
7 complete blackout.

8 JUDGE ARNOLD: Okay. Previously you in  
9 your testimony here stated that the loss of grid is a  
10 low-probability high-consequence event. Correct?

11 MR. JOHNSON: Yes.

12 JUDGE ARNOLD: Now, the SAMA evaluation  
13 itself is a quantification of the effects of a very  
14 unlikely event, that being a severe accident.  
15 Correct?

16 MR. JOHNSON: Yes.

17 JUDGE ARNOLD: In fact, the Technical  
18 Support Document describes the Core Damage Frequency  
19 for the ABWR is 1.6 times ten to the minus 7 per  
20 reactor year. So that is quite unlikely. Correct?

21 MR. JOHNSON: Yes.

22 JUDGE ARNOLD: Is it reasonable and  
23 realistic that a SAMDA evaluation done to satisfy NEPA  
24 requirements of a reasonable evaluation -- should it  
25 need to consider an unlikely event, loss of grid, in

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1 conjunction with a very unlikely event, a severe  
2 accident? I mean, aren't you just piling up an awful  
3 lot of very small probabilities?

4 MR. JOHNSON: Yes. They are both -- both  
5 events are low probability but very high consequence.  
6 And I think the fact that the grid outage is a very  
7 high consequence event is a reasonable basis for  
8 considering it.

9 JUDGE ARNOLD: Okay. We're considering a  
10 narrowly focused contention challenging the cost of  
11 replacement power used in the SAMDA evaluation. Now,  
12 you claim that in order to determine the cost of  
13 replacement power we should consider a loss of grid.  
14 Correct?

15 MR. JOHNSON: Yes. And I would point out  
16 the loss of grid is a certainly replacement power cost  
17 issue since it means there is zero replacement power  
18 flowing.

19 JUDGE ARNOLD: I would think that during  
20 a period when there's no power flowing that cost of  
21 power would be either considered negligibly small or  
22 incalculably large. I mean, it just --

23 MR. JOHNSON: It would be --

24 JUDGE ARNOLD: It's difficult for me to  
25 see how that could be quantified and added into a cost

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1 of replacement power. Can you explain that?

2 MR. JOHNSON: It is hard to quantify. And  
3 all we can do is look at those studies which have been  
4 performed on grid outages. And, you know, the  
5 Applicant -- again, I have not challenged the  
6 Applicant's quantification in their response to my  
7 testimony and in their direct testimony because I  
8 believe it is very hard to calculate.

9 But I also think that accepting a zero  
10 when we know there is a actual possibility that it  
11 would occur that accepting that zero is not the  
12 reasonable course that I would take. I would tend  
13 toward including the costs to those events which could  
14 happen and particularly, if they're of a high-  
15 consequence nature.

16 JUDGE ARNOLD: Okay. On page 12 of your  
17 direct testimony you state, "The combination of high  
18 prices and rolling blackouts in the 2000-2001  
19 California energy crisis produced economic damage in  
20 the range of \$45 billion." Now, do you have personal  
21 experience in the California electrical system that  
22 would cover such things as production, distribution,  
23 use?

24 MR. JOHNSON: Certainly, I think anyone  
25 who is involved in the regulation of electric

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1 utilities and in the participation in developing  
2 competitive power markets has studied to some degree  
3 the California market. It was a -- an event that was  
4 very significant and which raised many questions about  
5 the operation of competitive market, market rules and  
6 so forth. So I certainly -- I did not participate in  
7 regulatory proceedings in California.

8 However, I know that in many of the  
9 proceedings I've participated in in Texas this -- the  
10 issue of the causes and the consequences of the  
11 California power market prices have -- were issues  
12 that were addressed and that, you know, I did -- I  
13 provided testimony on.

14 JUDGE ARNOLD: Uh-huh. In this contention  
15 we're concerned with an unexpected outage of four STP  
16 units and the resultant effects on the ERCOT grid.  
17 Would you agree with me that the situation in  
18 California was not caused by circumstances similar to  
19 the unexpected outage of four STP units?

20 MR. JOHNSON: Yes. And I should mention,  
21 I did not raise the quantification with respect to  
22 California's energy crisis to say that it was caused  
23 in the same way as an STP outage. I was simply trying  
24 to give an idea of the range of damages that were  
25 discussed and provided in reports with respect to that

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1 crisis.

2 JUDGE ARNOLD: Okay. In the ERCOT region  
3 the reserve capacity is sufficient to supply 100  
4 percent of the grid's needs even with the loss of STP  
5 Units 1, 2, 3 and 4. Correct?

6 MR. JOHNSON: Would you repeat the  
7 question? Or maybe clarify it? If you were talking  
8 about what you mean by the -- that it's -- go -- just  
9 repeat the question, please. I guess I didn't  
10 understand it.

11 JUDGE ARNOLD: Well, with a reserve margin  
12 of 13.75 percent and with STP Units 1, 2 and 3, 4  
13 representing about 4 -- or 6 percent of the grid  
14 capacity you can remove all four of those and still  
15 have sufficient capacity to provide all the power  
16 needed in ERCOT. Correct?

17 MR. JOHNSON: Yes. From an installed  
18 capacity standpoint, which is again, quite different  
19 from an operating capacity or operating reserve  
20 standpoint, yes, you do. Even though I would also  
21 point out that that would result in a severe  
22 degradation of the reserve margin, which means that  
23 there would be an increase in the probability of  
24 outages.

25 JUDGE ARNOLD: Now, in California in 2001

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1 did they have a similarly large reserve capacity?

2 MR. JOHNSON: California purchased power  
3 from other states. And I guess what I'm saying is  
4 they did not rely upon the installed capacity located  
5 within -- only within the State of California.  
6 Through longstanding practice they relied upon power  
7 throughout the western region. Whether there was  
8 sufficient installed capacity or not is really a --  
9 within that whole region is a -- you know, a question  
10 of dispute among many parties. Certainly, within the  
11 State of California the installed capacity reserve  
12 margin was quite low. But as I say, that really  
13 doesn't reflect the way that the California utilities  
14 and market had operated.

15 JUDGE ARNOLD: Let -- in -- let's see.  
16 Page 12 of your direct testimony concerning a grid  
17 outage, lines 11 through 13 you state, "These events  
18 may represent close to worst-case examples but they  
19 illustrate that grid outage costs can produce severe  
20 economic damages beyond replacement power costs."  
21 Now, you call them, Beyond replacement power costs,  
22 which to me would imply that it's, you know, not  
23 included in replacement power costs. Is that what you  
24 intended to say? Or --

25 MR. JOHNSON: No. I think maybe a better

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1 wording of that would be direct replacement power  
2 costs, as opposed to indirect or consequential damages  
3 flowing.

4 JUDGE ARNOLD: Okay. Now, just a minute  
5 ago you said that you cited the California event  
6 primarily to demonstrate the extent that the monetary  
7 cost of an outage could reach. Right?

8 MR. JOHNSON: Yes.

9 JUDGE ARNOLD: Might the extent of those  
10 costs be dependent upon the grid structure and  
11 characteristics in California that are dissimilar to  
12 grid structure and characteristics in Texas?

13 MR. JOHNSON: Well, I don't disagree that  
14 there can be differences in the grid structure and  
15 characteristics. I think, though, I would separate  
16 the question of whether the probabilities of events  
17 occurring in California are the same as in Texas.  
18 Maybe they're not because of the grid characteristics.

19 However, my point here had to do with what  
20 are the range of severe consequences of rolling  
21 blackouts and exercise of market power in the face of  
22 shortages -- you know, in the face of power shortages.  
23 You know, California did not have a blackout, in terms  
24 of the worst case where the grid goes down. They  
25 entered into a period of rolling blackouts in order to

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1 control the blackout situation and control the grid.  
2 So --

3 And in Texas we've had rolling blackouts  
4 here, too. And my point with respect to STP has been  
5 that it could be succeeded by a period of rolling  
6 blackouts, price spikes, all -- and potentially  
7 exercise of market power, all of those things which  
8 occurred in the California and produced extreme  
9 damage. Now, I will agree with you and grant you that  
10 the probability that the same events happen in Texas  
11 may be different because of differences in market  
12 rules and in the design of the grid.

13 JUDGE ARNOLD: Uh-huh. Okay. Changing  
14 topics here. Could you explain to me how the discount  
15 rate is used in the SAMDA evaluation?

16 MR. JOHNSON: Well, a discount rate is  
17 used to determine the present value of cash flows in  
18 the future today. In other words, it's often --  
19 present value is often referred to as determining a  
20 time value of money. And it's really reflecting the  
21 opportunity cost for funds, for expenditures in the  
22 future. That is to say, if you expend funds five  
23 years from now in the intervening time period your  
24 opportunity cost is your ability to make other  
25 investments in the intervening time frame. So as --

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1 in the SAMDA context I think the time value of money  
2 is reflected as it is in any cost benefit study, which  
3 is to reflect the opportunity cost over a period in  
4 the future.

5 JUDGE ARNOLD: All right. Well, I'm  
6 having difficulty with the concept of current value.  
7 I keep thinking, Well, if somebody promised -- told me  
8 that I was going to receive a million dollars ten  
9 years from now, well, that doesn't put any food on my  
10 table tonight.

11 MR. JOHNSON: Uh-huh.

12 JUDGE ARNOLD: So that's not worth even  
13 the cost of a meal to me. Is there any generally-  
14 accepted definition of what the current value means?

15 MR. JOHNSON: The first thing. In  
16 response to your, you know, comment about the promise  
17 of money in the future, I think a good analogy or --  
18 for present value is to look at winning the lottery.  
19 In Texas if you win the lottery you're given a choice.  
20 You can have X amount of money paid out over the next  
21 ten years on a yearly basis or you can have a smaller  
22 amount paid out today. And, of course, Texas lottery  
23 is just using a discount factor to equate those two  
24 flows.

25 The -- in terms of the concepts of present

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1 value, I think -- and discount rates -- you know,  
2 there are -- probably many books have been written on  
3 it and much debate over proper discount rates. But in  
4 my view in a project evaluation there's two ways to  
5 look at the discount rate.

6 One way is to say what is the discount  
7 rate to a private investor. In this case, you know,  
8 for instance, in a power plant if you're looking at it  
9 just from the standpoint of the private investor you  
10 might look at the interest rate available to that  
11 investor or perhaps to their weighted average cost of  
12 capital.

13 The other way of looking at present value  
14 is to look at a societal discount rate, which takes  
15 into account that in most cases the society discount  
16 rate is assumed to be significantly lower than the  
17 discount rate for individual investors. And I don't  
18 know if that answered your question or if that got too  
19 far astray.

20 JUDGE ARNOLD: Well, let me give you a  
21 for-instance. If I know that there is going to be a  
22 severe accident in the future and at that time I will  
23 need a specific amount of money to clean up for that  
24 accident I could say, Well, I need to put aside X  
25 amount of dollars now, invest it such that down the

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1 line when I need that amount of money, this money here  
2 will have become that amount of money. Now, that to  
3 me would be the present value of it. Is that a  
4 reasonable --

5 MR. JOHNSON: That's one approach, yes.

6 JUDGE ARNOLD: That's one. And there are  
7 other reasonable approaches?

8 MR. JOHNSON: Yes. As I said, I think if  
9 you're looking at it from a private investor's  
10 standpoint, like the owners of STP, you would -- in  
11 most cases I think studies would use their cost of  
12 capital, which would be, you know, what they expect to  
13 earn for investors and then what they have to pay in  
14 their interest rates. And it's assumed that that  
15 represents the return or their cost of money between  
16 now and whenever the event -- the project is  
17 completed, for example.

18 However, I could see -- you know, I -- you  
19 know, one could argue that you could take like a --  
20 create a sinking fund and determine what interest rate  
21 you think you would earn or would be -- would flow  
22 from -- you know, from that fund from putting money  
23 into the fund.

24 JUDGE ARNOLD: Uh-huh. Okay. Price index  
25 for escalating SAMDA costs from 1991. What are your

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1 qualifications for providing expert testimony on costs  
2 of a severe accident mitigation design alternative?  
3 And that would include escalating the costs.

4 MR. JOHNSON: I have -- as I've stated  
5 previously in my previous employment and consultant  
6 activities, I have participated in regulatory  
7 proceedings where the -- there are many studies, many  
8 projects that are evaluated that -- in which  
9 escalation rates must be used and applied.

10 I have not previously dealt with specific  
11 SAMDA issues, in terms of escalation, but certainly in  
12 any cost benefit study -- and I am familiar with doing  
13 cost benefit studies -- any cost benefit study --  
14 escalation and price inflation are important  
15 components.

16 JUDGE ARNOLD: Uh-huh. Have you ever done  
17 yourself any cost estimating for engineering projects  
18 or have you just reviewed them?

19 MR. JOHNSON: Reviewed them and provided  
20 testimony on the reasonableness of the estimates. But  
21 I have not been employed by an engineering firm nor  
22 have I been employed by a utility to do those tasks.

23 JUDGE ARNOLD: Okay. Would you agree that  
24 the rate of escalation of costs of various goods and  
25 services depends upon the specific goods and services

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1 in question?

2 MR. JOHNSON: Yes.

3 JUDGE ARNOLD: Okay. On page 15 of your  
4 direct testimony you state, "A weakness of the CPI is  
5 that it is based on fixed proportions of expenditure  
6 components and does not account for household's  
7 ability to change those proportions over time in  
8 response to price or other factors." Do you recall  
9 that?

10 MR. JOHNSON: Yes.

11 JUDGE ARNOLD: Okay. Now, the expenses  
12 involved in implementing any specific SAMDA are linked  
13 to specific required items in fixed proportion. So I  
14 do not understand how an index that reflects changing  
15 proportions provides a better means of adjusting the  
16 SAMDA cost. Could you explain that?

17 MR. JOHNSON: Well, first of all, I'm --  
18 it's not clear to me that SAMDA costs or the costs  
19 that comprise SAMDA are fixed in proportion over all  
20 time or should be fixed over all time. Presumably as  
21 new estimates are made and new processes are developed  
22 those proportions may change. If -- in other words,  
23 I am assuming that if you did a budget today it may  
24 not have the same composition as a budget in 1991. So  
25 I guess I am not willing to just accept that

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1 assumption that they are fixed proportions.

2 I think my comment here had to do with  
3 comparing this CPE to the Consumer Price Index. And  
4 the preference of the CPE over the Consumer Price  
5 Index is that if you want to know what the proper  
6 index is for consumer expenditures then you should  
7 reflect that consumer households change the  
8 composition of their expenses based on changes of  
9 prices in the economy.

10 JUDGE ARNOLD: Uh-huh. On page 15 of your  
11 direct testimony you state that, "Gross Domestic  
12 Product implicit price deflator is used to convert  
13 nominal cost to real cost." And I just want to make  
14 sure I understand what the nominal cost and the real  
15 cost are when you say that.

16 MR. JOHNSON: The tack that has been taken  
17 in this case by the Applicant is to establish cost as  
18 of 2009. So they've taken nominal costs that were  
19 proposed to be expended at an earlier time and applied  
20 an escalation rate to put them into 2009 dollars.

21 JUDGE ARNOLD: Uh-huh.

22 MR. JOHNSON: I should say the nominal  
23 rate means, you know, the cost in the year it was  
24 expended. And in that situation we're saying the year  
25 it would have been expended in that budget in 1991 or

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1 1992.

2 JUDGE ARNOLD: Uh-huh. Let's see. Now,  
3 you used the implicit price deflator for non-  
4 residential structures. NINA used the Bureau of Labor  
5 Statistics Consumer Price Index and this -- no wait.  
6 I'm sorry. Staff used the implicit price deflator for  
7 non-residential structures. NINA used the Consumer  
8 Price Index. And you are a proponent of the core  
9 personal consumption expenditures. All right.

10 Earlier today I questioned Applicant's  
11 expert about the specific components that are generic  
12 amongst various SAMDAs. And we decided that one would  
13 be an engineering design analysis. It would be pretty  
14 much universal on any SAMDA. There might be some  
15 procurement, including manufacturer and shipping.  
16 Installation, if it's hardware. Procedure  
17 modifications. QA and any licensing action required  
18 with the NRC. And he gave us his opinion as to which  
19 inflator best represented how those components would  
20 change in price.

21 And I want to go through that same list  
22 with you to see if you believe that the core personal  
23 consumption expenditures is the best inflator to use  
24 for each of them. The first one is engineering design  
25 and analysis.

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1 MR. JOHNSON: I think in each of these  
2 cases I would concur with the staff on the point that  
3 a consumer expenditure index is probably not the most  
4 reflective index. However, I would not have picked a  
5 non-residential fixed investment.

6 I would probably have picked, if -- from  
7 that standpoint of picking a non-consumer index, I  
8 probably would have picked the gross domestic private  
9 investment, which is composed of both non-residential  
10 structures and equipment and software because of the  
11 fact that the SAMDA should -- to a significant degree  
12 should include a reflection of computer communication  
13 technologies, as well as equipment. I assume that  
14 when you talked about procurement you're meaning  
15 fabricated equipment that is installed, which would  
16 fit in the definition of equipment and software.

17 So in terms of each of those items you  
18 mentioned in the previous cross-examination, I  
19 probably -- without further information, anyway, I  
20 would probably lean towards saying that the gross  
21 domestic private investment index is probably  
22 preferable. Otherwise, one could even go further up  
23 and have a more global index, such as the growth --  
24 such as the GDP implicit price deflator. But if one  
25 wants to focus on investment then I would probably

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1 suggest the gross domestic private investment, as I  
2 state in my rebuttal testimony.

3 JUDGE ARNOLD: Huh. I find that  
4 interesting. I look at engineering design and  
5 analysis to be very similar to work that an architect  
6 might do -- architect and drafters might do in -- for  
7 non-residential structures. So --

8 MR. JOHNSON: Yes. I --

9 JUDGE ARNOLD: Would that be better  
10 reflected in the GDP private investment?

11 MR. JOHNSON: Well, I mentioned the GDP  
12 private investment because we do not know -- I do not  
13 know specifically what the percentage composition or  
14 breakdown is of each SAMDA in each of these  
15 components. And not knowing that and without that  
16 kind of analysis, I would suggest a index -- an index  
17 which is a composite of the components that are likely  
18 for the SAMDAs as -- that's my -- that would be my  
19 inclination.

20 JUDGE ARNOLD: On page 6, lines 3 and 4 of  
21 your direct testimony you state that the accident at  
22 Fukushima likely will result in permanent shutdown of  
23 all six units. Then on page 14 and 15 of your direct  
24 testimony you state, "The accident at Fukushima in  
25 Japan provides a new reference point whereby accident

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1 damage to three units will likely result in the  
2 permanent shutdown of all six units." Do you still  
3 stand by that statement?

4 MR. JOHNSON: I don't know if they will  
5 result in permanent shutdown of all six units. But I  
6 think that's a possibility. I have to rely on news  
7 accounts of, you know, what's happening there. But  
8 that's -- my impression is that there will -- several  
9 of the units will be permanently shut down and the  
10 possibility of all six units. So -- but with that  
11 clarification, yes, I agree with the concept I'm  
12 stating there.

13 JUDGE ARNOLD: Okay. Would you  
14 characterize this as an opinion then?

15 MR. JOHNSON: Yes.

16 JUDGE ARNOLD: Yes. Now, you stated  
17 earlier that you're not an engineer. Do you have any  
18 formal education in engineering or physical sciences?

19 MR. JOHNSON: I'm not an engineer. I  
20 haven't taken any engineering courses. I, you know,  
21 have taken science courses in college. But --

22 JUDGE ARNOLD: Okay. Do you have any  
23 expertise in severe accident phenomena?

24 MR. JOHNSON: No.

25 JUDGE ARNOLD: Well, are you an expert

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1 qualified to submit testimony -- in testimony an  
2 expert opinion on severe accidents and their  
3 consequences?

4 MR. JOHNSON: I feel that I am qualified  
5 to take the information that's available and attempt  
6 to apply it in an economic study. And I think that's  
7 what many economists do, which is to take assumptions  
8 with respect to the consequences of an accident and  
9 apply it within an economic study. I am not  
10 testifying as to all of the physical actions that  
11 occur in the accident or in the sequence of the  
12 accident. But here I am more or less relying upon the  
13 fact that there are -- that there is a new reference  
14 point with respect to accidents, that it should be  
15 taken into account and considered in a policy  
16 situation.

17 JUDGE ARNOLD: The situation being  
18 considered in the STP contention concerns a four-unit  
19 plant where a severe accident occurs at one unit  
20 resulting in shutdown of the other three units for  
21 some period of time. The situation at Fukushima  
22 concerns a six-unit plant where severe accidents  
23 occurred simultaneously at three of six plants. The  
24 other three units had been shut down prior to the  
25 accident. What about the Fukushima plant and the

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1 accident makes this a reasonable benchmark for  
2 estimating the shutdown time for the three unaffected  
3 plants being considered in this contention?

4 MR. JOHNSON: Oh, I think that the fact  
5 that there is consideration of permanent shutdown of  
6 the other units that were shut down and were not  
7 directly affected indicates that the impact of an  
8 accident on a co-location unit may have a longer time  
9 period than the time period that occurred at TMI. In  
10 fact, the two-year period was based on a sample size  
11 of one, which was Three Mile Island. And as more  
12 examples arise they may be -- there may be critical  
13 differences and have to be taken into account. But as  
14 they arise they need to be factored into the  
15 consideration, too.

16 JUDGE ARNOLD: Uh-huh. Okay. Well, since  
17 you opened up the topic of world experience in severe  
18 accidents as providing a benchmark I would like you to  
19 consider another severe accident, that which occurred  
20 at Chernobyl in 1986. I assume you're familiar with  
21 that accident? At least.

22 MR. JOHNSON: Yes.

23 JUDGE ARNOLD: Okay. The situation at  
24 Chernobyl involved four co-located plants. A severe  
25 accident occurred at one of the four units. This

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1 resulted in controlled shutdown of the other three  
2 units within a day. It seems to me that the situation  
3 being considered by the SAMDA analysis of South Texas  
4 is much closer to Chernobyl, in terms of the number of  
5 units present, the number of units at which the  
6 accident occurs and the number of units shut down.  
7 Would you agree?

8 MR. JOHNSON: If you're looking at those  
9 parameters, yes.

10 JUDGE ARNOLD: Okay. Likewise, the units  
11 at Chernobyl were not identical. Units 1 and 2 were  
12 of an older design than units 3 and 4. This would  
13 also appear more similar to the situation at the STP  
14 contention, where Units 1 and 2 will be of an older  
15 design than Units 3 and 4. Would you also agree this  
16 is more similar?

17 MR. JOHNSON: I do not know of the  
18 vintages of the units at Chernobyl. So based on your  
19 characterization, that would appear -- you know,  
20 given -- that would appear to be the case.

21 JUDGE ARNOLD: Uh-huh.

22 MR. JOHNSON: But I am accepting your  
23 characterization on that.

24 JUDGE ARNOLD: I assure you Units 1 and 2  
25 were older than 3 and 4.

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1 MR. JOHNSON: Okay.

2 JUDGE ARNOLD: In addition, at Chernobyl  
3 the accident occurred at Unit 4, one of the newer  
4 plants. That also is similar to the situation we're  
5 considering at STP. We're considering an accident at  
6 Unit 3 or 4 and -- resulting in shutdown of all the  
7 plants. Would you agree that that is a closer  
8 similarity to STP than the Fukushima situation  
9 provides?

10 MR. JOHNSON: Again, given those -- if  
11 you're looking at those parameters it is. I really  
12 haven't done the analysis to say whether there are  
13 other parameters that would make Fukushima more  
14 comparable. But given the parameters of your  
15 question, I would agree with that.

16 JUDGE ARNOLD: Okay. At Chernobyl Unit 3,  
17 which was adjacent to Unit 4 where the accident  
18 occurred was restarted about a year-and-a-half after  
19 the accident at Unit 4. Units 1 and 2 have been  
20 restarted approximately six months after the accident.  
21 Why shouldn't this be considered a better benchmark  
22 than Fukushima for how long STP units would be shut  
23 down following an accident?

24 MR. JOHNSON: Well, I suppose that -- I  
25 would be reluctant to accept that the nuclear safety

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1 regulations with respect to radiation exposure and so  
2 forth in the Soviet Union -- former Soviet Union is  
3 comparable to the United States or is -- put another  
4 way, I would assume that Japan's requirements would be  
5 more comparable to the United States, in terms of the  
6 safety margin required to restart the units.

7 JUDGE ARNOLD: I'm done, sir.

8 JUDGE GIBSON: I know you've been sitting  
9 here quite a while. If you'll bear with me I've just  
10 a couple more questions. I don't know if Judge  
11 Charbeneau has any. Then I think we can take a 15-  
12 minute recess.

13 First of all, you used the acronym CPE.  
14 And I want to make sure for the court reporter's  
15 benefit she knows what CPE stands for.

16 MR. JOHNSON: I'm sorry. I should have  
17 said PCE.

18 JUDGE GIBSON: PCE. Okay.

19 MR. JOHNSON: Personal Consumer  
20 Expenditures.

21 JUDGE GIBSON: And this is the discount  
22 factor that you used?

23 MR. JOHNSON: Yes, in my direct testimony  
24 and in reviewing the Applicant's revision I suggested  
25 that the core PCE index should be used instead of the

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1 Consumer Price Index.

2 JUDGE GIBSON: Okay. Now, in your --  
3 in this -- I assume you've read the staff witness, Mr.  
4 Anderson's testimony and you've heard the testimony by  
5 the witnesses for NINA this morning about this  
6 price -- these discount factors and their conviction  
7 that the GDP implicit price deflator's the best  
8 measure. Do you agree that it is the best measure?

9 MR. JOHNSON: Well, first of all, when you  
10 shorten it to GDP implicit price deflator that's  
11 something I can agree with. In fact, I mentioned it  
12 as an alternative in my direct testimony. But I think  
13 what the --

14 JUDGE GIBSON: Please correct me --

15 MR. JOHNSON: Yes. Right.

16 JUDGE GIBSON: -- if I used the wrong  
17 term.

18 MR. JOHNSON: I think what they were --

19 JUDGE GIBSON: I'm sorry.

20 MR. JOHNSON: Yes. I think what they were  
21 referring to was the non-residential structures.  
22 Let's see. Where is the --

23 JUDGE GIBSON: The non-residential  
24 structures component of the GDP implicit price  
25 deflator. Is that what it was?

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1 MR. JOHNSON: Yes.

2 JUDGE ARNOLD: Okay.

3 MR. JOHNSON: I think that's right. And  
4 as I stated in -- under previous cross-examination  
5 here, I think there is merit to saying that the index  
6 should not be a consumer index and that it should be  
7 an investment index. And as I stated, I would propose  
8 to use -- make sure I've -- (Perusing document.)  
9 Okay. The -- it's stated there. The gross domestic  
10 private investment component of the GDP index is -- it  
11 would be my suggestion if we are deciding to use an  
12 index other than the consumer index, which I think has  
13 merit to do that. But I think that is preferable  
14 because it does include the equipment and software  
15 component of fixed investment.

16 JUDGE GIBSON: Now, I just want to make  
17 clear. Do your -- have you actually calculated the  
18 number with that index?

19 MR. JOHNSON: No, I have not. However,  
20 that index would reduce -- would produce a lower  
21 escalation factor than the PCE, Personal Consumer  
22 Expenditures index. So it would produce a result that  
23 is more conservative from the standpoint of my  
24 recommendation than the personal expenditures index.

25 JUDGE GIBSON: Okay. What's more

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1 conservative from your standpoint I don't fully  
2 appreciate. So let me --

3 MR. JOHNSON: No. I understand.

4 JUDGE GIBSON: -- just ask you this. How  
5 does it -- how would it affect replacement power  
6 costs? Would it make them higher or lower?

7 MR. JOHNSON: Well, this is --

8 JUDGE GIBSON: If you used this  
9 alternative measure.

10 MR. JOHNSON: You -- okay. These indexes  
11 are not being used on the replacement power costs.  
12 They're being used on the SAMDA --

13 JUDGE GIBSON: Right.

14 MR. JOHNSON: -- expenditure.

15 JUDGE GIBSON: Okay. I'm sorry. On the  
16 SAMDA expenditure. I'm sorry.

17 MR. JOHNSON: And my recollection is that  
18 my -- that the PCE was at 1.3 -- was a factor of  
19 1.31 --

20 JUDGE GIBSON: Uh-huh.

21 MR. JOHNSON: -- escalator and the gross  
22 domestic private investment escalator is 1.19 for the  
23 same time period.

24 JUDGE GIBSON: Okay. Thank you. Now, one  
25 other question. The -- you heard the testimony today

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1 from the NINA witnesses about the experience that they  
2 have had this summer with incredibly high temperatures  
3 in this heat wave and the demand it's put on the  
4 system, as well as the experience that they had during  
5 an arctic blast that came through here in February.

6 My question is, is that experience  
7 persuasive to you? Does it affect your testimony in  
8 any way? And if not, why not?

9 MR. JOHNSON: First of all, I think,  
10 starting with the February event, I perhaps have a  
11 somewhat different take on the implications of that  
12 event. It -- well, first of all, it was a very severe  
13 event that the independent market monitor stated that  
14 responsive reserve capacity fell as low as 445  
15 megawatts, compared to the requirement of 2,300  
16 megawatts, and characterized the operating reserves as  
17 "perilously low for a sustained period of time."

18 So, yes, it's true the system got through  
19 that and without more than rolling blackouts, which  
20 were a form of grid outage, but at least they were a  
21 controlled form.

22 But the independent market monitor's  
23 report and -- would indicate that there were  
24 significant red flags from that event, one of the red  
25 flags being that a number of the Black Start

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1 generators tripped and were unavailable. If the grid  
2 had gone black and there were no Black Start  
3 generators, there would have been, you know, a  
4 catastrophic result.

5 Second, I think if you look at the  
6 February event and compare it to what's happening this  
7 summer, there's a difference between the two events.  
8 We have low reserve margins now -- and I'm talking  
9 about installed reserve margins -- because demand is  
10 very high. However, we do not have a supply problem,  
11 in that the units have -- basically, the units are  
12 continuing to operate as they are supposed to.

13 In February we had a situation in which  
14 the event was caused by a supply problem. That is the  
15 generating units were unavailable; they didn't  
16 operate. I think the concern I would have is if you  
17 were to have similar supply problems at a time when  
18 it's in the summer at a very -- when reserve  
19 margins -- actual reserve margins are very low, you  
20 would be pressing your luck, in terms of the outcome  
21 for ERCOT.

22 JUDGE GIBSON: Thank you.

23 Judge Charbeneau? Judge Arnold?

24 (No response.)

25 JUDGE GIBSON: Okay. What we will do is

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1 we will recess for 15 minutes, give you all an  
2 opportunity to ask any questions that need to be done,  
3 either for rehabilitation or cross-examination. And  
4 we'll consider those, and then we'll take -- come back  
5 on 15 minutes from now and -- at 4:30 and we'll start  
6 up. Thank you.

7 (Whereupon, a short recess was taken.)

8 JUDGE GIBSON: We're back on the record.

9 I believe Judge Arnold has another  
10 question to ask.

11 JUDGE ARNOLD: And we want to see Exhibit  
12 NRC22 page 6-3.

13 The second row on this, what does that  
14 say? Investment equipment and software. Okay. The  
15 question here -- overall question is does the  
16 definition of equipment and software provided by the  
17 Bureau of Economic Analysis include components that  
18 are installed as part of a nuclear power plant.  
19 Referring to this exhibit, the second row on equipment  
20 and software, the second column provides a definition  
21 of equipment and software. And the last entry for  
22 that box explicitly -- does that last entry explicitly  
23 state that equipment and software does not include  
24 equipment that are integral parts of structures?

25 MR. JOHNSON: That's what the statement

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1 says.

2 JUDGE ARNOLD: Okay. And if you look at  
3 the same page at the first row do you agree that  
4 equipment that is an integral part of a structure is  
5 considered to be part of the structure part of the  
6 index, not the equipment and software part?

7 MR. JOHNSON: Can you take this over just  
8 a little? I just was trying to see what column or  
9 what --

10 All right. That's what I was trying to  
11 determine. This page includes certain types of  
12 equipment such as plumbing and heating systems and  
13 elevators that are considered an integral part of the  
14 structure.

15 JUDGE GIBSON: Excuse me just a second.  
16 You're going to have to talk into the microphone or --

17 MR. JOHNSON: Oh, I'm sorry.

18 JUDGE GIBSON: -- otherwise, we won't hear  
19 a word you're saying.

20 MR. JOHNSON: I'm just repeating what it  
21 states there. It says, "Includes certain types of  
22 equipment such as plumbing and heating systems and  
23 elevator that are considered an integral part of the  
24 structure."

25 Again, I would have to say that it's

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1       unclear to me exactly whether the SAMDA costs fall  
2       under, for instance, equipment installed, whether it  
3       falls under -- which of these categories it falls  
4       under. Obviously, it could fall under structures.  
5       And it depends on, you know, the definition of what  
6       integral part means.

7               JUDGE ARNOLD: Okay. My understanding of  
8       this table is that the second row is a description of  
9       the equipment and software component that -- or it's  
10      a description of what's -- I -- let me ask you this.  
11      Table 6.1 is labeled, Content of Private Fixed  
12      Investment. So this would be the entire index. And  
13      one component of it is what you think would be the  
14      proper price inflator? And that being the equipment  
15      and software portion?

16             MR. JOHNSON: Well, I proposed the private  
17      fixed investment total index, I think, in my -- let me  
18      look at my rebuttal testimony, make sure I'm --  
19      (Perusing document.) The gross domestic private  
20      investment, which is -- includes all of those  
21      components there.

22             JUDGE ARNOLD: Okay. Thank you.

23             JUDGE GIBSON: We appreciate your  
24      testimony. You're excused. Although I want to remind  
25      you that you remain sworn and you're subject to being

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1 recalled by the Board. We appreciate your testimony.

2 MR. JOHNSON: Thank you.

3 JUDGE GIBSON: Mr. Spencer?

4 MR. SPENCER: Your Honor, I would like to  
5 call Mr. Richard L. Emch, Jr., Mr. David M. Anderson  
6 and Mr. Jeremy P. Rishel to the stand.

7 JUDGE GIBSON: Would you please step  
8 forward. Please raise your right hands.  
9 Whereupon,

10 RICHARD EMCH, JR., DAVID ANDERSON and JEREMY RISHEL  
11 having been first duly sworn, were called as  
12 witnesses herein and were examined and testified as  
13 follows:

14 JUDGE GIBSON: Thank you.

15 I believe that Judge Charbeneau -- I mean,  
16 Judge Arnold has some questions.

17 JUDGE ARNOLD: Can we start out with your  
18 names so I know which one of you is which?

19 MR. ANDERSON: I'm David Anderson.

20 MR. EMCH: I'm Rich Emch.

21 MR. RISHEL: And I'm Jeremy Rishel.

22 JUDGE GIBSON: Let me just ask one  
23 question real quick. Are there any corrections at all  
24 to your testimony as it has been admitted in this  
25 proceeding, that you're aware of?

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1 MR. EMCH: No.

2 MR. ANDERSON: No.

3 MR. RISHEL: No.

4 JUDGE GIBSON: Thank you.

5 JUDGE ARNOLD: Which one of you is most  
6 experienced with SAMDA evaluations?

7 MR. EMCH: That would be me, sir.

8 JUDGE ARNOLD: Okay. And Mr. Emch?

9 MR. EMCH: Yes, sir.

10 JUDGE ARNOLD: Okay. And can you describe  
11 what experience you have with SAMDA evaluations?

12 MR. EMCH: Yes. I've been involved in the  
13 evaluation of SAMDA evaluations for numerous license  
14 renewal applications and for pretty much all of the  
15 COL applications over the last ten years or so. And  
16 I was one of the authors of an interim staff guidance  
17 document on the -- it was the approval of NEI 0501 on  
18 how to do a SAMDA analysis -- SAMA analysis.

19 JUDGE ARNOLD: Uh-huh. And I take it it's  
20 your professional opinion that the staff SAMDA  
21 analysis for Units 3 and 4 is reasonable?

22 MR. EMCH: Yes, sir.

23 JUDGE ARNOLD: Does the SAMDA analysis  
24 conclude that there is no alternative that is cost  
25 beneficial?

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1 MR. EMCH: It does, sir. Can I expand on  
2 that a little bit, sir?

3 JUDGE ARNOLD: Surely.

4 MR. EMCH: Okay. The design of the ABWR  
5 as is the case with most of the new designs, but the  
6 ABWR was designed with PRA in mind. I mean, it was  
7 used as a tool. And the -- any vulnerabilities that  
8 PRA analyses had shown in current operating designs  
9 and in -- and from all the research and experience  
10 that we have with severe accident phenomenology -- GE  
11 incorporated a lot of that information into the design  
12 of the ABWR.

13 And, in fact, the proof of the pudding is  
14 a Core Damage Frequency of something in the  
15 neighborhood of -- I believe you said 2 times 10 to  
16 the minus 7 per reactor year. We'll go with that.  
17 And so the point of this little discussion is to say  
18 they've already incorporated many things into the  
19 design to get rid of or to fix whatever risk  
20 vulnerabilities had been identified over the years.

21 So in a roundabout way or in a -- kind of  
22 essentially, you could think of the entire design of  
23 the ABWR was a exercise in SAMDA. Okay? They were  
24 looking for ways to improve the design and they  
25 were -- and so it -- in a sense it would be quite a

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1 surprise to us if there were any cost beneficial  
2 SAMDAs at this stage, simply put. So --

3 JUDGE ARNOLD: Uh-huh. Now, you were at  
4 the Atomic Energy Commission and then the NRC since  
5 1974?

6 MR. EMCH: Yes, sir.

7 JUDGE ARNOLD: Okay. So you were at the  
8 NRC at the time of the TMI accident. Correct?

9 MR. EMCH: Yes, sir.

10 JUDGE ARNOLD: To your knowledge, did that  
11 accident result in any grid outage?

12 MR. EMCH: Okay. I'll have to qualify  
13 this with I was pretty much a pure health physicist  
14 back then. But to my knowledge, I don't believe so,  
15 no.

16 JUDGE ARNOLD: Okay. During your career  
17 at the Atomic Energy Commission and the Nuclear  
18 Regulatory Commission, have you been aware of any  
19 unanticipated shutdowns of a nuclear power plant in  
20 the U.S.? Unexpected scram?

21 MR. EMCH: Oh, yes, sir. Yes.

22 JUDGE ARNOLD: A lot?

23 MR. EMCH: From time to time.

24 JUDGE ARNOLD: Do you know of any grid  
25 outages caused by a non-anticipated shutdown of a

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1 nuclear power plant?

2 MR. EMCH: I'm not aware of any, sir, no.

3 JUDGE ARNOLD: In your experience are --  
4 have you been aware of any situations where more than  
5 one nuclear power plant on the same grid shut down  
6 unanticipated?

7 MR. EMCH: I don't think so. I was -- to  
8 make sure I understand your question right. For  
9 instance, when Hurricane Andrew was approaching the  
10 Florida coast Turkey Point took a couple of -- you  
11 know, the -- both nuclear units out of hot -- you  
12 know, they took them out of operation and took them --  
13 I believe they went down to hot standby to maximize  
14 the number of systems they would have available to  
15 them.

16 JUDGE ARNOLD: Okay.

17 MR. EMCH: I'm not sure that that's what  
18 you were driving at, though.

19 JUDGE ARNOLD: Right. There have been  
20 cases where more than one plant on a grid shut down.

21 MR. EMCH: Right. And actually, most of  
22 the plants that are anywhere in a zone where  
23 hurricanes are an issue, they have a hurricane  
24 procedure, so to speak, where they make sure  
25 everything's tied down, everything's in place and they

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1 take the plant down to -- if they think they're going  
2 to be within the cone of influence they'll take the  
3 plant down, like I said, to like, hot shut down or  
4 something like that.

5 JUDGE ARNOLD: Uh-huh. In your  
6 professional opinion is it likely that a severe  
7 accident at STP Unit 3 or 4 would result in a grid  
8 outage?

9 MR. EMCH: I don't believe I'm really the  
10 one to answer that. I'm not quite sure who is. But  
11 I -- well, for a moment. We'll go back to the -- I  
12 don't know if this is along the lines of what you're  
13 thinking of. But Hurricane Andrew. Okay.

14 Actually, the plant survived quite well.  
15 The Turkey Point units. But, of course, the  
16 surrounding area did not. Okay. Simply speaking,  
17 everything around for many, many miles was flattened  
18 and Turkey Point, because of -- for whatever,  
19 corporate pride or whatever, wanted to start up right  
20 away. And the answer was, You know what, we really  
21 don't need you to start up because there's nobody to  
22 give power to.

23 JUDGE ARNOLD: Okay. Yes.

24 MR. EMCH: I don't know if that's where  
25 you were headed or not, sir. But --

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1 JUDGE ARNOLD: Should the potential for a  
2 grid outage be considered within the SAMDA evaluation?

3 MR. EMCH: I don't believe so, sir, no.  
4 Earlier there was discussions about the probability of  
5 a severe accident and then the probability on top of  
6 that of some sort of a grid or a loss of something.  
7 And to some extent that's why I was talking about the  
8 Turkey Point example. If you've got a phenomena,  
9 let's say a weather phenomena that's widespread  
10 enough, you know, it's a bigger deal than just the  
11 nuclear power plants shutting down. So --

12 JUDGE ARNOLD: Uh-huh. Well, I would --

13 MR. EMCH: We believe that the combination  
14 would be remote and speculative in the vernacular of  
15 NEPA.

16 JUDGE ARNOLD: Yes. Thank you very much.

17 Mr. Anderson, you advocate using the Gross  
18 Domestic Product implicit price deflator for non-  
19 residential structures for escalating the cost of a  
20 SAMDA to current dollars. Correct?

21 MR. ANDERSON: That's correct.

22 JUDGE ARNOLD: Are there any other indexes  
23 that would provide a reasonable estimate of SAMDA cost  
24 escalation?

25 MR. ANDERSON: Not in my view, Your Honor.

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1 There are other approaches. And it depends on the  
2 level of reasonableness that you're willing to accept,  
3 I suppose. For example, the guidance in NUREG/BR-0184  
4 I believe calls for use of the Consumer Price Index.  
5 That would not be the index that an economist would  
6 choose.

7 JUDGE ARNOLD: On page 6 of his rebuttal  
8 testimony --

9 MR. EMCH: Excuse me --

10 JUDGE ARNOLD: -- Mister --

11 MR. EMCH: You -- earlier you asked -- as  
12 sort of a follow-up earlier you asked some of the  
13 other witnesses about the various items that might be  
14 part of, components of a SAMDA. And I just wanted to  
15 mention one thing. You might have -- I was going to  
16 mention training as an additional component. Now,  
17 sometimes people think of training as being another  
18 form of procedures. And so you might have had that in  
19 mind. But I was just going to mention that I would  
20 say I would add to the list training of the --

21 JUDGE ARNOLD: Okay. Thank you. And I  
22 will be getting around to that. So --

23 MR. EMCH: Oh, okay.

24 JUDGE ARNOLD: On page 6 of his rebuttal  
25 testimony Mr. Johnson advocates use of the equipment

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1 and software -- or, I guess, the GDP private non-  
2 residential fixed investment, which includes equipment  
3 and software as the proper tool for escalating SAMDA  
4 costs. Are you familiar with that?

5 MR. ANDERSON: Yes, sir.

6 JUDGE ARNOLD: Okay. What exactly would  
7 this equipment and software component reflect?  
8 What --

9 MR. ANDERSON: Well, you had that exhibit  
10 up during Mr. Johnson's testimony. If you -- I forget  
11 the exhibit number. But we could put it back up and  
12 look exactly at what it's -- what's included.

13 JUDGE ARNOLD: Okay.

14 MR. ANDERSON: But I might point out maybe  
15 a better exhibit to show you would be Exhibit -- NRC  
16 Exhibit 18. we can address this, also if you'd like.  
17 Whichever one.

18 JUDGE ARNOLD: Okay.

19 MR. ANDERSON: That's what you were  
20 referring to was the second row of this table. And  
21 that's distinct from the non-residential structures.  
22 These are the specific definitions of the two indexes  
23 that have been mentioned.

24 JUDGE GIBSON: Just one second, please.

25 MR. ANDERSON: Sure.

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1 JUDGE GIBSON: Mr. Welkie, which exhibit  
2 is this and what page?

3 MR. WELKIE: 22, 6.3.

4 JUDGE GIBSON: Whose 22?

5 MR. WELKIE: The NRC.

6 JUDGE GIBSON: The NRC staff Exhibit 22 at  
7 page --

8 MR. WELKIE: 6.3.

9 JUDGE GIBSON: -- 6.3

10 MR. ANDERSON: Correct.

11 JUDGE GIBSON: This is what your testimony  
12 is referring to right now?

13 MR. ANDERSON: Yes.

14 JUDGE GIBSON: Thank you.

15 JUDGE ARNOLD: All right. Okay. The  
16 various lines in this table reflect different indexes?  
17 Or --

18 MR. ANDERSON: Yes. And the other exhibit  
19 that I propose to show will show you the hierarchy of  
20 these indices so that you can get a better context for  
21 what we're discussing.

22 JUDGE ARNOLD: Okay. Is the better --

23 MR. ANDERSON: Well --

24 JUDGE ARNOLD: Is the other --

25 MR. ANDERSON: -- it puts this table into

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1 perspective.

2 JUDGE ARNOLD: Well, which is the better  
3 thing to be displaying here?

4 MR. ANDERSON: They're both of equal  
5 weight.

6 JUDGE ARNOLD: Okay. So the --

7 MR. ANDERSON: These are the definitions.  
8 And the other exhibit will show you where these  
9 indices fall in the hierarchy of Gross Domestic  
10 Product --

11 JUDGE ARNOLD: So --

12 MR. ANDERSON: -- deflators.

13 JUDGE ARNOLD: So the second line is the  
14 equipment and software?

15 MR. ANDERSON: Correct.

16 JUDGE ARNOLD: Could we zoom in on the  
17 right-hand column, second line?

18 MR. ANDERSON: Yes.

19 JUDGE ARNOLD: Oh, boy. You have no idea  
20 how un-enlightening this is to me.

21 MR. ANDERSON: Well, but the key that you  
22 should focus on is the last sentence there, "Excludes  
23 equipment that are integral parts of structures."  
24 Which that equipment is reflected in the index that we  
25 used.

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1 JUDGE ARNOLD: And you say that most SAMDA  
2 would consist of such --

3 MR. ANDERSON: Well --

4 JUDGE ARNOLD: -- structures?

5 MR. ANDERSON: -- let me back up. Perhaps  
6 a way to put this in context for you would be to  
7 explain how the staff views this entire consideration  
8 of SAMDAs. SAMDAs are really alternatives to plant  
9 design that affect the entire project, the entire  
10 construction project of the reactors. And so it's the  
11 staff's position that the prospect of looking at  
12 SAMDAs should be viewed in the context of the overall  
13 project construction.

14 And when you do that I feel that the non-  
15 residential structures index is the most appropriate  
16 index to apply to the entire plant construction, of  
17 which the SAMDAs are minor variations and design.

18 JUDGE ARNOLD: Uh-huh.

19 JUDGE GIBSON: Before we leave this  
20 exhibit I'd like to focus on that last sentence you  
21 were just mentioning, that that's the one we ought to  
22 focus on, that says, "Excludes certain types of  
23 equipment that are integral parts of structures that  
24 are not included in the value of structures."

25 MR. ANDERSON: Right.

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1 JUDGE GIBSON: Now, it -- there's  
2 something that's a little bit ambiguous about that  
3 sentence because it says, Excludes certain types.  
4 Which means there's certain types that are included  
5 and some that are excluded. Can you give us some  
6 perspective from the staff's point of view about what  
7 certain types of equipment -- because this was not  
8 designed for nuclear power plants, this was designed  
9 for all kinds of facilities.

10 MR. ANDERSON: That's correct.

11 JUDGE GIBSON: What about a nuclear power  
12 plant would be excluded or included under that last  
13 line from the staff's perspective?

14 MR. ANDERSON: From the staff's  
15 perspective the best answer I can give you is the  
16 preceding cell of the table, just above where we're  
17 looking now, where it does describe --

18 JUDGE GIBSON: Okay.

19 MR. ANDERSON: -- the types of equipment.

20 JUDGE GIBSON: That would be the first  
21 cell.

22 MR. ANDERSON: Yes.

23 JUDGE GIBSON: Okay.

24 Could we go to the first cell, Mr. Welkie,  
25 so we -- I make sure we know what we're talking about

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1 here.

2 Okay. That? Is that what you wanted to  
3 look at.

4 MR. ANDERSON: That's correct.

5 JUDGE GIBSON: Okay.

6 MR. SPENCER: Your Honor, it's -- for the  
7 purpose of transcript, it may not be clear what the  
8 first cell is tied to --

9 JUDGE GIBSON: Thank you.

10 MR. SPENCER: -- which --

11 JUDGE GIBSON: Excellent point, Mr.  
12 Spencer. Thank you.

13 Okay.

14 MR. ANDERSON: This --

15 JUDGE GIBSON: Hold on a minute.

16 MR. ANDERSON: All right.

17 JUDGE GIBSON: This is the first cell of  
18 Table 6.1 on the exhibit that we've been discussing,  
19 which is on page 6.3. Is this Exhibit --

20 MR. ANDERSON: Twenty-two.

21 JUDGE GIBSON: -- 22? Okay. Now -- and  
22 we're talking about the first cell under comments on  
23 that exhibit. And Mr. Welkie is highlighting that for  
24 the witness so that you can explain to us what the  
25 significance is of this first cell for explaining what

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1 the last sentence of the second cell means. Please  
2 proceed.

3 MR. ANDERSON: "Includes certain types of  
4 equipment." I'm reading now the third sentence.  
5 "Includes certain types of equipment such as plumbing  
6 and heating systems and elevators that are considered  
7 integral parts of the structure." I would agree that  
8 it's not --

9 JUDGE GIBSON: Yes, I know.

10 MR. ANDERSON: -- explicit --

11 JUDGE GIBSON: Because it contains --

12 MR. ANDERSON: -- to a nuclear plant. But  
13 what you have to keep in mind with these indices that  
14 are developed by the Bureau of Economic Analysis is  
15 that they're intending to throw a wide net --

16 JUDGE GIBSON: Sure.

17 MR. ANDERSON: -- and they can never get  
18 a specific -- you know, you have to get as specific as  
19 you can.

20 JUDGE GIBSON: Fair enough. It's just  
21 what is difficult for me to understand the value of  
22 the statement is that in the first cell it says,  
23 Includes certain types of equipment. In the second  
24 cell it says, Excludes certain types of equipment. So  
25 essentially, what we've got is there's the things that

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1 are in and the things that are out but we don't really  
2 know what they are, other than plumbing, heating  
3 systems and elevators. That's the extent of it.  
4 Right? With some qualification --

5 MR. ANDERSON: That's the extent of --

6 JUDGE GIBSON: -- that's there --

7 MR. ANDERSON: -- what's been documented,  
8 yes. That's correct.

9 JUDGE GIBSON: Okay. So -- because the  
10 qualification, That are considered an integral part of  
11 the structure refers back to certain types of  
12 equipment. So --

13 MR. ANDERSON: Right. But --

14 JUDGE GIBSON: -- it seems to me that in  
15 some ways we're chasing our tail trying to use this  
16 table. Now, I realize there's another one that you  
17 want to refer to. And we're going to get to that.

18 MR. ANDERSON: Well, I --

19 JUDGE GIBSON: But I want you to see if  
20 you can provide some context for us because certain  
21 types of equipment seems to me to be basically  
22 useless, because it includes them in one and excludes  
23 them in the other and doesn't say what it is.

24 MR. ANDERSON: I agree. Except that the  
25 point of focus on this table should be what is

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1 included, in terms of the big ticket items, in my  
2 view. So we're talking about construction of a non-  
3 residential structure.

4 JUDGE GIBSON: Okay.

5 MR. ANDERSON: The major construction  
6 activities. Which are identified there, such as --  
7 you know, they talk about additions, alterations,  
8 structural replacements, pipelines, railroad tracks,  
9 power lines and plants, dams and levies. Large  
10 industrial construction. That's the reason that the  
11 staff chose this particular index. It was the most  
12 specific available index --

13 JUDGE GIBSON: Okay.

14 MR. ANDERSON: -- in my view.

15 JUDGE GIBSON: Okay. Well, that's fine.  
16 I just -- so you think it basically -- the includes  
17 refers to big stuff and the excludes is little  
18 stuff --

19 MR. ANDERSON: Yes.

20 JUDGE GIBSON: -- essentially. Is that  
21 right?

22 MR. ANDERSON: Correct.

23 JUDGE GIBSON: Okay. Now, you indicated  
24 there was another --

25 MR. ANDERSON: Exhibit?

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1 JUDGE GIBSON: -- exhibit that you believe  
2 is perhaps more useful for purposes of understanding  
3 this.

4 MR. ANDERSON: It provides additional  
5 context.

6 JUDGE GIBSON: Okay. Provides additional  
7 context.

8 MR. ANDERSON: Yes. That would be Exhibit  
9 18 --

10 JUDGE GIBSON: Okay.

11 MR. ANDERSON: -- I believe.

12 JUDGE ARNOLD: Before we get into that,  
13 just one more question on this table. The fact that  
14 certain types of equipment -- or wait -- "includes  
15 certain types of equipment," in the first line, where  
16 it's investment and structures by private business.  
17 Does that refer to the same stuff that is excluded in  
18 the second line?

19 MR. ANDERSON: That's my belief.

20 JUDGE ARNOLD: Thank you.

21 JUDGE GIBSON: Okay. What was the other  
22 exhibit?

23 MR. ANDERSON: Eighteen.

24 JUDGE GIBSON: Okay. And this would be  
25 NRC Staff Exhibit 18.

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1 MR. ANDERSON: If you could focus on  
2 the --

3 JUDGE GIBSON: Correct?

4 MR. ANDERSON: -- far left. Yes. NRC  
5 Exhibit --

6 JUDGE GIBSON: Okay.

7 MR. ANDERSON: -- 18.

8 JUDGE GIBSON: And is this just a one-page  
9 document?

10 MR. ANDERSON: Yes.

11 JUDGE GIBSON: Or is this -- so this is  
12 only one page? So we're -- your testimony is now  
13 referring to Staff Exhibit 18.

14 MR. ANDERSON: Correct.

15 JUDGE GIBSON: Is that correct? Okay.  
16 Thank you.

17 MR. ANDERSON: This is an attempt to show  
18 the hierarchy of these various indices. So if you  
19 focus at line 7 you start by looking at gross private  
20 domestic investment. Okay? And then you nest down  
21 into more specific indices as you nest inward. Okay?  
22 So the structures index that I'm -- or the non-  
23 residential structures index that I'm referring to  
24 nests down through line 8 and 9 to line 10. That's  
25 how you arrive at the index. And the other, the

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1 equipment and software, is -- well, let me back up.

2 Line 10 is the index that was represented  
3 by the first line of the table in Exhibit 22. The  
4 second line of the table in Exhibit 22 is represented  
5 by line 11 in this table. So you could see these are  
6 the most detailed levels that you can get to in terms  
7 of a domestic product implicit price deflator to use  
8 for inflation scaling.

9 JUDGE GIBSON: Now, do I understand  
10 correctly that the staff uses this document for --  
11 well, let me rephrase.

12 What is the -- what does the staff use  
13 this document for?

14 MR. ANDERSON: Okay. This document is  
15 used to develop the inflation scaling factor that is  
16 used in the SAMDA analysis.

17 JUDGE GIBSON: Okay. And so you basically  
18 use different inflation factors, depending on what the  
19 item is. Is that right? Where it falls on this  
20 table?

21 MR. ANDERSON: Well, in the context of  
22 this analysis the item is the overall project --  
23 construction project.

24 JUDGE GIBSON: Okay. And would that fit  
25 under structures?

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1 MR. ANDERSON: In my view.

2 JUDGE GIBSON: Okay. And so anything  
3 that's a structure, in your estimation, would fit  
4 under that. Okay?

5 MR. ANDERSON: A non-residential --

6 JUDGE GIBSON: At a nuclear --

7 MR. ANDERSON: -- structure.

8 JUDGE GIBSON: -- power plant?

9 MR. ANDERSON: Correct.

10 JUDGE GIBSON: Okay. And that would be  
11 the appropriate inflation adjustment or deflator,  
12 whatever we're going to call it, discount rate or  
13 something that we're going to use. Is that right?

14 MR. ANDERSON: Well, it's definitely --  
15 it's called a deflator.

16 JUDGE GIBSON: A deflator. Okay.

17 MR. ANDERSON: That's the proper term.  
18 It -- you use it by taking a -- the target year over  
19 the source year. And that ratio gives you the factor.

20 JUDGE GIBSON: Okay.

21 MR. ANDERSON: That's explained in the  
22 testimony.

23 JUDGE GIBSON: Okay. And that's the  
24 reason that you chose the --

25 MR. ANDERSON: The 2.2 --

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1 JUDGE GIBSON: -- non-residential  
2 structures component of the GDP implicit price  
3 deflator because it matches up to this table?

4 MR. ANDERSON: Correct.

5 JUDGE GIBSON: Okay. Thank you.

6 JUDGE ARNOLD: We're going to look at  
7 equipment and software. We've already discussed the  
8 equipment portion of that. But looking at software,  
9 in my experience I've run across two different types  
10 of software. And that is commercial off-the-shelf  
11 software that you can just go out and -- to a vendor  
12 and buy. And then there's software that's more  
13 developed for a specific purpose. I'm trying to  
14 figure out the -- in the equipment and software is  
15 that software better reflective of off-the-shelf or  
16 individual developed software?

17 MR. ANDERSON: It's my believe that it's  
18 more reflective of the individually developed  
19 software, special purpose software. However, the  
20 SAMDA that addresses that should be viewed in the  
21 context of the overall plant construction. So, you  
22 know, when you evaluate all these questions they need  
23 to be in the context of the real thing that you're  
24 valuing is a plant with some alternatives added to it.  
25 Rather than simply looking at each SAMDA like it's on

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1 a menu, for example.

2 JUDGE ARNOLD: Uh-huh. Okay. As I did  
3 with NINA and the Intervenors, I want to go through  
4 the components of a SAMDA and get you opinion as to  
5 what index is best -- the best reflector of the cost  
6 of that. I previously divided the SAMDA into various  
7 cost components. The first one was engineering design  
8 and analysis. What index would provide the best  
9 reflection of that cost?

10 MR. ANDERSON: Well, again, Your Honor,  
11 the way I viewed this question was in the context of  
12 the entire plant. So all of my analysis is based on  
13 how would you scale the cost of an entire plant with  
14 varying alternatives in the -- in SAMDA space. So I  
15 don't have a way to ascribe a specific index for each  
16 SAMDA measure. If you -- is there another way you  
17 could pose -- or -- the question to perhaps help my  
18 understanding or -- do you understand --

19 JUDGE ARNOLD: Well, let me put it like  
20 this. The costs of the SAMDA, the estimate -- I don't  
21 think they sat down and estimated the entire plant  
22 cost without the SAMDA and then sat down and evaluated  
23 the cost of the entire plant with the SAMDA. I think  
24 they had the plant cost done and they said, To add  
25 this SAMDA it would cost an additional so many

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1 dollars. So I think that would kind of argue against  
2 your position. And your position doesn't exactly help  
3 me develop an understanding of what index is the  
4 best -- is the most appropriate. But I don't think I  
5 can reword this in a way that fits into your picture  
6 of how to do it.

7 Is there anyone else to -- Mr. Emch, do  
8 you have any opinions here?

9 MR. EMCH: With some trepidation. I once  
10 heard a nuclear power plant described as a really  
11 large collection of piping and cables -- once you get  
12 outside of the reactor -- a really large collection of  
13 piping and cables. I -- you know, that kind of sounds  
14 to me like the index that Dave is talking about.

15 And as you've pointed out, Judge Arnold,  
16 there are several -- I mean, depending on which SAMDA  
17 you pick out of the list they're going to varying  
18 degrees use -- be composed of these components that  
19 you've already talked to us about. But -- and we felt  
20 that the one that Dave picked was the appropriate one.

21 The only other thing I wanted to add is  
22 after just the little bit of looking that we did at  
23 the indexes that were proposed by the various parties  
24 here, my impression -- and I think that the numbers  
25 would bear this out -- I don't really think it makes

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1 that much difference, sir. Okay. I don't think -- I  
2 think that the -- you know, within reason whatever  
3 index you choose, I believe it's not going to change  
4 the conclusions of the analysis that there are no  
5 cost-beneficial SAMDAs.

6 JUDGE ARNOLD: Uh-huh.

7 Mr. Anderson, I think this is for you. In  
8 providing an estimate of replacement power costs  
9 what's the best, most realistic basis for that, the  
10 NUREG/BR-0184, ERCOT prices in 2008, ERCOT prices in  
11 2009 or something else?

12 MR. ANDERSON: Well, as I stated I believe  
13 in my testimony, it's important to reflect realistic  
14 conditions. To the effect that -- or to the degree  
15 that the NRC guidance was written for regulated  
16 markets it may not fully apply, though parts of it do.  
17 And it's the only guidance available. Recognizing  
18 that it's not unwarranted to look at the effects of  
19 prices that are actually observed in the market that  
20 you're considering. Which was done in both the  
21 Applicant and staff analysis, again, with the bottom  
22 line conclusion that that does not change.

23 JUDGE ARNOLD: Uh-huh. And to what extent  
24 should market effects be included in the cost  
25 estimate?

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1 MR. ANDERSON: In reflection on the  
2 testimony -- well, let me back up a little bit. In  
3 the staff's testimony on this point the intent was to  
4 lay out our analysis in sort of a side-by-side  
5 comparison with how the Applicant proceeded through  
6 their analysis. Saying that, we adopted all of the --  
7 or similar approaches on the treatment of market  
8 effects.

9 And it's my belief that the impact on  
10 price, the multiplier, if you will, to price that you  
11 can determine by removing the STP units from service  
12 is sufficient to account for market effects and that  
13 the additional step of multiplying that price by all  
14 the megawatt hours ever produced in a year is simply  
15 a re-characterization of the same impact.

16 JUDGE ARNOLD: Uh-huh. And price spikes.  
17 Should there be some special accounting for those?

18 MR. ANDERSON: I don't think it's  
19 unreasonable to account for price spikes. Since -- in  
20 the case of ERCOT, anyway, there is documentation to  
21 suggest some level of price spike behavior that can be  
22 observed in the market. It's not unrealistic to  
23 perform some sort of add-on, if you will, for price  
24 spikes.

25 JUDGE ARNOLD: Uh-huh. Should the SAMDA

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1 analysis consider the effect of a grid outage?

2 MR. ANDERSON: In my opinion, no. Again,  
3 the information that we have about grid outages is  
4 speculative. We've already heard testimony about how  
5 remote the options for complete grid outage are. And  
6 staff did not look at or address the potential for  
7 rolling blackouts or any of that type of potential  
8 impact. Again, we're not aware of a reliable  
9 probability to assign to such events.

10 The probability that was adopted by -- or  
11 assumed by the Applicant and reflected in the staff  
12 analysis, as well is a 10 percent probability. I  
13 think we all agree that that is probably a high --  
14 very high number, making it conservative. And the  
15 multiplication of probabilities results in although a  
16 potentially significant event, when risk weighted it's  
17 very small. Very small contribution to the impact.

18 JUDGE ARNOLD: And should the effect of  
19 consumer impacts be included in SAMDA as part of the  
20 replacement power costs?

21 MR. ANDERSON: Not in my opinion. It's  
22 already reflected in the multipliers that you get to  
23 the average balancing prices.

24 JUDGE ARNOLD: Of the two discount rates  
25 used by Applicant, 7 percent and 3 percent, which of

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1 these is most appropriate and why?

2 MR. ANDERSON: Well, in the view of the  
3 staff the 7 percent discount rate is favored for a  
4 couple of reasons. The Office of Management and  
5 Budget suggests that for federal projects, federal  
6 actions, the 7 percent rate should be used. It  
7 reflects the opportunity costs of capital faced by the  
8 commercial sector. And as such, the Applicant being  
9 a commercial entity, it would reflect a more realistic  
10 opportunity cost of capital for them. There is also  
11 a suggestion in the guidance to use 3 percent to  
12 reflect the societal discount rate, which the staff  
13 and the Applicant have done, as well in our analysis.  
14 That's fairly standard practice in benefit cost  
15 analysis.

16 JUDGE ARNOLD: And depending -- do you get  
17 any different SAMDA conclusion if you use a 3 percent  
18 versus 7?

19 MR. ANDERSON: No, sir.

20 JUDGE ARNOLD: No. Okay. That's it for  
21 me.

22 JUDGE GIBSON: What we'll do is we'll  
23 recess at this point. It may not take you all 15  
24 minutes to know whether you have any -- to put your  
25 questions together. But we will go in our break-out

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1 room and Mr. Esser will come back out in a few  
2 minutes.

3 MR. EMCH: Judge Gibson?

4 JUDGE GIBSON: Yes?

5 MR. EMCH: There was some discussion about  
6 one particular topic earlier today that we, as the  
7 staff, feel that we'd like to be heard on. The  
8 discussion about --

9 MR. EYE: Your Honor, I'm going to object.  
10 There's not a pending question. So I don't think this  
11 is a proper statement.

12 JUDGE GIBSON: Well, you -- your counsel  
13 is welcome to propose some rehabilitation if that's  
14 necessary, if that's -- okay?

15 So we'll -- we will recess to our break-  
16 out room. And when you all are ready for us we'll  
17 come back on and finish this up today. Thank you.

18 (Whereupon, a short recess was taken.)

19 JUDGE GIBSON: A couple of minor  
20 housekeeping matters before we get back into our  
21 examination. First of all, the security guards, as I  
22 understand it, have left. And the doors are locked.  
23 So when you leave this place please be sure and put  
24 your badge by the security desk where you got it this  
25 morning. And realize that once you're out of there

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1       you're not getting back in here.   Okay?

2               The second thing is, Counsel, I would  
3       definitely like for you all to give some thought to  
4       how long you're going to need for closing argument  
5       tomorrow. You can tell us -- you don't need -- don't  
6       know this now. But we would like to know it by -- in  
7       the morning. You all can think about that.   Okay?

8               And final thing is when we conclude here  
9       I believe this is going to conclude our examination  
10      with respect to Contention CL-2. And so if the  
11      witnesses or other personnel that are involved in that  
12      need to go back I don't think there's going to be any  
13      reason why we're going to need to call them tomorrow.  
14      So you can make your own decisions. But at least I  
15      wanted to let you know that.

16              Yes?

17              MR. SPENCER:   Your Honor, I have one  
18      questions on closing argument tomorrow.

19              JUDGE GIBSON:   Yes?

20              MR. SPENCER:   Would the Board mind if the  
21      staff used two different attorneys for part of the  
22      closing argument? Or does the Board just want one  
23      attorney for closing argument?

24              JUDGE GIBSON:   No, that will be just fine.  
25      That will be fine.

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1 MR. SPENCER: Thank you.

2 JUDGE GIBSON: Sure.

3 Okay. I'd like -- I don't know which one  
4 of you is -- I guess, Mr. Anderson, are you the expert  
5 in non-residential structures index?

6 MR. ANDERSON: Yes, sir.

7 JUDGE GIBSON: Okay. Does the non-  
8 residential structures index cover the following  
9 aspects of SAMDA cost components? First, design. Yes  
10 or no?

11 MR. ANDERSON: Yes.

12 JUDGE GIBSON: Procurement?

13 MR. ANDERSON: Yes.

14 JUDGE GIBSON: Installation?

15 MR. ANDERSON: Yes.

16 JUDGE GIBSON: Procedures?

17 MR. ANDERSON: Yes.

18 JUDGE GIBSON: Quality assurance?

19 MR. ANDERSON: Yes.

20 JUDGE GIBSON: License activities for  
21 seeking regulatory approval?

22 MR. ANDERSON: I believe so.

23 JUDGE GIBSON: Okay.

24 Now, who is the expert in Core Damage  
25 Frequency?

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1 MR. RISHEL: I think that question can be  
2 referred to me.

3 JUDGE GIBSON: Okay. Can you explain how  
4 Core Damage Frequency is used in the staff's refined  
5 analysis?

6 MR. RISHEL: Yes. In the staff's direct  
7 testimony it would probably be appropriate to bring up  
8 Table 13 to begin with, if possible.

9 JUDGE GIBSON: Okay. Just a minute.  
10 Table 13 to what? Your testimony?

11 MR. RISHEL: Yes, the staff's direct  
12 testimony.

13 JUDGE GIBSON: Okay. What page is that  
14 on?

15 MR. RISHEL: That's on page 62.

16 JUDGE GIBSON: And that would be of the  
17 direct or rebuttal?

18 MR. RISHEL: Correct.

19 JUDGE GIBSON: No. I mean, actually, it's  
20 one or the other.

21 MR. RISHEL: Oh, this is the direct.  
22 Sorry.

23 JUDGE GIBSON: Okay.

24 MR. RISHEL: I thought you said correct.

25 JUDGE GIBSON: No. That's okay. That's

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1       okay.

2                   MR. RISHEL:  Sorry about that.

3                   JUDGE GIBSON:  I understand.  It's late in  
4       the day.  But we are going to finish today on this  
5       contention.  So what page?

6                   MR. RISHEL:  This is page 62.

7                   JUDGE GIBSON:  Okay.  Before you say  
8       anything let's let Mr. Welkie get it up there for you.

9                   Now, it's on the side.  Maybe we can turn  
10      that around?  Okay.  Anyway we can make that a little  
11      bigger, Mr. Welkie?  Thank you.

12                   Okay.

13                   MR. RISHEL:  I bring this table to the --  
14      to your attention primarily to show one thing.  
15      Basically, in our SAMDA analysis up to this very point  
16      we're doing what's called a screening analysis.

17                   And what I mean by that is as we did the  
18      averted cost calculations we assumed that the SAMDA --  
19      the lowest cost SAMDA in this case, which pre-  
20      inflation adjusted, mitigated 100 percent of the Core  
21      Damage Frequency.  So in essence what we're doing is  
22      we're taking the lowest cost SAMDA and saying it can  
23      reduce 100 percent of the accident sequences for the  
24      reactor.

25                   We do that as a screening analysis,

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1 because if the screening analysis didn't show a SAMDA  
2 as being cost beneficial clearly, if you introduce the  
3 actual Core Damage Frequency reduction it would just  
4 spread the gap. And this case here is --

5 JUDGE GIBSON: Hold on a minute. It would  
6 just spread the gap?

7 MR. RISHEL: Well --

8 JUDGE GIBSON: You'll have to explain what  
9 you mean by that.

10 MR. RISHEL: What I mean by that is if you  
11 start introducing the actual Core Damage Frequency for  
12 the SAMDA -- each SAMDA's ability to reduce Core  
13 Damage Frequency it cannot avert as much cost as you  
14 asserted in the screening analysis. The screening  
15 analysis assumes 100 percent meaning that it can get  
16 rid of all accident classes when, in fact, it can only  
17 address a certain accident class or maybe little bits  
18 of several, but not 100 percent. So it would just be  
19 a fraction of that. And so the benefit of that SAMDA  
20 is not nearly as good as it is stated here in this  
21 particular table. And so the benefit is actually  
22 significantly less. And so what I mean by the gap is  
23 in terms of the SAMDA's cost and its benefit they  
24 spread apart.

25 MR. EMCH: Another way of looking at it,

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1 if you look on this table the -- let's say very top  
2 one there -- 14.6. If that number gets to one well,  
3 you've reached the edge of cost beneficial, cost-  
4 effective. Okay? And so when we refer -- we've got  
5 into the habit of referring to it as the gap, because  
6 as we evaluate each factor we say, Does it spread the  
7 gap or bring them closer together -- or bring it --  
8 make it closer to being cost-effective. So that's why  
9 I'm sorry that we used that terminology, the gaps.

10 JUDGE GIBSON: No need to apologize. It  
11 was just -- I didn't didn't know what you were talking  
12 about.

13 MR. EMCH: So --

14 JUDGE GIBSON: And it's probably a good  
15 idea if I do. So --

16 MR. RISHEL: And I apologize. So in Table  
17 13 I just wanted to bring that to the counsels'  
18 attention that what we're assuming here is that the  
19 lowest cost SAMDA is reducing 100 percent of the Core  
20 Damage Frequency.

21 JUDGE GIBSON: Okay.

22 MR. RISHEL: When we -- if you could  
23 actually go back to -- one step back -- one table  
24 back, Table 12 in the staff's testimony.

25 JUDGE GIBSON: Page 60.

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1 MR. RISHEL: Yes, that's on page 60.

2 JUDGE GIBSON: Just the table?

3 MR. RISHEL: Yes, just the table.

4 JUDGE GIBSON: Okay.

5 See if we can highlight that and make it  
6 a little bigger.

7 MR. RISHEL: Yes.

8 JUDGE GIBSON: Let me just make sure. The  
9 witness is testifying about Table 12 on page --

10 MR. RISHEL: Sixty.

11 JUDGE GIBSON: -- 60 of your --

12 MR. RISHEL: Direct.

13 JUDGE GIBSON: -- direct testimony.

14 MR. RISHEL: Correct.

15 JUDGE GIBSON: Okay. Thank you.

16 MR. RISHEL: This table's essentially the  
17 last row of Table 13, which we had just looked at.  
18 But

19 the reason I'm looking at this particular table, Table  
20 12 is the attributes of a SAMDA analysis. So we look  
21 at public exposure and property damage. They're off-  
22 site costs.

23 And then we also look at the averted on-  
24 site costs. The contention focuses on replacement  
25 power costs. In this particular table here we have

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1 assumed all the Intervenor's preference in terms of  
2 power spikes, consumer costs and outages. And that's  
3 how we get to the replacement power costs being there,  
4 for example, on the 7 percent discount rate of  
5 \$170,592.

6 The assumption here is that that's the  
7 maximum benefit. So any SAMDA that you would  
8 implement is actually going to only account for a  
9 certain fraction of that dollar amount, not that  
10 dollar amount that you see there. And so what the  
11 staff did as the next step -- the next logical step in  
12 the SAMDA analysis you would actually introduce the  
13 Core Damage Frequency for each SAMDA.

14 And so if you look here, for example, the  
15 off-site costs are very, very small. Public exposure  
16 and property damage only amount to \$86. So if you  
17 have a mitigative SAMDA, for example, it's only going  
18 to address those numbers very minimally. The  
19 replacement power one, in order to have replacement  
20 power costs you in effect need to take the reactor  
21 offline. You need to damage it. You need to have  
22 Core Damage Frequency. By mitigating and accident you  
23 still allow the accident to occur, you still have core  
24 damage, you still need replacement power.

25 And so to address SAMDAs or to refine the

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1 analysis the next step would be to say, Well, does  
2 this SAMDA actually reduce Core Damage Frequency. And  
3 so the staff does that in its direct testimony and  
4 also, the rebuttal testimony. So I would refer as the  
5 final table to look at, in this case we could look at  
6 Table 14 in the staff's direct testimony.

7 JUDGE GIBSON: Okay.

8 And let's find that, Mr. Welkie, please.

9 MR. RISHEL: That would be on -- let's see  
10 here -- page 69 of the staff's direct testimony.

11 JUDGE GIBSON: Okay. The witness will be  
12 testifying from -- or off of page 69 of the direct  
13 testimony, Table 14.

14 MR. RISHEL: In Table 14, column 2 --  
15 well, column 1 has the SAMDAs that actually reduce  
16 Core Damage Frequency. Out of the 21 SAMDAs that GE  
17 proposed in the Technical Support Document only a  
18 handful actually reduce Core Damage Frequency. The  
19 majority of them are mitigative. So they will allow  
20 the core to damage. And so you'll have replacement  
21 power costs for all those.

22 It's these few here that actually reduce  
23 the probability of a Core Damage Frequency. And so  
24 these are the ones that are going to mitigate the  
25 power costs. And so these are the ones that you would

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1 focus on the next step beyond the screening analysis  
2 where you assumed 100 percent reduction with every  
3 SAMDA.

4 In this case here you can see that of  
5 these seven or eight SAMDAs that are listed in this  
6 table, they don't reduce 100 percent. In some cases  
7 they reduce a fractional amount, 2 percent, anywhere  
8 up to 52 percent. So this is as good as it gets for  
9 these SAMDAs. This is getting more at the actual  
10 reduction potential. And so this --

11 JUDGE GIBSON: Hold on.

12 MR. RISHEL: Sure.

13 JUDGE GIBSON: You say it's as good as it  
14 gets, you know. What do you mean as good as it gets  
15 for these SAMDAs?

16 MR. RISHEL: In terms of being able to  
17 reduce Core Damage Frequency they're not 100 percent.  
18 They're not capable of reducing Core Damage Frequency  
19 at 100 percent.

20 JUDGE GIBSON: Okay.

21 MR. RISHEL: It's some value less than  
22 that. This is --

23 JUDGE GIBSON: So there is core damage?

24 MR. RISHEL: Well, this is the reduction  
25 probability --

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1 JUDGE GIBSON: Right.

2 MR. RISHEL: -- of that 100 percent value.

3 And --

4 JUDGE GIBSON: Okay.

5 MR. RISHEL: So some of these -- for  
6 example, 2-C, the very first one there, does some  
7 reduction of Core Damage Frequency. And when you  
8 introduce the reduction of Core Damage Frequency, the  
9 actual value, you can see that in the column -- let's  
10 see. It's --

11 JUDGE GIBSON: Yes. Actually, we need you  
12 to slide it a little bit to the left. Thank you.

13 MR. RISHEL: The -- column 4, the actual  
14 averted on-site costs. That column there is showing  
15 you it's more reflective of the benefit of the SAMDAs.  
16 So it's not what was in Table 13 using the screening  
17 analysis. This here is reflective of the actual  
18 benefit of the handful of SAMDAs that do reduce Core  
19 Damage Frequency. Minding the fact that we have  
20 included all the assumptions that the Intervenor  
21 proposed. So the numbers tend to be fairly high, in  
22 terms of the base numbers, than what we would normally  
23 consider in a traditional SAMDA analysis.

24 So when you introduce the actual Core  
25 Damage Frequency you find that, for example, the best

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1 performing SAMDA here, the cost of the SAMDA -- it's  
2 SAMDA --

3 If you could slide to the left, please, so  
4 I can just see -- it's that bottom one there, 9-B.  
5 And then back over again. Sorry.

6 JUDGE GIBSON: It's the next-to-the-  
7 bottom, wasn't it -- isn't it?

8 MR. RISHEL: Yes. It's the next -- yes.

9 JUDGE GIBSON: Okay.

10 MR. RISHEL: The best one there, the cost  
11 of the SAMDA is 29.3 times more than its expected  
12 benefit. When you start introducing the actual Core  
13 Damage Frequency reduction potential of these SAMDAs.  
14 This is a -- including all areas that the Intervenor  
15 took with regard to replacement power. So all those  
16 considerations are in there. And the only thing we  
17 have done in this one step is introduce actual Core  
18 Damage Frequency reduction.

19 And so it shows here that even though you  
20 might -- even with consideration of these additional  
21 effects for replacement power costs when you take away  
22 one level of conservatism, meaning you step out of the  
23 screening analysis mode and start applying the actual  
24 Core Damage Frequency, those considerations don't  
25 afford you a cost-beneficial SAMDA, even with their

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1 consideration. So when we --

2 JUDGE GIBSON: When you say even with  
3 their consideration you mean even using their numbers?

4 MR. RISHEL: Exactly.

5 JUDGE GIBSON: Is that what you mean?

6 MR. RISHEL: Yes. Sorry.

7 So even when you include those costs  
8 calculations in, in the replacement power ledger, that  
9 part that we've been talking about today, the price  
10 spikes, the consumer impacts, the grid outage,  
11 regardless of their merit, if you just include them  
12 based on the assumption of how they were calculated,  
13 you get to a situation here, when you start  
14 introducing actual Core Damage Frequency, where these  
15 considerations don't actually change the conclusion,  
16 meaning that there is no cost-beneficial SAMDA with --  
17 when you do consider them.

18 So you could look at it two ways. You  
19 could argue each one independently and say, Is this  
20 the right way, the correct way to account for that  
21 piece; say grid outage, for example. Or you could  
22 look at this way, where you could say, Well,  
23 regardless of that, assuming that it's been accounted  
24 for in some meaningful way, and then you introduce the  
25 actual Core Damage Frequency of these SAMDAs you find

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1 that you don't get to a situation where you will find  
2 a cost-beneficial SAMDA for the proposed plants.

3 JUDGE GIBSON: Okay.

4 MR. EMCH: Let me try to -- try it a  
5 little bit different. Can we go back to the table --  
6 it was 12, I believe -- yes, 12 on page -- was it 60?

7 MR. RISHEL: Yes.

8 MR. EMCH: Page 60.

9 JUDGE GIBSON: Assume you'll be very  
10 brief. There's just some other point you needed to  
11 make?

12 MR. EMCH: Yes, sir.

13 JUDGE GIBSON: Okay.

14 MR. EMCH: Oh, actually, it's not that  
15 one. It's the -- 13? Yes, Table 13 on page 62.

16 Throughout the testimony, both --

17 JUDGE GIBSON: Just a minute. Let him get  
18 Table 13 up there. Okay.

19 MR. EMCH: Throughout the testimony --  
20 throughout our testimony we talked about the fact that  
21 it -- the original analysis was a screening analysis.

22 JUDGE GIBSON: Right.

23 MR. EMCH: And I can tell you from my  
24 experience that all the SAMDA analyses are usually --  
25 start out as a screening analysis. They make some

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1 very conservative assumptions such as the ones that  
2 Jeremy was talking about, about the -- that each of  
3 the SAMDAs will make all of the residual risk of the  
4 plant go to zero.

5 JUDGE GIBSON: Uh-huh.

6 MR. EMCH: Okay? So instead of one or two  
7 times ten to the minus seven you're actually talking  
8 zero. Okay. That's not possible. Okay. That's the  
9 point -- one of the points Jeremy was trying to make.  
10 So when you do the analysis that way and that last  
11 column comes up like, 100, 200, 1,000 you say, We're  
12 done, okay, we just did a very conservative analysis  
13 and we didn't come anywhere close, there is no need to  
14 refine the analysis.

15 JUDGE GIBSON: Uh-huh.

16 MR. EMCH: Okay. However, what we found  
17 as we started incorporating the various issues that  
18 the Intervenor had raised --

19 JUDGE GIBSON: When you say incorporating  
20 the issues you mean accepting their numbers?

21 MR. EMCH: The economic --

22 JUDGE GIBSON: Okay.

23 MR. EMCH: -- factors. Right. Yes.

24 JUDGE GIBSON: Okay.

25 MR. EMCH: You can see the third line down

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1 there. We got down to a -- in our parlance the gap  
2 narrowed to 1.4.

3 JUDGE GIBSON: Uh-huh. Okay.

4 MR. EMCH: When you get into that range  
5 then you say, Okay, we need to do a more refined  
6 analysis, it's time to move away from the screening  
7 analysis because --

8 JUDGE GIBSON: Right.

9 MR. EMCH: -- the screening analysis told  
10 us that --

11 JUDGE GIBSON: Right.

12 MR. EMCH: -- something's close.

13 JUDGE GIBSON: I got that. Now, where is  
14 1.4 on there? Did you mean 1.3?

15 MR. RISHEL: The third line, last column.

16 JUDGE GIBSON: Okay. The third line.  
17 Okay. 1.4. Okay. That's good.

18 Okay.

19 MR. EMCH: What -- could I give one more  
20 point on this, sir?

21 JUDGE GIBSON: Okay. Please.

22 MR. EMCH: What we're trying to say about  
23 preventive versus mitigative SAMDAs. If the  
24 preventive SAMDA will -- the presumption is that you  
25 may be able to avoid core damage.

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1 JUDGE GIBSON: Uh-huh.

2 MR. EMCH: Okay. And that's why if you  
3 can avoid core damage you'll probably be shut down for  
4 some period of time because of investigations and  
5 things like that but you probably will not have the  
6 longer-term shutdown that you would get -- if you  
7 actually get core damage you're going to be down for  
8 awhile.

9 JUDGE GIBSON: Right.

10 MR. EMCH: For a long while. Okay.  
11 Versus the mitigative SAMDAs, which it says -- the  
12 analysis says you're -- you are going to get core  
13 damage. Okay. The --

14 JUDGE GIBSON: Uh-huh.

15 MR. EMCH: The mitigative SAMDAs say,  
16 We're going to do something that reduces the amount of  
17 radioactive material that gets released, reduces -- it  
18 will eventually reduce the consequences. You know,  
19 less release means less consequences --

20 JUDGE GIBSON: Right.

21 MR. EMCH: -- okay, to the public, et  
22 cetera.

23 JUDGE GIBSON: All right.

24 MR. EMCH: And so that's the difference  
25 here. And the release goes into Chapter -- I'm

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1       sorry -- Table 12 again, on page 60. And what Jeremy  
2       was trying to point out is the mitigative SAMDAs will  
3       give you some improvement on the first four lines up  
4       there, the public exposure, property damage,  
5       occupational exposure and in reality, cleanup and  
6       decontamination, even though the equations don't show  
7       that.

8               But the big contributor here, the  
9       overwhelmingly large contributor here is the  
10      replacement power. And in order to have an impact on  
11      that you need to have -- the SAMDA needs to reduce  
12      Core Damage Frequency. That was our point.

13             JUDGE GIBSON: Okay. Thank you. I  
14      believe we are ready to recess for the day. I believe  
15      that concludes our testimony with respect to  
16      Contention CL-2.

17             And again your witnesses, I think, can be  
18      released. I don't think we're going to have any  
19      reason to call them back for anything on CL-2  
20      tomorrow. We all pretty comfortable with that  
21      assumption?

22             MR. EYE: Yes.

23             JUDGE GIBSON: Okay. And we'll stand in  
24      recess. And we'll reconvene at 9:30 in the morning  
25      here.

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1 And remember, put your badges out on the  
2 security desk. Thank you.

3 (Whereupon, at 5:50 p.m., the hearing was  
4 recessed, to reconvene at 9:30 a.m., Friday, August  
5 19, 2011.)  
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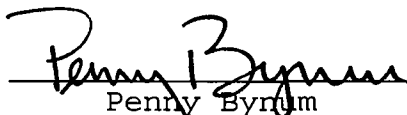
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   Units 3 & 4

Name of Proceeding: Hearing

Docket Number:                52-012-COL and 52-013-COL

Location:                        Austin, Texas

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