

EVIDENTIARY HEARING  
BEFORE THE  
CALIFORNIA ENERGY RESOURCES CONSERVATION  
AND DEVELOPMENT COMMISSION

In the Matter of:                    )  
  )  
Application for                        )  
Certification for the                 ) Docket No. 99-AFC-1  
ELK HILLS POWER PROJECT         )  
\_\_\_\_\_                                  )

CALIFORNIA ENERGY COMMISSION  
FIRST FLOOR HEARING ROOM A  
1516 NINTH STREET  
SACRAMENTO, CALIFORNIA

TUESDAY, MAY 16, 2000  
9:00 A.M.

Reported by:  
Debi Baker  
Contract No. 170-99-001

COMMITTEE MEMBERS PRESENT

Michal C. Moore, Presiding Member

STAFF PRESENT

Major Williams, Jr., Hearing Officer

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Kerry Willis

Marc S. Pryor

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PETERS SHORTHAND REPORTING CORPORATION (916) 362-2345

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## 1 P R O C E E D I N G S

2 9:00 a.m.

3 PRESIDING MEMBER MOORE: Good morning,  
4 I'm Michal Moore. I'm a Commissioner here at the  
5 California Energy Commission and we will be  
6 conducting further evidentiary hearings today on  
7 the Elk Hills project.

8 And I'm joined on the dias by our  
9 Hearing Officer, Major, who is going to take this  
10 over in just a moment. Ellen Townsend-Smith on  
11 the far right, who is representing Commissioner  
12 Pernell. And Melissa Jones, who is here  
13 representing my office on this project.

14 And with that, I'm going to go to Major  
15 and we'll conduct the hearing.

16 HEARING OFFICER WILLIAMS: Good morning.  
17 We are here this morning to conduct evidentiary  
18 hearings on the application for certification for  
19 the Elk Hills Power Plant, docket number 99-AFC-1.

20 The parties who were last present in the  
21 hearing are again present. I would like  
22 interested individuals who are attending this  
23 hearing to identify themselves by name and  
24 organization. I don't believe that mike is  
25 working. That center mike, it's not working. So,

1 court reporter, how would you like -- can we use  
2 your mike, Mr. Miller?

3 MR. MILLER: My mike is available  
4 anytime I'm not speaking.

5 (Laughter.)

6 HEARING OFFICER WILLIAMS: Okay. Also,  
7 for the folks who are coming forward to identify  
8 themselves, if you have a business card would you  
9 please present that to the court reporter, so she  
10 can have that for the spelling of your names and  
11 so forth.

12 I believe the Public Adviser is here, or  
13 a representative. Wanda, would you like to come  
14 forward and present cards, or whatever.

15 MS. YEPEZ: Good morning. My name's  
16 Wanda Yezpe. I'm the Associate Public Adviser  
17 from the Public Adviser's office. If anyone from  
18 the public would like to address the Commission  
19 today, please see me and I will give you one of  
20 these blue cards. And they will recognize you and  
21 allow you to speak.

22 HEARING OFFICER WILLIAMS: Okay. So,  
23 for those folks who are here visiting, whether or  
24 not you're offering testimony, would you please  
25 come forward and identify yourself at this point.

1                   PRESIDING MEMBER MOORE:  If you're  
2                   observing you don't -- I don't know if that's  
3                   necessary, but if you're interesting in  
4                   participating.

5                   MR. DANZIGER:  Robert Danziger from  
6                   Sunlaw GoalLine.

7                   HEARING OFFICER WILLIAMS:  Thank you,  
8                   sir.  Do you have a business card with you?

9                   MR. DANZIGER:  Yes, I do.

10                  HEARING OFFICER WILLIAMS:  Thank you.

11                  MR. OEGEMA:  I'm Rick Oegema with ABB  
12                  Alstom Power.

13                  HEARING OFFICER WILLIAMS:  Thank you,  
14                  sir.

15                  MR. EPSTEIN:  Good morning, I'm Barry  
16                  Epstein, Fitzgerald, Abbott and Beardsley, counsel  
17                  for Sunlaw and GoalLine.

18                  HEARING OFFICER WILLIAMS:  Thank you.

19                  DR. COUPPIS:  My name is Evis Couppis  
20                  and I'm with R.W. Beck.

21                  HEARING OFFICER WILLIAMS:  Thank you.

22                  MR. CLARK:  And my name is Ivan Clark  
23                  and I'm from R.W. Beck.

24                  HEARING OFFICER WILLIAMS:  Thank you,  
25                  sir.  Is there anyone else who would care to come

1 forward at this time?

2 MR. TOMLIN: Steve Tomlin, Air Pollution  
3 Control District, San Joaquin Valley.

4 HEARING OFFICER WILLIAMS: Thank you.

5 MR. SADREDIN: Seyed Sadredin, Director  
6 of Permit Services with San Joaquin Valley Air  
7 Pollution Control District.

8 HEARING OFFICER WILLIAMS: Thank you.

9 Okay, on May 4, 2000, the Committee  
10 issued a revised notice confirming today's  
11 hearing. During the course of today's hearing the  
12 Committee will take occasional short recesses, as  
13 well as a lunch break to be announced later. The  
14 revised notice indicated scheduled hearings today  
15 and a continuation of today's hearing, if needed,  
16 on May 30, 2000, to complete the topics.

17 Evidentiary hearings are formal in  
18 nature, similar to court proceedings. The purpose  
19 of the hearings is to receive evidence, including  
20 testimony, and to establish the factual record  
21 necessary to reach a decision in this case.

22 Applicant has the burden of presenting  
23 sufficient substantial evidence to support the  
24 findings and conclusions required for  
25 certification of the proposed facility.

1           The order of testimony will be taken as  
2 follows for each topic: Applicant, staff, and  
3 CURE.

4           I understand that CURE has proposed to  
5 offer testimony from Mr. Danziger and Mr. Hilton,  
6 is that right?

7           MS. POOLE: Yes, Mr. Hearing Officer.  
8 Mr. Oegema is appearing here in Mr. Hilton's  
9 stead. Mr. Hilton is in attendance, but he'll  
10 have to leave about mid-day.

11          HEARING OFFICER WILLIAMS: Did you  
12 provide any proposed testimony for these --

13          MS. POOLE: No, since they're not CURE  
14 witnesses, we did not.

15          HEARING OFFICER WILLIAMS: Because we  
16 want to make it clear that the Committee accepted  
17 your invitation to invite the witnesses on CURE's  
18 behalf. And the Committee was of the expectation  
19 that you would be sponsoring those witnesses.

20          MS. POOLE: That's fine, we understand  
21 that.

22          HEARING OFFICER WILLIAMS: Applicant, do  
23 you have any comment that you'd like to make on  
24 that procedure at this time?

25          MR. MILLER: Ms. Luckhardt will have a

1 comment on that.

2 MS. LUCKHARDT: I guess I'm a little  
3 interested in what you'd like to hear from us at  
4 this point, because it's my understanding that you  
5 had acted, that if Ms. Poole is here to present  
6 these witnesses without prefiled testimony, then  
7 we intend to do the same thing with our witnesses.

8 We are willing to have these witnesses  
9 go forward with comment at this point in time,  
10 which might be more appropriate seeing as there's  
11 no prefiled testimony.

12 But it's, you know, I don't know if you  
13 want me to launch into, you know, the whole  
14 frustrations and difficulties we've had with  
15 what's gone on in the last week and a half.

16 We were very surprised to see the action  
17 on the part of the Hearing Officer to call a  
18 witness that, to our impression, seemed to be a  
19 request to be a Committee witness. Obviously we  
20 were under a misunderstanding in that regard, as  
21 you've just clarified.

22 We still find it highly unusual for the  
23 Commission to act in an ex parte fashion, which is  
24 how it acted in this situation. We had not even  
25 received the request by the time the Committee had

1 acted.

2 Furthermore, we find the testimony and  
3 presentation of Mr. Danzinger, in this situation,  
4 as a direct competitor, and therefore we find his  
5 presence here and presentation without prefiled  
6 testimony to be highly unusual, and very much out  
7 of order in this situation. Especially if he were  
8 to be called by the Committee.

9 If he is here to testify on behalf of  
10 CURE, then we would expect prefiled testimony in  
11 this instance. And the same would be reflected on  
12 Mr. Hilton.

13 So I think our request would be that  
14 these individuals come in as comment, since we  
15 have not had the advantage of prefiled testimony.  
16 And we would be willing to offer our witnesses who  
17 have not filed prefiled testimony for comment, as  
18 well.

19 But should these individuals come in as  
20 witnesses providing testimony, we would like the  
21 same treatment of ours.

22 HEARING OFFICER WILLIAMS: Thank you.

23 Staff?

24 MS. WILLIS: I think we would agree that  
25 we would prefer Mr. Danzinger and Mr. Hilton, or

1 his substitute, be just to provide comment as  
2 opposed to testimony under oath. It just creates  
3 an unfair, you know, disadvantage for us where we  
4 can't look at the testimony in advance, and be  
5 able to look into it and provide adequate cross-  
6 examination.

7 HEARING OFFICER WILLIAMS: Ms. Poole.

8 MS. POOLE: Thank you. The reason that  
9 we did not file prefiled testimony, and we made  
10 the request of the Committee, is because these  
11 parties would not agree to appear on CURE's  
12 behalf.

13 However, we thought that as the  
14 developer and the vendor of SCONOX, they would be  
15 able to provide valuable information in these  
16 hearings. There has been all sorts of discussion  
17 about what the vendors will and will not provide  
18 in these hearings. And the vendors are in the  
19 best position to respond to those allegations.

20 I also find it highly unusual that Ms.  
21 Luckhardt is objecting to Mr. Danzinger coming in  
22 as a competitor, when Elk Hills has, itself,  
23 sponsored the testimony of Three Mountain's, I  
24 believe, Project Manager, Marty McFadden. So I  
25 don't understand that objection at all.

1                   MS. LUCKHARDT: That's in direct  
2 response to your request to place Mr. Danzinger on  
3 the stand.

4                   HEARING OFFICER WILLIAMS: Okay, thank  
5 you. We'll be back in just a minute.

6                   (Pause.)

7                   HEARING OFFICER WILLIAMS: Okay, the  
8 Committee has decided to take the testimony as  
9 comment. And there was no prefiled testimony, nor  
10 an offer of proof as to what the witnesses  
11 specifically would testify about.

12                   So, under those conditions, I think in  
13 fairness to all the parties, that we're going to  
14 proceed and take those matters as comment at the  
15 time that we set forth in the notice.

16                   MS. POOLE: Just for clarification in  
17 the future, how would you want a party to address  
18 this situation when they're not presenting  
19 witnesses on their own behalf?

20                   HEARING OFFICER WILLIAMS: Clearly the  
21 Committee believes it has the discretion to  
22 support any party in their request to have  
23 witnesses present to offer sworn testimony on that  
24 party's behalf.

25                   And certainly whether or not the

1 Committee, itself, is predisposed or not, when a  
2 party comes forward and requests the Committee's  
3 assistance to provide witnesses here, generally  
4 this Committee has shown an inclination to do so.

5           However, that has to be tempered with  
6 any possible prejudice to the other parties. And  
7 when a party does not file prefiled testimony, or  
8 at least an offer of proof as to what those  
9 witnesses will be testifying about, in those  
10 circumstances the Committee -- the Committee's  
11 will to assist the party in --

12           MS. POOLE: Well, it was my intent that  
13 the cover letter to our prefiled testimony on May  
14 9th was an offer of proof. If that wasn't  
15 specific enough, perhaps that's the Committee's  
16 issue. But, you know, these parties -- we  
17 identified these parties, we described how we  
18 thought they would be relevant to these hearings  
19 and the subject matters that they could address.

20           I believe that is an offer of proof.

21           HEARING OFFICER WILLIAMS: Well, the  
22 Committee's made its ruling, and it will stand.

23           MS. POOLE: We understand. Shall we  
24 launch into the applicant's additional witnesses?

25           HEARING OFFICER WILLIAMS: Well, the

1 same ruling applies to the applicant. Any  
2 witnesses that the applicant has provided in  
3 response to your request for Mr. Danzinger and Mr.  
4 Hilton, will also come in as comment.

5 Witnesses will testify under oath or  
6 affirmation. During the hearing the party  
7 sponsoring the witness shall establish the  
8 witness' qualifications, and ask the witness to  
9 summarize their prepared testimony.

10 Relevant exhibits should be offered into  
11 evidence at that time.

12 At the conclusion of the witness' direct  
13 testimony, the sponsoring party should move in all  
14 relevant exhibits to be received into evidence.

15 The Committee will next provide the  
16 other parties an opportunity for cross-examination  
17 followed by redirect and recross-examination as  
18 appropriate.

19 Multiple witnesses may testify as a  
20 panel. The Committee may also question the  
21 witnesses.

22 Upon conclusion of each topic area we  
23 will invite members of the public to offer unsworn  
24 public comment. Public comment is not testimony  
25 and a Committee finding cannot be based solely on

1 such comments. However, public comment may be  
2 used to explain evidence in the record.

3 Are there any questions at this point?

4 Okay, we will now begin with the applicant's air  
5 quality presentation. All witnesses will be sworn  
6 by the court reporter.

7 MR. MILLER: I believe all of our  
8 witnesses, other than Mr. Abreu, have been  
9 previously sworn. Maybe we can swear him right  
10 now.

11 HEARING OFFICER WILLIAMS: That would be  
12 fine.

13 Whereupon,

14 ALBERTO ABREU  
15 was called as a witness herein, and after first  
16 having been duly sworn, was examined and testified  
17 as follows:

18 MR. MILLER: We have four witnesses to  
19 present, and this is a little louder than usual,  
20 it seems. Mr. Rowley will be our first witness;  
21 Mr. Abreu will be our second witness; Mr. Champion  
22 will be our third witness; and Mr. Radis will be  
23 our fourth witness.

24 Upon the conclusion of the direct, we  
25 could offer them as a panel for cross if that's

1 acceptable.

2 With that, I'll begin with Mr. Rowley.

3 Whereupon,

4 JOSEPH H. ROWLEY, STEVEN R. RADIS and

5 DENNIS CHAMPION

6 were called as witnesses herein, and having been  
7 previously duly sworn, were examined and testified  
8 further as follows:

9 DIRECT EXAMINATION

10 BY MR. MILLER:

11 Q Could you restate your full name for the  
12 record, please?

13 A My name is Joseph H. Rowley.

14 Q And your occupation?

15 A I'm Director of Project Development for  
16 Sempra Energy Resources, and also Vice President  
17 of Elk Hills Power.

18 Q You have given your experience in  
19 previous hearings. Could you repeat that with an  
20 emphasis upon the air quality and the technology  
21 review issues?

22 A Sure. I have a degree in chemical  
23 engineering, 1980. I've been licensed as a  
24 mechanical engineer in the State of California  
25 since 1983.

1           I have 20 years of experience in  
2           licensing, design, construction and operation of  
3           power generation facilities.

4           From 1983 till 1990 served on the  
5           Electric Power Research Institute, Advanced Fossil  
6           Power Systems Task Force. From 1988 to 1990 I  
7           chaired the Gassification Combined Cycle Program  
8           Committee of EPRI, which includes EPRI's combined  
9           cycle program.

10           During this time I also served on EPRI's  
11           Gas Turbine Program Committee.

12           Q     Could you please explain the purpose of  
13           your testimony today?

14           A     First I'd like to summarize the overall  
15           project components that are associated with air  
16           quality issues.

17           Q     Before we get to that perhaps we could  
18           take care of sponsoring the exhibits. Are you  
19           sponsoring any portions of the application for  
20           certification, exhibit 1?

21           A     I'm sponsoring section 3.0, facility  
22           design, facility description and location. And  
23           that includes section 31144, which is NOx control  
24           alternatives.

25           Also I'm sponsoring appendices K4, K5

1 and K11.

2 Q Are you sponsoring portions of any other  
3 exhibits?

4 A I'm sponsoring from exhibit 2A, the  
5 responses to data requests number 1 and also  
6 number 3 through number 7.

7 Q Do you have any corrections to make to  
8 those exhibits that you're sponsoring?

9 A No, I don't.

10 Q Do you have any further testimony then  
11 regarding facility design that you were about to  
12 give a moment ago?

13 A The project consists of two General  
14 Electric Frame 7FA gas turbines. Each gas turbine  
15 is equipped with dry low NOx combustors, and each  
16 gas turbine has a dedicated heat recovery steam  
17 generator, or HRSG.

18 Each HRSG is equipped with an oxidation  
19 catalyst for carbon monoxide control, followed by  
20 selective catalytic reduction or SCR for NOx  
21 control to 2.5 ppm at 15 percent O2 over a one-  
22 hour average.

23 The project will burn exclusively  
24 natural gas. And the cooling towers associated  
25 with the project will be equipped with high

1 efficiency drift eliminators.

2 Q Could you give us a further background  
3 description of how the SCR system for NOx control  
4 works? And since we're going to be getting into  
5 SCONox today, perhaps you could also briefly  
6 summarize how that technology works, as well?

7 A First of all, SCR is a technology that's  
8 very simple. It's well established. I've managed  
9 power plants that operate SCR systems.

10 Basically it's a continuous, single step  
11 reaction where NOx or oxides of nitrogen and  
12 ammonia go in, and on a continuous basis water and  
13 ordinary nitrogen come out. There are no moving  
14 parts. And it's a continuous reaction.

15 In contrast, SCONox is quite a complex  
16 process. I'll have to simplify it considerably in  
17 order to relate in a short time all of the various  
18 steps that are associated with the process.

19 In contrast to SCR, which is a  
20 continuous process, SCONox is a five-step batch  
21 process. It operates in a repeating series of  
22 transient chemical reactions. To accommodate the  
23 batch processing SCONox requires extensive moving  
24 parts. Actuators that drive shafts. The shafts  
25 are connected to dampers. The dampers have

1 mechanical seals.

2           The first step of this five-step process  
3 is that NOx or oxides of nitrogen are oxidized to  
4 NO2. The NO2 is absorbed by the SCONOx catalyst,  
5 and the SCONOx catalyst is coated with potassium  
6 carbonate.

7           As the catalyst absorbs NO2, the  
8 potassium carbonate coating is gradually converted  
9 to potassium nitrate and potassium nitrite over a  
10 period of several minutes. And this process gives  
11 off carbon dioxide.

12           After several minutes all of the  
13 potassium carbonate in the catalyst is converted,  
14 and the catalyst will no longer absorb NOx.

15           That brings us to step two. Since the  
16 catalyst will no longer absorb NOx, after just  
17 several minutes, the catalyst has to be  
18 regenerated. In this regeneration process a  
19 section of the catalyst is sealed off in a  
20 compartment by closing dampers that have seals on  
21 them. It's important that the regeneration  
22 process take place in an oxygen-free environment,  
23 otherwise it won't work.

24           The sealed compartment has a mixture of  
25 hydrogen gas and carbon dioxide admitted into it.

1 And as hydrogen gas and carbon dioxide react with  
2 the potassium nitrite and potassium nitrate,  
3 converting it back to potassium carbonate, and  
4 giving off nitrogen and water.

5 Since potassium carbonate is the  
6 original coating on the catalyst, the dampers are  
7 then opened and the catalyst can then absorb NOx  
8 as it did before in step one.

9 Step three is the production of the  
10 regeneration gas that's used in step two. In the  
11 production of regeneration gas, natural gas and  
12 steam are combined into a reformer reactor where a  
13 chemical reaction occurs in the presence of a  
14 catalyst. This is a different catalyst than a  
15 SCONOx catalyst that occurs in a different space.

16 The natural gas and steam are partially  
17 converted to hydrogen and carbon dioxide and other  
18 products. Because the conversion is partial,  
19 there's also remaining natural gas and so forth.

20 This product is the regeneration gas  
21 that's used in step two. But because the reformer  
22 catalyst is very readily poisoned or deactivated  
23 by sulfur compounds which ordinarily occur in  
24 natural gas, the natural gas has to be first  
25 stripped of sulfur compounds before it's admitted

1 into the reformer.

2 That brings us to step four. Actually  
3 step four comes before step one. As I mentioned,  
4 the reformer catalyst is readily poisoned by  
5 sulfur compounds. This is also true of the SCONOx  
6 catalyst. It's deactivated or poisoned by sulfur  
7 compounds, so these compounds must be removed from  
8 the gas turbine exhaust before they reach the  
9 SCONOx catalyst.

10 To accomplish this another system called  
11 a SCOSOx system is installed upstream of the  
12 SCONOx catalyst. The SCOSOx system is similar to  
13 the SCONOx except that the SCOSOx absorbs sulfur  
14 oxides instead of nitrogen oxide.

15 Step five of the process is the  
16 regeneration of the SCOSOx catalyst. It uses the  
17 same regeneration gas as the SCONOx system.

18 So, whereas SCR is again a single step  
19 process that operates on a continuous basis and  
20 can be explained in a couple sentences, it's  
21 apparent that SCOSOx is quite a convoluted,  
22 complex process. And it's a batch process that  
23 involves moving parts and so forth.

24 Q One clarification. The SCONOx and  
25 SCOSOx equipment that you just described, could

1 you explain where that is installed in the process  
2 of the power generation process?

3 A The SCONOx system that's proposed by ABB  
4 Alstom for large combined cycles operates at a  
5 temperature of 600 to 700 degrees Fahrenheit. And  
6 so it would be situated inside the HRSG in a  
7 similar location as the SCR.

8 The SCOSOx system would also be in the  
9 HRSG, but upstream of the SCONOx system. The  
10 reformer reactor could be located inside the HRSG,  
11 although there's some hazards associated with  
12 that, since the reformer uses natural gas as a  
13 make-up, and ordinarily you want to leave -- or  
14 you want to keep combustibles out of the HRSG.

15 But it has been proposed to put the  
16 reformer in the HRSG, or it can be located outside  
17 as a separate reactor.

18 Q Thank you. Could you now please  
19 address, in a little more general terms, the  
20 general process for demonstrating a new  
21 technology, based on your experience?

22 A Demonstration is the key step in the  
23 technology transfer process. It's the link  
24 between research and development and commercial  
25 operation.

1                   During demonstration of the technology  
2                   scale-up issues are resolved and the technology is  
3                   tested in real world operating situations.

4                   In my work at EPRI I had the opportunity  
5                   to participate in the demonstration of three major  
6                   power generation technologies, gassification  
7                   combined cycle, the F technology gas turbine, and  
8                   also selective catalytic reduction.

9                   In each one of these cases full scale  
10                  demonstration of the technology was expensive and  
11                  it presented some difficult engineering and  
12                  operational challenges.

13                  Those technologies were demonstrated in  
14                  a different era of this industry. And during that  
15                  time the demonstration costs were partially  
16                  supported by the proponents of the technologies.  
17                  And partially by utility ratepayers.

18                  In no case was a private party required  
19                  to demonstrate a technology proposed by another at  
20                  that private party's cost without support from  
21                  society in some form, either through utility RD&D  
22                  budgets or above-market SO4 contracts and so  
23                  forth.

24                  Q     Could you contrast, then, with that  
25                  background, the challenges posed by further

1 demonstrating the SCONox technology as contrasted  
2 to SCR?

3 A In the late 1980s in my work with EPRI I  
4 participated in what is considered to be the  
5 definitive scale-up study for SCR; and a study  
6 that established the workability of the technology  
7 on a large scale.

8 That study involved projects that were  
9 on a small scale, and that over time were  
10 demonstrated on a large scale.

11 So even though SCR is a relatively  
12 simple technology, it still is expensive and  
13 fairly involved to demonstrate.

14 The risk of demonstration was mitigated  
15 by a stepwise scale-up process. SCR was tested on  
16 a bench scale. It was tested on 20 megawatt gas  
17 turbines, 40 megawatt gas turbines, 80 megawatt  
18 gas turbines.

19 By the time the technology was installed  
20 in 160 megawatt gas turbines, the scale-up risk  
21 was highly mitigated, and the scale-up issues were  
22 well understood.

23 The lessons learned on one demonstration  
24 project were applied to the next demonstration  
25 project. There wasn't a rush to field multiple

1 demonstration projects in parallel with each other  
2 that would not have the ability to learn from the  
3 preceding project.

4 In contrast, SCONox with its multiple  
5 steps and moving parts presents a much greater  
6 challenge.

7 With selective catalytic reduction, one  
8 of the main scale-up challenges was getting even  
9 distribution of ammonia moving into the SCR  
10 catalyst. In the demonstration projects this  
11 always didn't work right at first, and it was  
12 necessary to go inside the HRSG and to modify the  
13 ammonia injection grid in order to try different  
14 things, different numbers of nozzles, different  
15 types of nozzles, different configurations of  
16 nozzles.

17 And this process, a trial and error for  
18 SCR, was relatively quick and cheap. You can go  
19 inside the HRSG and cut out this small diameter  
20 ammonia injection piping and reweld it rapidly and  
21 test something else.

22 In contrast, SCONox, with its reliance  
23 upon large dampers and hundreds or thousands of  
24 feet of mechanical seals, does not present the  
25 same situation. Also SCONox is a batch process,

1 as I described, it's not a continuous process.

2 From a chemical engineering perspective  
3 a batch process is more difficult to scale up.  
4 Also SCONOx uses combustibles in the process that  
5 just make an added complication to the application  
6 of the technology in the real world situations  
7 where things don't always work right.

8 The scale-up proposed by ABB Alstom  
9 involves going from the current state of the  
10 technology, which, keeping in mind that the  
11 application of SCONOx proposed by ABB Alstom for  
12 large gas turbines is at the 600 to 700 degree  
13 range, with integration of SCOSOx.

14 Such a demonstration today only exists  
15 at one facility. And that's a five megawatt  
16 facility at the Genetics Institute. There is talk  
17 about the 28 megawatt facility at the Federal  
18 Cogeneration plant in Vernon, but that facility  
19 operates only at 300 degrees and does not include  
20 SCOSOx.

21 Catalysis is highly temperature  
22 dependent and it's evident that the technology in  
23 going from 300 degree to 600 degrees has  
24 experienced some growing pains, even though the  
25 size went down from 28 megawatts to 5 megawatts.

1                   To try to now scale up from 5 megawatts  
2                   with this incorporation of high temperature, 600  
3                   degree catalyst of SCOSOx, to scale up from that  
4                   level to 160 or 170 megawatts represents a 30-fold  
5                   scale-up. And that is -- that's beyond  
6                   adventurous.

7                   I think the technology proponent would  
8                   have to have extremely deep pockets, and have a  
9                   very strong desire to bypass the normal  
10                  demonstration process in order to put that kind of  
11                  an investment at risk.

12                 Q     Thank you. It might help, just for  
13                   clarification for the Committee and some of the  
14                   laymen in the room, for you to simply explain what  
15                   HRSG stands for, and what that does, the process,  
16                   so that you can maybe better describe the  
17                   environment in which the SCONOx equipment must  
18                   operate.

19                 A     The combustion turbine from a 7F gas  
20                   turbine -- a 7F gas turbine exhausts at around  
21                   1100 degrees. That 1100 degree exhaust is ducted  
22                   into a heat recovery steam generator that's used  
23                   to make steam for the combined cycle process.

24                   The exhaust cools off as it passes  
25                   through the heat recovery steam generator, or

1 HRSG. Once it's cooled off to the 600 to 700  
2 degree range, which is partway through the HRSG,  
3 then you have an environment where the SCR, or  
4 SCONox catalyst will function.

5 And the mechanical dampers and seals and  
6 so forth would have to survive in that 600 to 700  
7 degree environment.

8 Q And the dampers, essentially what you're  
9 referring to is an opening and shutting door for a  
10 large box, is that correct?

11 A Right, because the regeneration process  
12 needs to occur in the absence of oxygen, the box  
13 around a portion of the catalyst, and it's about  
14 one-fifth of the catalyst that's regenerated at  
15 any given time, that box has to be closed by  
16 essentially closing in the front end and closing  
17 in the back end with the sides already previously  
18 being closed in by the structure.

19 And the dampers, to accomplish this  
20 oxygen-free environment, need to not only close,  
21 but also seal. And therefore the dampers have  
22 seals around their edges that seal this box in  
23 this 600 to 700 degree environment.

24 Q And how large would a damper arrangement  
25 such as you've described need to be for a 7F

1 machine?

2 A It would have to extend all the way  
3 across the width of the HRSG, which is anywhere  
4 from 25 to 32 feet.

5 Q How large are the ones at the Genetics  
6 Institute Facility, if you know?

7 A Well, the overall size of the facility  
8 is less than one-thirtieth the size of a 7F gas  
9 turbine. I'm not sure exactly how that translates  
10 in terms of the width of the HRSG.

11 Q Thank you.

12 A Or the box that is on the back side of  
13 that gas turbine.

14 Q Do you have any other comments you'd  
15 like to make in terms of technical challenges to  
16 utilizing the SCONOx?

17 A I think the principal scale-up issues  
18 are the dampers and the seals. Even, uniform  
19 distribution of the regeneration gas. The sulfur  
20 poisoning of the SCONOx catalyst and the  
21 effectiveness of SCOSOx in preventing that  
22 poisoning, or deactivation.

23 And then there's simply the integration  
24 of the overall whole. The thing that you learn in  
25 any demonstration project is that the various

1 pieces, even when scaled up to full scale, don't  
2 always interact with each other the way that you  
3 hoped they would. And so there's always  
4 integration process in making the overall  
5 contraption work.

6 Q One other clarification. The HRSG,  
7 within it are a lot of tubes with steam going  
8 through -- I guess it's not water, but steam, at  
9 that temperature, is that correct?

10 A It's both water and steam in the HRSG.

11 Q Thank you. Now, what if it doesn't  
12 work? What would happen, in commercial terms, if  
13 SCONox were to be installed by a project owner,  
14 and for one reason or another, because of either  
15 some of the problems you've mentioned to maybe  
16 other ones you haven't, haven't thought of, it  
17 doesn't operate satisfactorily to reduce NOx, or  
18 perhaps has some effect on the rest of the power  
19 generation facility equipment?

20 A Well, if it doesn't work, then you can't  
21 meet your obligation to the regulatory agencies to  
22 achieve NOx levels that are in the operating  
23 permit. So that puts you between a rock and a  
24 hard place. You either have to obtain a variance  
25 or you have to shut the plant down.

1                   There's been a lot of talk about  
2                   guarantees from ABB Alstom, but the kind of a  
3                   guarantee that is offered by equipment  
4                   manufacturers, including the guarantees offered by  
5                   ABB Alstom, are not meaningful in mitigating the  
6                   risk of demonstrating a technology.

7                   They're not meaningful because they  
8                   don't cover the lost sales revenues when the plant  
9                   won't operate. They won't pay for your debt  
10                  service or pay your payroll when you can't bring  
11                  in revenues to cover those costs, because the  
12                  plant either won't run at all, or it won't run  
13                  properly.

14                  When I go to another manufacturer that  
15                  has a demonstrated technology, for example we've  
16                  gone to GE and we purchased a gas turbine. GE has  
17                  guaranteed 9 ppm coming out of the back of that  
18                  gas turbine.

19                  They don't put any liquidated damages on  
20                  that number. They don't limit their liability on  
21                  that number. They simply commit to achieve that 9  
22                  ppm.

23                  Now, that commitment, in and of itself,  
24                  does not cover my lost sales revenues or my debt  
25                  service and so forth, if it doesn't work.

1           The difference between that kind of a  
2           commitment and the kind of a commitment that we're  
3           seeing from ABB Alstom for an undemonstrated  
4           technology is that when GE makes the commitment  
5           for their gas turbine, there's a track record that  
6           has established that they're going to make good on  
7           that claim.

8           When you have an undemonstrated  
9           technology there is no such track record, and in  
10          fact, my experience with demonstration would  
11          indicate that the technology is going to have  
12          problems, especially with such a gigantic scale-up  
13          jump. It's going to have severe problems. It may  
14          work through those problems if enough time and  
15          money is thrown at it, but in the meantime the  
16          project is not being covered in terms of its  
17          expected revenues.

18          Q     Would you expect that there would be  
19          possibility that the cost of replacing -- if  
20          SCONox didn't work, for example, would the cost of  
21          taking it out and putting SCR in, in its place, be  
22          covered absent -- I'm not referring to the power  
23          replacement cost, but just the cost of the  
24          construction and installation?

25          A     For the kind of guarantee that ABB

1 Alstom is offering, it's only a fraction of the  
2 cost of the SCONOx system, itself. It certainly  
3 would not even cover the cost of replacing the  
4 system with an SCR. And certainly not cover the  
5 cost of lost revenues during the down time  
6 necessary to make that conversion, nor for the  
7 period of time preceding that during which time it  
8 became apparent that the technology was not going  
9 to be able to make good on its guarantee.

10 Q Just could you make a general judgment  
11 as to how long a plant could be offline to be able  
12 to solve that kind of a problem?

13 A It's not just the offline period, but  
14 it's the period leading up to the offline period.  
15 If, for example, it took two years before there  
16 was a consensus between this Commission and San  
17 Joaquin Valley Unified APCD and the project that  
18 the technology was not going to work, I mean  
19 there's two years of at least partial lost  
20 revenues.

21 Then you have a shutdown period where  
22 you get out the cutting torches and take out the  
23 SCONOx system and replace it with an SCR system.  
24 That could take something on the order of a month  
25 if it was planned very carefully.

1           Q     Would insurance be available to cover  
2     against these -- protect one -- excuse me.  Would  
3     insurance be available to protect a project owner  
4     against these kind of risks?

5           A     Absolutely not.  There is no insurance  
6     for this.  This is business risk.  There's no  
7     insurance for loss of revenues.  There is an  
8     insurance document cited by CURE that talked about  
9     insuring for mechanical breakdown and things of  
10    the like.  But that kind of insurance does not  
11    provide insurance for loss of revenues.  It does  
12    not provide insurance against bank foreclosure.

13                    It does not provide insurance against  
14    the risk to the reliability of the electric system  
15    if there are number of such plants that are having  
16    similar problems in parallel with each other.

17                    It doesn't provide insurance that this  
18    Commission or San Joaquin Valley Unified APCD  
19    would grant an extended or permanent variance to  
20    the project.

21                    So, insurance really is not meaningful  
22    at all in mitigating the risk of demonstrating  
23    this technology.

24           Q     Thank you.

25                    MR. MILLER:  I have no further questions

1 for Mr. Rowley. And so I'll ask him if that  
2 concludes his testimony.

3 MR. ROWLEY: Yes, it does.

4 MR. MILLER: I should probably also ask,  
5 for the record, Mr. Rowley, whether you adopt the  
6 portions of the exhibits identified in your  
7 previous testimony and comments as your true and  
8 sworn testimony in this proceeding?

9 MR. ROWLEY: Yes.

10 MR. MILLER: And it's based upon your  
11 best professional judgment?

12 MR. ROWLEY: Yes, it is.

13 MR. MILLER: And now have you concluded  
14 your testimony?

15 MR. ROWLEY: Yes, thank you.

16 MR. MILLER: Thank you.

17 PRESIDING MEMBER MOORE: Mr. Rowley, I  
18 have a question for you.

19 EXAMINATION

20 BY PRESIDING MEMBER MOORE:

21 Q With regard to the reliability of the  
22 systems, the systems that you're familiar with do  
23 not rely on SCONOX, but rely on a more proven  
24 technology that I assume is incorporated by GE in  
25 their engines that you're talking about buying?

1           A     There are a couple of different  
2 technologies. First of all the dry low NOx  
3 combustors are incorporated into the gas turbines.

4           Q     But when the turbine arrives it's  
5 already got that technology built into it?

6           A     Yes. And then downstream of that, the  
7 SCR is actually built into the HRSG. The HRSG  
8 manufacturer provides the SCR as an integrated  
9 portion of the HRSG.

10          Q     So in a sense, when the engine runs,  
11 even though the SCR is manufactured by someone  
12 else, it is made to specs certified by, in this  
13 case, Westinghouse, or GE?

14          A     Actually, the gas turbine would be  
15 guaranteed by GE. The performance of the SCR and  
16 HRSG would be guaranteed typically by the HRSG  
17 manufacturer, such as Nooter-Erikson.

18                     And then since we're executing the  
19 project on a turnkey basis, there would be a  
20 turnkey contractor that takes both of those  
21 guarantees, the guarantee from GE and the  
22 guarantee from the HRSG manufacturer, and does  
23 what we call wrap the overall project. They  
24 provide a wrap guarantee so that there's just one  
25 guarantee to the project owner, Elk Hills Power.

1           Q     Can you put this in any kind of terms  
2           that would tell me the confidence that you have in  
3           the SCR technology?  In other words, statistically  
4           can you give me a failure rate on that technology?  
5           Or is there one that's published in the industry,  
6           to know what the -- what I'm looking for is a  
7           surrogate for reliability.

8           A     SCR has become a very mature technology.  
9           It basically just sits there in the gas stream and  
10          doesn't do anything other than have exhaust gases  
11          pass through it.

12                 So, there's really no failure of an SCR.  
13          If there's a formulation problem with the catalyst  
14          during start-up --

15          Q     Is that operator error when that  
16          happens?

17          A     No, that would be a manufacturing error.

18          Q     So, once it's calibrated, in a sense it  
19          would be like fitting a standard nozzle to  
20          something.  It's not a variable nozzle, it's just  
21          a standard ratio of components?

22          A     I would say it would be analogous to  
23          bolting a catalytic converter on your car.

24          Q     So once it's up and running it runs  
25          roughly at the same rate over time, no matter

1 what?

2 A Over time there's a deterioration of the  
3 catalyst. The catalyst lasts from three to five  
4 years, and then has to be replaced.

5 Q Are there catastrophic failures that  
6 you'd expect in that period of time? Or have you  
7 witnessed any?

8 A No. It's a very gradual deterioration,  
9 and it's something that's predictable and planned  
10 for.

11 Q So you have a set of curves that show  
12 you what to expect over time, and you can go back  
13 and check that to make sure you're on the curve or  
14 not?

15 A Plotting curves is one way to predict  
16 the performance and to see how it measures up  
17 against the guarantee.

18 The way the SCR is guaranteed is  
19 actually at the end of a period of time. It's  
20 guaranteed for the entire period of time, but the  
21 critical portion of the guarantee is will it meet  
22 design parameters at the end of the three year or  
23 four year or five year --

24 Q It would suggest that in the years prior  
25 to that you're actually exceeding those design

1 parameters, if you have degradation taking place?

2 A Absolutely.

3 Q And so prior to the end of that time  
4 period, using the standard degradation curve or a  
5 predictable degradation curve that you have, the  
6 incidence of failure, or failure to meet the  
7 standard, you're suggesting, is either zero or  
8 small?

9 A The only question is whether the  
10 catalyst will last the full period of the  
11 guarantee. It's sort of like when you buy a set  
12 of tires for your car. They come with a 50,000  
13 mile guarantee. And you operate the car in normal  
14 fashion, then it's going to produce 50,000 miles  
15 by and large.

16 SCR is very much analogous to that. I  
17 mean there's a possibility that the catalyst could  
18 end its life shorter, but then the catalyst  
19 manufacturer would have to prorate the value of  
20 the catalyst to make up for that.

21 Q If that happens, if there's a  
22 catastrophic failure and/or the life of the  
23 catalyst in this case, is what we're referring to  
24 it generically, is shortened. And you're forced  
25 to pull that out of service early, prior to what

1       you would have had on the recommended maintenance  
2       schedule, how long would it be down to replace  
3       those parts, to get the SCR running again?

4           A     Well, first of all, catastrophic failure  
5       is not a significant risk.  But since there's a  
6       planned point in time when the catalyst blocks  
7       will be removed and replaced with new catalyst  
8       blocks, that would occur at an overhaul and --

9           Q     Right, but I'm suggesting what happens  
10      if it fails early?

11          A     Then you would have to do it at an  
12      earlier overhaul.  For example, --

13          Q     And how much time -- you wouldn't do a  
14      full overhaul in that case, right?  You'd just --  
15      you'd pull out the failed parts and put something  
16      else in?

17          A     It would go something like this:  You're  
18      plotting your curve and you see that you're not  
19      going to meet, say your four-year guarantee.  It's  
20      only going to make it to three years.

21                So, you're projecting that in the  
22      future.  Suppose we're in year two, we're not  
23      there yet, it's still working okay, but you can  
24      see that it's not going to make it to year four,  
25      it's only going to make it to year three.

1                   Since there's at least a minor overhaul  
2                   every year, what you would do is plan to replace  
3                   the catalyst during the year three minor overhaul  
4                   instead of during year four. And that process of  
5                   removing the blocks and putting new blocks in can  
6                   easily be accomplished in a one-week turnaround.

7                   Q     And the one-week turnaround corresponds  
8                   with a minor tuneup --

9                   A     Yes.

10                  Q     -- of the facility?

11                  A     Yes.

12                  PRESIDING MEMBER MOORE: Thank you.

13                  Staff?

14                  MR. MILLER: Excuse me, Commissioner.

15                  PRESIDING MEMBER MOORE: I'm sorry, I  
16                  thought he was available for questions.

17                  MR. MILLER: We were planning to have  
18                  the panel --

19                  PRESIDING MEMBER MOORE: I'm sorry, my  
20                  error.

21                  MR. MILLER: -- be available.

22                  PRESIDING MEMBER MOORE: Excuse me.

23                                 DIRECT EXAMINATION

24                  BY MR. MILLER:

25                  Q     Mr. Abreu, --

1 HEARING OFFICER WILLIAMS: Excuse me.  
2 Is that satisfactory to staff and CURE that -- I  
3 think we've been doing it like this before, that  
4 the panel testifies first, and then there's  
5 questions?

6 MS. POOLE: That's fine.

7 MS. WILLIS: That's fine with us.

8 MR. MILLER: I think it tends to  
9 shorten --

10 HEARING OFFICER WILLIAMS: I do, too.

11 BY MR. MILLER:

12 Q Mr. Abreu, could you please state your  
13 name and occupation for the record.

14 A Certainly. Good morning. My name's  
15 Alberto Abreu. I'm Manager of Permitting and  
16 Licensing for Sempra Energy Resources.

17 Q And could you please describe your  
18 educational background and occupational experience  
19 related to your testimony in this proceeding?

20 A I have a bachelors degree in mechanical  
21 engineering from the University of Wisconsin at  
22 Madison. I have a masters in business degree from  
23 the University of San Diego.

24 I have worked for about 15 years plus in  
25 the air pollution control business and in the

1       permitting and licensing field.

2                   I worked for about three years with Kern  
3       County Air Pollution Control District before it  
4       was split and partially merged into the San  
5       Joaquin Valley Unified APCD.

6                   From there I moved on to the San Diego  
7       Air Pollution Control District for about five  
8       years. Then I moved to San Diego Gas and Electric  
9       where I worked for about three years. And then  
10      from there to Semptra Energy Resources.

11           Q       And are you, because of your background  
12      in air quality regulation and permitting work, do  
13      you have various professional associations that  
14      you maintain?

15           A       Yes, I do, as time permits. I'm a  
16      member of AWMA and when I was with the agencies I  
17      worked in various CAPCOA committees and also with  
18      the staff of LAAPCOA and other committees, as  
19      well.

20           Q       Thank you. And CAPCOA is what?

21           A       The California Air Pollution Control  
22      Officers Association, I believe is the correct  
23      acronym.

24           Q       And in the course of this work you have  
25      reviewed or conducted a variety of technology

1 reviews, including what's called best available  
2 control technology review, as mandated by the  
3 Federal and state air quality laws?

4 A Yes, I have. As a regulator I have lost  
5 count, but I've reviewed and prepared and approved  
6 hundreds, if not thousands of best available  
7 control technology determinations.

8 I have specifically reviewed dozens of  
9 power plant related BACT determinations in my  
10 career.

11 Q Are you sponsoring any further testimony  
12 in this proceeding that's attached to your  
13 prefiled testimony? I'll rephrase the question.

14 Are you also sponsoring attachment A to  
15 your prefiled testimony?

16 A Yes, I am.

17 Q Okay. And are you sponsoring any  
18 portions of the application for certification?

19 A Yes, I am.

20 Q Could you recite what portions of the  
21 AFC that you are sponsoring?

22 A Yes, along with Joe Rowley, Dennis  
23 Champion and Steve Radis, I'm sponsoring section  
24 5.2, air quality; appendix K1, protocol for air  
25 quality modeling; appendix K12, compliance

1 analysis; and appendix K13, air emissions offsets  
2 sources.

3 Q Are you sponsoring any portions of any  
4 other exhibits regarding air quality?

5 A No.

6 Q And do you have any corrections to make  
7 to the portions of the exhibits that you are  
8 sponsoring?

9 A No, I do not.

10 Q Do you adopt the testimony included in  
11 attachment A to your prefiled testimony and those  
12 portions of the exhibits you've identified as your  
13 true and sworn testimony in this proceeding?

14 A Yes, I do.

15 Q Would you please summarize your prefiled  
16 testimony?

17 A My testimony provides a project  
18 description, provides a discussion of the affected  
19 environment, provides an analysis of compliance  
20 with the applicable LORS, provides emission  
21 estimates for construction and operation of the  
22 facility.

23 Those emission estimates were used to  
24 conduct air quality dispersion modeling analyses  
25 which demonstrate that impacts from the project

1 will not cause or contribute to violations of the  
2 Federal or state ambient air quality standards.  
3 And that the impacts are below the significance  
4 levels.

5 Emission reduction credits will also be  
6 provided in accordance with federal and state  
7 requirements. Cumulative impacts were also  
8 analyzed and discussed in my testimony. And  
9 determined that no attainment cumulative impacts  
10 would occur.

11 In addition, the testimony provides  
12 responses to CURE's comments to the proposed  
13 determination of compliance, including the fact  
14 that BACT has indeed been required for NOx and for  
15 CO for this project. And that carbon monoxide is  
16 not an ozone precursor.

17 Q Just for the record, this one time when  
18 you say BACT, you're saying that's the acronym for  
19 best available control technology, correct?

20 A Yes, pardon me. BACT means best  
21 available control technology, and there's an  
22 analysis associated with determining what  
23 constitutes best available control technology for  
24 any given project.

25 Q And did you prepare such an analysis for

1 the Elk Hills Power Project?

2 A Yes, I did.

3 Q And that was, I believe, attached to the  
4 staff's final staff assessment as their appendix  
5 D?

6 A Yes.

7 Q In addition to the documents you've  
8 reviewed to prepare that analysis, are there any  
9 other documents that you reviewed in preparation  
10 for explanation of the analysis or review of other  
11 BACT analyses?

12 A Yes, there's a fairly extensive list of  
13 items that were reviewed in preparing those  
14 documents and subsequently the preparation of  
15 those documents.

16 They include the Federal Clean Air Act;  
17 the Code of Federal Regulations, specifically 40  
18 CFR 5221; the California Air Resources Board best  
19 available control technology guidance document;  
20 the South Coast Air Quality Management District's  
21 BACT guidance document; the San Joaquin Valley  
22 Unified APCD's BACT guidance definition and  
23 documents; CEC's final staff assessment; the San  
24 Joaquin APCD's PDOC and FDOC; as well as their  
25 response to CURE's comments on the PDOC; the Three

1 Mountain BACT analysis; Three Mountain's response  
2 to CURE comments; ABB's comments to Elk Hills'  
3 BACT analysis; Stone and Webster's Independent  
4 Technical Review of SCONox technology and design  
5 review; and Towantic Energy's BACT analysis.

6 Q And just for the record, PDOC and FDOC  
7 stand for preliminary determination of compliance  
8 and final determination of compliance, and the  
9 reference to the Stone and Webster report, I  
10 believe, is in attachment 13 to the testimony of  
11 Dr. Fox?

12 A Yes.

13 Q And the Towantic Energy BACT analysis  
14 was appendix C, I believe, to the FSA?

15 A May have been D.

16 Q All right, I think D was the Elk Hills  
17 analysis. In any event, we can be clear that it  
18 was attached to the final --

19 A Yes, it was.

20 Q Could you provide a brief summary of  
21 what is required in a BACT analysis?

22 A Yes, best available control technology  
23 and analysis of the BACT to determine what  
24 constitutes BACT is defined as an emission  
25 limitation which is based on the maximum degree of

1 reduction, which on a case-by-case basis, taking  
2 into account energy, environmental and economic  
3 impacts and other costs, is achievable for a  
4 specific facility under review.

5 EPA has developed various guidance  
6 documents as to how to implement and conduct BACT  
7 analyses. One of the more salient one of these is  
8 a December 1987 guidance memorandum which  
9 contains, among other items, the so-called top-  
10 down methodology for determining BACT.

11 In summary, the top-down methodology  
12 provides a rank, that you identify all available  
13 control technologies and you rank them in  
14 descending order of control effectiveness.

15 The most stringent or top alternative is  
16 first evaluated. That first alternative must, on  
17 a case-by-case basis for the specific application  
18 being looked at, taking into account energy,  
19 environmental and economic impacts, must be  
20 evaluated.

21 Unless these technical considerations or  
22 energy or environmental or economic impacts  
23 justify a conclusion that the most stringent  
24 technology is not achievable in that particular  
25 instance you're looking at, the technology is

1 considered to be BACT.

2 If the most stringent technology is  
3 eliminated, then the next most stringent  
4 alternative is considered and so on. That's why  
5 it's called top-down.

6 Additionally, EPA has provided a manual  
7 called the new source review workshop manual,  
8 which is attachment 19 of Fox's CURE testimony,  
9 which states that -- and this is not a quote, I'll  
10 paraphrase it -- where a control technique has  
11 been applied to only one or a limited number of  
12 sources, as is the case for Elk Hills with SCNOx,  
13 the applicant can identify those characteristics  
14 unique to those sources that made the application  
15 of a control appropriate for those cases, but  
16 which preclude the technology from use to the  
17 source under consideration.

18 Q Thank you. Just to clarify one more  
19 time, we may need to do this again today somewhat.  
20 BACT is not a mandated technology, correct?

21 A No, it is not. It is an emission  
22 limitation. EPA has clarified that various times.

23 Q So, the technology is judged to be  
24 capable of reducing emissions to a certain level,  
25 and that level is what we call BACT?

1           A     Yes, it is. That's correct.

2           Q     And what was your conclusion then with  
3 regard to the BACT analysis that you prepared for  
4 the Elk Hills Project?

5           A     The Elk Hills BACT analysis concludes  
6 that best available control technology for oxides  
7 of nitrogen for the Elk Hills Project is either 2  
8 ppm at 15 percent O<sub>2</sub> averaged over three hours; or  
9 2.5 ppm at 15 percent oxygen averaged over one  
10 hour.

11                   EPA has stated that they consider these  
12 two limitations, the 2 at 3, and the 2.5 at 1 hour  
13 average to be equivalent interchangeable.

14                   We proposed the 2.5 at 50 percent O<sub>2</sub>  
15 over one-hour average as our BACT determination.

16                   The BACT analysis also concludes that  
17 BACT for carbon monoxide is 4 ppm at 15 percent  
18 oxygen averaged over three hours.

19                   As I stated, EPA and, furthermore, San  
20 Joaquin and CEC Staff, all concur that these  
21 emission limitations constitute BACT for this  
22 particular application.

23                   In our analysis we identified SCONOX and  
24 SCR as the two top technologies for control  
25 pursuant to the BACT top-down provisions. We

1 concluded that SCONOx had significant technical  
2 issues that led us to conclude that it is not  
3 technically feasible for this application.

4 Joe Rowley has spoken to some of those  
5 technology issues and I won't repeat them here.  
6 Other than to say that the salient ones include  
7 the fact that the low temperature SCONOx has been  
8 installed in only one facility, which is a 5  
9 megawatt machine. And the application of SCONOx  
10 on the Federal facility is a low temperature  
11 SCONOx application which is not the one that would  
12 be used for Elk Hills. The Elk Hills project  
13 would use a high temperature SCONOx application.

14 Q Did you just say that the 5 megawatt  
15 machine at Genetics was a high temperature and  
16 Federal was a low temperature?

17 A Yes, did I reverse that? I apologize.

18 Q Yes.

19 A Yes, the Genetics Institute SCONOx  
20 application is a high temperature SCONOx catalyst;  
21 and the Federal facility, which is a 25 megawatt  
22 facility, is a low temperature SCONOx application.  
23 I apologize if I reversed that.

24 Q What would the emission limitation be  
25 associated with SCONOx as opposed to the SCR?

1           A     The emission limitation is exactly the  
2           same for both technologies.  They're both  
3           theoretically capable of achieving that emission  
4           limit.  And that emission limit has been  
5           determined to be BACT, as I indicated previously.

6           Q     In addition to the technical issues that  
7           you've mentioned, did you also look at compared to  
8           the cost issues as part of your analysis?

9           A     Yes, as part of the BACT determination,  
10          cost considerations must be taken into account.  
11          The Elk Hills BACT analysis concludes that SCONOx  
12          is not cost effective, as compared to the cost of  
13          other BACT determinations made in the San Joaquin  
14          Valley APCD.

15          The cost effectiveness of SCONOx is  
16          approximately 29,600 tons of NOx removed, which is  
17          three times more the cost -- three times the cost,  
18          pardon me, of SCR and oxidation catalyst  
19          combination, which is approximately \$8500 per ton  
20          of NOx removed.

21          Q     And I believe you may have misspoke  
22          that, the 29,600 was dollars per ton?

23          A     Dollars per ton.  I'm on a roll today,  
24          aren't I?

25          Q     That's all right.  And as to

1 environmental considerations, how would you  
2 summarize the results of your analysis in that  
3 regard?

4 A With regard to environmental  
5 considerations, which is also something that needs  
6 to be reviewed in making a BACT determination,  
7 both technologies have some environmental impacts  
8 associated with them.

9 SCR has some ammonia related issues; and  
10 SCONOx has some water related issues.

11 In my opinion, the environmental issues  
12 associated with either technology alone does not  
13 justify the elimination of that technology from  
14 consideration as BACT. As I stated earlier, the  
15 elimination of SCONOx as technologically feasible  
16 for this project is a technological one, it's not  
17 an environmental one.

18 I will add, also, that the CEC Staff has  
19 found that the environmental considerations  
20 associated with ammonia for this project are  
21 insignificant.

22 Q And can you sum up your analysis,  
23 please?

24 A Yes. To reiterate, BACT is an emission  
25 limitation, not a specific control technology.

1 It's determined on a case-by-case basis, taking  
2 into account technical, environmental and economic  
3 impacts.

4 For NOx, Elk Hills, EPA, San Joaquin and  
5 CEC Staff concur that BACT is 2 ppm, 15 percent  
6 oxygen over a three-hour average; or 2.5 ppm, 15  
7 percent oxygen over a one-hour average. As I  
8 stated, Elk Hills is proposing the 2.5 limit.

9 SCR satisfies all the requirements of  
10 BACT and therefore has been proposed as the  
11 control technology for this application. SCONOX  
12 cannot be considered technically feasible for this  
13 project based on the technological issues that  
14 we've discussed.

15 For CO, Elk Hills, EPA, San Joaquin and  
16 CEC Staff also concur that BACT is an emission  
17 limitation of 4 ppm at 15 percent oxygen averaged  
18 over three hours. And that's what we have  
19 proposed.

20 Q I'd like to turn now to a brief review  
21 of the cost analysis that is set forth in Dr.  
22 Fox's testimony. Could you comment on that  
23 analysis, please?

24 A Yes. Her testimony cites that an  
25 independent cost effectiveness analysis for

1       SCONox, and cites a \$7000 per ton removed value.

2               A review of that analysis, which is  
3       contained in attachment 30 of the Fox testimony,  
4       reveals that the cost effectiveness calculation  
5       was erroneously performed.

6               What they did is they did not account  
7       for the direct and indirect capital costs of the  
8       technology. When they did their cost effectiveness  
9       calculation, the dollars per ton value, they  
10      looked only at the annual direct and indirect  
11      costs of SCONox. They did not add the direct and  
12      indirect capital costs of SCONox.

13              The analysis also seems to ignore the  
14      recoating intervals which occurs at approximately  
15      every 8000 hours. Both of these factors, and  
16      there are others, but both of these factors  
17      specifically cause a significant error in the cost  
18      effectiveness calculation, and the analysis can't  
19      be relied upon because of it.

20              Q     Did you also review additional cost  
21      analysis presented in the testimony?

22              A     Yes. There's also an ABB Alstom Power  
23      cost effectiveness analysis. That states that the  
24      cost value for SCONox is \$19,700 per ton. The ABB  
25      cost analysis is also erroneous, in that it

1 assumes catalyst replacement once every ten years.  
2 And even then you would only replace the front  
3 portion of the catalyst.

4 The warranties, this replacement  
5 schedule is inconsistent with ABB's stated  
6 warranties for SCONOx, which is three years.  
7 Therefore the cost analysis that we performed  
8 assumes a three-year replacement schedule for  
9 SCONOx, as indeed it does for SCR, because that's  
10 also the typical guarantees that one gets from  
11 SCR.

12 And that is consistent with the BACT  
13 cost effectiveness determinations. You have to  
14 assume replacement at the end of the guaranteed  
15 life.

16 The ABB analysis also underestimates  
17 steam and gas consumption for SCONOx. And as a  
18 result of these -- oh, pardon me -- and it also  
19 does not seem to account for the 8000 hour  
20 interval catalyst recoating that must take place.

21 All these factors cause a significant  
22 underestimation of the SCONOx cost in this ABB  
23 analysis.

24 The other analysis that was cited is the  
25 GoalLine analysis. It's unclear to me why

1       GoalLine's estimate varied from those of ABB,  
2       which can lead one to question the uncertainty of  
3       any estimate provided by the parties, but that  
4       aside, the GoalLine estimate suffers from the same  
5       deficiencies that the ABB cost analysis suffers  
6       from, namely under-estimation of steam and gas  
7       consumption costs, catalyst replacement costs, and  
8       catalyst recoating costs.

9                 Additionally, the estimate significantly  
10       inflates the cost of SCR technology by about 50  
11       percent. We know pretty well what SCRs cost. And  
12       those costs are inflated.

13                The Fox testimony also includes a cost  
14       effectiveness analysis calculated for CURE which  
15       is patterned on the ABB and GoalLine analyses.  
16       And because of that, they again suffer from the  
17       same deficiencies that I've discussed.

18                Furthermore, there's some math errors in  
19       table 2 of the testimony, but I would consider  
20       that to be a minor issue.

21                Q     There's a criticism, I believe,  
22       contained in Dr. Fox's testimony with regard to  
23       use of a present value calculation that was  
24       contained in the Elk Hills BACT analysis. Could  
25       you please comment on that?

1           A     Yeah, she states that the Elk Hills cost  
2           effectiveness calculation was based on a present  
3           value basis. And that it did not utilize the  
4           equivalent uniform annual cash flow, which is  
5           prescribed by EPA in the OAQPS control cost  
6           manual.

7                     Well, this is incorrect. In fact, what  
8           we did is we had an annual stream of payments. We  
9           brought them back on a net present value basis.  
10          And then we annually uniformed those back out,  
11          which is precisely what the OAQPS manual provides  
12          for. So the statement is incorrect and the costs  
13          were calculated with that, utilizing that method.

14          Q     Did you also review David Marcus'  
15          testimony submitted on behalf of CURE?

16          A     Yes. Marcus' testimony states that the  
17          end of the period effects are not accounted for in  
18          our BACT analysis.

19                     The period that was used to evaluate the  
20          BACT cost effectiveness was a ten-year period,  
21          which is what is prescribed by San Joaquin Valley  
22          APCD BACT guidelines, as is the discount rate.

23                     There are no economic adjustments that  
24          are necessary given that guidance.

25          Q     Thank you. Does that conclude your

1 testimony?

2 A I believe it does.

3 Q Thank you.

4 MR. MILLER: You'll need to change seats  
5 here.

6 PRESIDING MEMBER MOORE: Mr. Champion  
7 was previously sworn?

8 MR. MILLER: Yes, he was.

9 DIRECT EXAMINATION

10 BY MR. MILLER:

11 Q Mr. Champion, would you please state  
12 your name and occupation for the record?

13 A My name is Dennis Champion, and I'm the  
14 Project Permitting Manager for the Elk Hills  
15 Power; and also I'm employed by Occidental of Elk  
16 Hills, Manager of the Air Quality Program.

17 Q And your professional background that  
18 might be relevant with regard to the air quality  
19 topics you're going to be addressing?

20 A I have a bachelors of science degree in  
21 chemical engineering; I'm also a registered  
22 chemical engineer in California.

23 I have approximately 14 years of  
24 experience in air quality related issues including  
25 two and a half years at Kern County Air Pollution

1 Control District. And 12 years managing air  
2 quality program at Elk Hills.

3 Q And are you a member of professional  
4 societies that are related to those occupational  
5 pursuits?

6 A I'm a full member of AICHE; I'm also a  
7 member of AWMA and SPE, the Society of Petroleum  
8 Engineers.

9 Q And just for the record, AICHE stands  
10 for?

11 A American Institute of Chemical  
12 Engineers.

13 Q And the AWMA?

14 A That's the Air and Waste Management  
15 Association.

16 Q Thank you. Please explain the purposes  
17 of your testimony.

18 A I'd like to discuss project emission  
19 sources and emission controls, emission reduction  
20 credits, compliance of the Elk Hills Project with  
21 applicable air quality LORS, laws, ordinances,  
22 regulations and standards, as well as a couple  
23 mitigation measures.

24 Q All right. Are you sponsoring any  
25 portions of the application for certification for

1 the Elk Hills Power Project?

2 A Yes, I am, along with Joe Rowley,  
3 Alberto Abreu and Steve Radis, I'm sponsoring  
4 section 5.2 air quality; appendix K3, construction  
5 emission calculations; appendix K11, total project  
6 emission calculations for offset analysis;  
7 appendix K12, compliance analysis; as well as  
8 appendix K13, air emission offset sources.

9 Q Are you sponsoring any portions of other  
10 exhibits regarding air quality?

11 A Yes, I'm also sponsoring exhibit 2A and  
12 2C, responses to staff data requests 2 and 8, and  
13 responses to staff data requests 93 and 94, all  
14 regarding air quality.

15 Q Are you sponsoring further testimony in  
16 this proceeding?

17 A Yes, I am.

18 Q And would you identify it, please?

19 A It's entitled attachment A, testimony of  
20 Dennis Champion regarding air quality in support  
21 of the application for certification of Elk Hills  
22 Power Project.

23 Q Do you adopt the testimony included in  
24 attachment A, and as referenced in those portions  
25 of the exhibits you've identified as your true and

1 sworn testimony in this proceeding?

2 A Yes, I do.

3 Q Do you have any corrections to make to  
4 the portions of the exhibits that you're  
5 sponsoring?

6 A No.

7 Q And do you adopt the testimony included  
8 in attachment A and those portions of the exhibits  
9 identified above as your true and sworn testimony  
10 in this proceeding -- I think I already said that.

11 A Yes, I do.

12 Q Say it again, sorry. Could you please  
13 summarize your testimony?

14 A The project's going to entail  
15 construction emissions, of course; and those will  
16 come in two categories. We'll have heavy  
17 equipment emissions and fugitive dust emissions  
18 associated with the construction activities.

19 For the exhaust from the heavy  
20 equipment, in order to estimate those emissions,  
21 an estimate, we used emission factors from EPA and  
22 South Coast Air Quality Management District. We  
23 utilized those emission factors along with  
24 estimated use rates for the equipment to determine  
25 worst case hourly and annual emissions for the

1 project.

2           During our investigation of these  
3 equipments, we also determined that the use of  
4 ignition timing retard on diesel-fired equipment  
5 as a possible control technique suitable for this  
6 type of equipment, capable of achieving  
7 approximately a 40 percent reduction in NOx  
8 emissions in given circumstances.

9           However, it doesn't apply to all  
10 equipment, so what we did was assumed a 25 percent  
11 reduction in NOx across the entire fleet during  
12 construction.

13           We also reviewed and have gone over  
14 previously the use of exhaust filters on the heavy  
15 duty equipment. I believe that's contained in  
16 AQC-2.

17           Q     And while we're on that subject, do you  
18 have any concerns with that condition that you  
19 just referenced?

20           A     The condition is based on the review of  
21 a registered mechanical engineer in the State of  
22 California, taking a look at the operating  
23 characteristics and operating scenarios for a  
24 given piece of equipment. And determining the  
25 effectiveness of an exhaust control, an add-on

1 control device.

2 The idea here is that the registered  
3 mechanical engineer would have experience in  
4 rotating equipment or diesel-fired equipment and  
5 be knowledgeable with the specific type of control  
6 device, and be best suited to make a determination  
7 as to the applicability and effectiveness of  
8 equipment.

9 Now only before it's installed, but  
10 after it's in operation, in determining whether or  
11 not it is effective, or is causing or creating  
12 problems with the equipment.

13 So, that's the long way of saying I  
14 agree with staff's certification requirement.

15 Q Thank you. Do you have any further  
16 testimony you'd like to provide with regard to  
17 construction emissions?

18 A The other phase of construction  
19 emissions, of course, is fugitive dust. Again, we  
20 utilized EPA emission factors to estimate the  
21 quantity of fugitive dust that would be generated  
22 from our activities.

23 We made some very conservative estimates  
24 from that point, assuming that the dust would  
25 include 60 percent PM10.

1           We also determined that we would use a  
2           water spray technique to control the fugitive  
3           emissions, and also assumed that that would  
4           provide us with a 50 percent reduction in the  
5           emissions of fugitive dust.

6           And that is, of course, in compliance  
7           with regulation 8 requirements from the San  
8           Joaquin Valley Unified Air Pollution Control  
9           District.

10          Q     And would you like to summarize the  
11          information with regard to emission reduction  
12          credits?

13          A     Yes, I would. Of course, EHP has  
14          utilized emission reduction credits for all  
15          nonattainment pollutants pursuant to the NSR  
16          requirements in the Valley, San Joaquin Valley  
17          Unified APCD. I think I'll just call them APCD  
18          from now on.

19          The ERCs that were utilized by -- excuse  
20          me, the ERC documents were utilized by the APCD in  
21          attainment planning strategies and methodologies,  
22          and they're included, the deposit of these ERC  
23          emissions as future growth in their attainment  
24          planning documents.

25          What that means is that the district

1 recognizes the fact that these reductions occur.  
2 And they're also going to make allowance for them  
3 to occur in the future.

4           However, there's some stipulations  
5 associated with that. First of all, ERCs are  
6 generated according to the trading policy, the EPA  
7 trading policy. The state has the right to  
8 determine whether they're RACT-adjusted at the  
9 time of issuance, or RACT-adjusted at the time of  
10 use.

11           The State of California generally has  
12 decided that they're going to RACT-adjust at the  
13 time of issuance. In this case, these documents  
14 were RACT-adjusted at the time of issuance. That  
15 generated approximately 50 percent reduction in  
16 the overall value of the ERCs.

17           Q     I'm going to interrupt just for a second  
18 and ask for you to explain the acronym RACT  
19 adjusted.

20           A     RACT adjusted means reasonably available  
21 control technology. It's included in the  
22 requirements for an attainment demonstration.

23           Q     Thank you. Please continue.

24           A     Okay. When the documents were issued,  
25 again they were RACT-adjusted, which was

1 approximately a 50 percent reduction in overall  
2 value. And I'll give you an example so you can  
3 keep track of this.

4 Assume we had 100 pounds to start with.  
5 We now have 50 pounds, because of the RACT  
6 adjustment. Ten percent of those documents are  
7 also deposited into a community bank for community  
8 use. So now out of 100 pounds of possible  
9 reductions, we have left 40.

10 So these are deposited as future growth  
11 to allow for expansion of industrial activities in  
12 the future.

13 When those ERC documents are called upon  
14 for use in the future, as is the case here,  
15 there's an additional penalty associated with  
16 their use. A 20 percent of total project  
17 emissions. It's apples and oranges, but you can  
18 see there's another amount of ERCs that are again  
19 taken out of the bank and will not be available  
20 for future growth.

21 So, in essence the ERC program, the way  
22 it's set up, is to systematically reduce the  
23 amount of emissions that will be available for  
24 future use. And what this does is allows the  
25 district to utilize those documents as future

1 growth.

2 I guess I'd like to add one thing. I  
3 think the EPA, the San Joaquin Valley -- excuse  
4 me, the APCD and industry have a memorandum of  
5 understanding in place that recognizes the fact  
6 that the banking program in the San Joaquin Valley  
7 is adequate and sufficient for the future growth  
8 activities. And since these documents were  
9 included as future growth, they fall into and  
10 under the purveyance of that MOU, and are good.

11 One final issue regarding emission  
12 reduction credits. In order to permit the project  
13 under the APCD regulations, excess emission  
14 reductions are required. I've already discussed  
15 that.

16 In addition, we used what's known as  
17 inter-pollutant trading. What we did was used NOx  
18 emission reduction credits to offset the emissions  
19 of PM10.

20 There are studies conducted, I believe  
21 they were in the La Paloma case where they were  
22 first entered, that documented a NOx for PM  
23 trading rate, which in that case and this case,  
24 was 2.42 pounds of NOx for each pound of PM.

25 And the reason I bring that up because

1 that's a significant excess in the amount of  
2 reductions required for the project.

3 So what the point is, not only does the  
4 district systematically reduce the volume of  
5 emissions available, we've also provided excess  
6 emission reductions to assist in that, as well.

7 Q By virtue of the inter-pollutant trading  
8 ratio that was selected?

9 A Correct.

10 Q Have you reviewed Dr. Fox's testimony?

11 A Yes, I have.

12 Q And within that testimony have you  
13 reviewed sections you're dealing with, what the  
14 appropriate BACT level should be, that is to say  
15 the emission limit?

16 A Well, I have. It's interesting, Ms. Fox  
17 states that based on some test data that she  
18 garnered, in one case three quarters of data, in  
19 another case four quarters of data. Both of them,  
20 I think it was 37 percent and 52 percent complete,  
21 as far as records. At least from what I could  
22 gather from her testimony.

23 In any case, the imposition of BACT  
24 would require a six-month demonstration of  
25 continuous operation. I think the regulations are

1 fairly straightforward. They want continuous  
2 operation. They don't want piecemeal, put-  
3 together, fixed-up data; they want six months of  
4 solid operational data.

5 So the fact that we have some emission-  
6 related data that suggests emission limits of 1.3,  
7 for instance, on a one-hour basis, is interesting,  
8 and provides us with some evidence that we have a  
9 ways to go in the future.

10 But based on what I could gather the  
11 data set's incomplete. And, of course, I never  
12 did get the attachments to your testimony, so I  
13 could never really review the River Road facility.

14 But since it's apparently not six months  
15 of complete data, continuous data, it therefore is  
16 not complete, and BACT demonstrated in practice  
17 level could not be determined from that point.

18 Q Would it typically be the case, in your  
19 experience, not only with your present occupation,  
20 but previous experience with the Air Pollution  
21 Control District, to set the BACT level exactly at  
22 an average, monitored through a continuous  
23 emission monitoring system?

24 A It's been my experience with the  
25 regulatory agencies that they're very hesitant to

1 set an emission level at a performance level.

2 In other words, if I'm going to receive  
3 a guarantee from a manufacturer for an emission  
4 level, like was brought up earlier by Commissioner  
5 Moore, if the level is at 9, I'm going to  
6 guarantee that, I'm going to be fairly positive  
7 that my equipment can meet that limit.

8 The same thing with the air district,  
9 their obligation to the public at large is to  
10 insure compliance with the emission limits that  
11 are set forth.

12 And to set an emission limit based on  
13 performance data at the same level as performance  
14 data does not make any sense. Because it does not  
15 insure that unit could meet compliance standards  
16 100 percent of the time, which effectively is what  
17 the district is interested in. Not partial  
18 compliance requiring variances, which, in this  
19 case, under Title 5 they're not recognized  
20 officially, so.

21 Q And to your knowledge, EPA has not  
22 required a limit below 2 ppm over a three-hour  
23 period?

24 A No. They have not.

25 Q And to your knowledge there's no

1 guarantee available for less than 2 ppm?

2 A No, there is not.

3 Q Thank you. Do you have any further  
4 testimony concerning air quality?

5 A No, I do not.

6 Q Thank you.

7 MR. MILLER: I'm now going to move to  
8 Mr. Radis.

9 DIRECT EXAMINATION

10 BY MR. MILLER:

11 Q Mr. Radis, could you please state your  
12 name and occupation for the record?

13 A My name is Steve Radis and I'm a  
14 Principal of Global Environment and Risk  
15 Consulting at Arthur D. Little, Incorporated.

16 Q And you were previously sworn in this  
17 proceeding?

18 A Yes, I was.

19 Q Could you please summarize your  
20 experience as it relates to the air quality  
21 topics?

22 A I've had more than 20 years experience  
23 in preparation of environmental documents, and  
24 more specifically air quality modeling, air  
25 quality impact analyses, and general air quality

1 studies.

2 Q Thank you. And the purpose of your  
3 testimony today?

4 A Along with Alberto Abreu, Dennis  
5 Champion and Joe Rowley, we're here to describe  
6 potential air quality impacts associated with the  
7 proposed project.

8 Q Are you sponsoring any portions of the  
9 application for certification for Elk Hills?

10 A Yes, again with Alberto Abreu, Dennis  
11 Champion and Joe Rowley, I'm sponsoring sections  
12 5.2 of air quality, as well as appendices K1, 2,  
13 6, 7, 8 and 9, which deal with modeling protocol,  
14 meteorological data, building effects,  
15 construction modeling input and output files,  
16 operational modeling input and output files, and  
17 visibility calculations.

18 Q Thank you. Are you sponsoring any  
19 portions of other exhibits?

20 A Yes. Sponsoring exhibit 2A, responses  
21 to staff data requests numbers 2, 6 and 7; exhibit  
22 3, responses to CURE data requests 70 through 77;  
23 and appendix 1 to attachment A of my testimony.

24 Q Thank you. Do you have any corrections  
25 to make to the portions of the exhibits that

1       you're sponsoring?

2             A     No, I don't.

3             Q     And do you adopt the testimony included  
4       above and those portions of the exhibits  
5       identified above as your true and sworn testimony  
6       in this proceeding?

7             A     Yes, I do.

8             Q     Are you sponsoring any further  
9       testimony?

10            A     Attachment A.

11            Q     Thank you. And you adopt that, as well,  
12       as your true and sworn testimony in this  
13       proceeding?

14            A     Yes, I do.

15            Q     Could you summarize your testimony,  
16       please?

17            A     Yeah, I'll be brief since I think we've  
18       heard most of it already this morning.

19                    I was responsible for evaluating  
20       potential air quality impacts associated with  
21       construction and operational emissions.

22                    We modeled, using EPA protocol, both  
23       fugitive dust emissions from construction,  
24       combustion emissions from construction equipment,  
25       as well as about a dozen operational scenarios for

1 the proposed turbine project, including the worst  
2 case scenario, which involved start up of both  
3 units, as well as running a diesel-powered  
4 internal combustion engine.

5 Q And what were your conclusions?

6 A We found that for both construction and  
7 operational impacts, none of the standards would  
8 be violated, impacts would be considered  
9 insignificant.

10 Q Thank you. Have you reviewed the  
11 testimony presented by Dr. Fox?

12 A Yes, I have.

13 Q And could you comment on the portion of  
14 that testimony which relates to emissions of  
15 ammonia causing secondary PM10 formation?

16 A Yeah, there's actually two points that  
17 are brought up related to the analysis of SCR and  
18 SCONox, and the formation of secondary PM10 for  
19 particulate in the atmosphere.

20 In Ms. Fox's testimony she states that  
21 SCONox would eliminate ammonia impacts, and  
22 specifically the formation of secondary aerosol  
23 particulate matter, which results from reactions  
24 in the atmosphere of oxides of sulfur, as well as  
25 oxides of nitrogen.

1                   Staff has already noted in their FSA  
2                   that the air basin in San Joaquin Valley are  
3                   considered ammonia rich, ammonia being one of the  
4                   thicker compounds in the atmosphere, although not  
5                   the only compound that reacts with sulfur nitrogen  
6                   to form secondary particulate matter.

7                   While they state that there are no  
8                   ammonia sources immediately adjacent to the Elk  
9                   Hills facility, they are very close to large  
10                  emissions of ammonia used in agriculture in the  
11                  Valley, within the same air mass. And it should  
12                  be pointed out that there is a cogeneration  
13                  facility across the street from the proposed site,  
14                  which is currently utilizing ammonia, and also  
15                  would be emitting ammonia.

16                  In addition, the fact that there might  
17                  not be enough ammonia does not necessarily  
18                  preclude the formation of secondary particulates.  
19                  There are other reactions that occur in the  
20                  atmosphere. The CURE testimony cites three  
21                  reactions. There are probably dozens, if not  
22                  hundreds, of chemical reactions that occur in the  
23                  formation of secondary particulate from nitrogen  
24                  and sulfur emissions.

25                  So, even under conditions where there

1 might not be an abundance of ammonia, there  
2 probably would be formation of secondary  
3 particulate.

4 Typically what that would involve would  
5 be differences in the reaction rates in the  
6 formation of secondary particulate. But  
7 eventually you would end up with the same amount  
8 of secondary particulate matter from the sulfur  
9 and nitrogen emissions.

10 In addition, it's stated that the --

11 Q I'm going to interrupt you. When you  
12 say same amount, you mean same amount with SCONOx  
13 or SCR, either way?

14 A Right. The difference in secondary  
15 particulate between SCONOx and SCR would be really  
16 insignificant. They would be generally about the  
17 same.

18 The formation of secondary particulate  
19 is really driven by the emissions of sulfur  
20 dioxide or sulfur oxides, as well as nitrogen  
21 oxides.

22 It's also stated that there would be  
23 direct emissions of PM10 from the SCR unit related  
24 to ammonia slip. Really, both units, SCONOx and  
25 SCR, would result in emissions of secondary

1 particulate. In the case of SCONox you'd probably  
2 have sulfur dioxide initially emitted, which is a  
3 precursor to secondary PM10 formation. With SCR  
4 you would also have sulfur trioxide.

5 In either case you would have the same  
6 amount of sulfur, and would end up with roughly  
7 the same amount of secondary particulate  
8 formation.

9 Again, it might take a different amount  
10 of time for those reactions to occur, but you  
11 would end up with the same mass of aerosol in the  
12 atmosphere.

13 Q Thank you. Do you have any further  
14 testimony to provide concerning the modeling or  
15 other aspects that you were covering in your  
16 portion of the air quality testimony?

17 A I did want to comment on a statement  
18 about SCONox avoiding impacts associated with  
19 ammonia.

20 That is true in terms of ammonia  
21 hazards, although previous testimony for  
22 transportation and hazardous materials, staff has  
23 already concluded that those hazards would be  
24 insignificant. And essentially the SCONox would  
25 not offer any additional benefit from an

1 environmental standpoint by avoiding the use of  
2 ammonia.

3 In addition, ammonia is already used at  
4 the site in the adjacent cogeneration facility,  
5 and those hazards would not change.

6 Q And that was a matter, of course, that  
7 was previously dealt with at another hearing --

8 A Yes.

9 Q -- on hazardous materials?

10 A Right.

11 Q Does that conclude your testimony?

12 A Yes, it does.

13 Q Thank you.

14 MR. MILLER: The air quality panel is  
15 available for cross-examination.

16 PRESIDING MEMBER MOORE: Thank you.

17 With that, I believe that we're just going to take  
18 a short break, take ten minutes and come back.

19 We'll give the court reporter a break and all of  
20 us.

21 (Brief recess.)

22 PRESIDING MEMBER MOORE: Welcome back  
23 from our short break. For the benefit of the  
24 record, let me say we've been on a short break.  
25 We'll now reconvene to take the next step in the

1 evidentiary hearings.

2 The applicant has finished their panel  
3 presentation on air quality. I'm going to turn to  
4 staff and ask if they have any questions. Then  
5 I'm going to turn to the intervenors. And then we  
6 are going to move back to staff's presentation.

7 So, staff, do you have any questions?

8 MS. WILLIS: No, we do not.

9 PRESIDING MEMBER MOORE: No cross.

10 Thank you. Ms. Poole, I will turn to you and ask  
11 for your cross-examination.

12 MS. POOLE: Thank you. Okay, why don't  
13 I start with Mr. Abreu, since he's up there.

14 CROSS-EXAMINATION

15 BY MS. POOLE:

16 Q Mr. Abreu, is that the correct  
17 pronunciation?

18 MR. ABREU: Yes.

19 MS. POOLE: Have you ever visited a  
20 power plant equipped with SCONOx?

21 MR. ABREU: Yes, I have.

22 MS. POOLE: Which plant?

23 MR. ABREU: The Federal plant.

24 MS. POOLE: You stated that EPA Region 9  
25 has concluded that BACT for NOx is 2.5 ppm

1 averaged over one hour. EPA has lowered BACT  
2 levels in the past, correct?

3 MR. ABREU: Yes, they have.

4 MS. POOLE: In fact, BACT is constantly  
5 evolving as new technologies demonstrate the  
6 ability to meet lower emission limits, correct?

7 MR. ABREU: Yes.

8 MS. POOLE: You stated in your testimony  
9 that SCONOX, in your opinion, does not satisfy  
10 BACT for the reasons that Three Mountain provided  
11 in the letters appended to your testimony,  
12 correct?

13 MR. ABREU: Among other reasons, yes.

14 MS. POOLE: So, in contrast to what Ms.  
15 Luckhardt said earlier, you are, in fact, adopting  
16 comments of a direct competitor as your testimony,  
17 correct?

18 MR. MILLER: Is that a statement or a  
19 question?

20 PRESIDING MEMBER MOORE: Wait, Kate, I'm  
21 not sure I understand the question. Are you  
22 asking -- I didn't understand what you were  
23 asking.

24 MS. POOLE: Well, I'm asking if he's  
25 adopting the comments of Three Mountain as his

1 direct testimony.

2 MR. ABREU: No. It's an attachment to  
3 my testimony.

4 MS. POOLE: And you have sworn that the  
5 information in attachment A is true and correct,  
6 right?

7 MR. ABREU: True and correct insofar as  
8 that's the way it was provided to me, and the way  
9 it's included in my testimony, yes.

10 MS. POOLE: So, you are not attesting to  
11 the veracity of the information provided in the  
12 attachments to your testimony?

13 MR. ABREU: Those attachments are  
14 consistent with my own observations, and insofar  
15 as I did not prepare those documents, I can't say  
16 that I prepared them, but they are consistent with  
17 my own observations and my comments in my  
18 testimony.

19 MS. POOLE: I'm not asking you if you  
20 prepared them. I'm asking if you are testifying  
21 to the veracity of them.

22 MR. ABREU: I guess I'm not really sure  
23 what you're asking. The documents are true and  
24 accurate reproductions of the material that was  
25 presented by Three Mountain, included in my

1 testimony.

2 MS. POOLE: And is the content of the  
3 documents true and correct to the best of your  
4 knowledge?

5 MR. ABREU: To the best of my knowledge,  
6 it is, yes.

7 MS. POOLE: All right, so it is, in  
8 fact --

9 MR. MILLER: He's answered the question.

10 MS. POOLE: -- your testimony?

11 MR. ABREU: Pardon?

12 MS. POOLE: It is, in fact, your  
13 testimony?

14 MR. ABREU: It's an attachment to my  
15 testimony.

16 MR. MILLER: I think he's answered the  
17 question.

18 MS. POOLE: Do you agree with all of the  
19 reasons provided by Three Mountain in the  
20 attachments to your testimony?

21 MR. MILLER: Reasons provided? Could  
22 you explain what that means?

23 MS. POOLE: In his written testimony Mr.  
24 Abreu states that SCONOX does not satisfy BACT, in  
25 his opinion, for the reasons provided in the

1 attachments to his testimony.

2 I'm asking you if you agree with all of  
3 the reasons provided by Three Mountain in the  
4 attachments to your testimony.

5 MR. ABREU: I agree with what's provided  
6 in the Three Mountain documentation. Whether I  
7 agree with every single word in that document I  
8 really couldn't say. But I agree in general with  
9 what's in there, yes.

10 MS. POOLE: So you agree that SCONOx is  
11 not technically feasible for large combined cycle  
12 turbines?

13 MR. ABREU: Yes, I do.

14 MS. POOLE: EPA has already determined  
15 that SCONOx is both technically feasible and  
16 commercially available for large combined cycle  
17 projects, correct?

18 MR. ABREU: They have stated that. I  
19 disagree with that opinion. BACT is determined on  
20 a case-by-case basis. When you look at the  
21 specifics of this case and you analyze the  
22 technological issues associated with NOx with  
23 respect to this particular case, SCONOx is not  
24 technically feasible within a definition of BACT,  
25 for this project.

1 MS. POOLE: So you disagree with EPA on  
2 these issues?

3 MR. ABREU: Yes, I do.

4 MS. POOLE: Are you aware of any  
5 monolithic catalyst that has failed to scale up?

6 MR. ABREU: That's not my area of  
7 expertise. I couldn't tell you one way or the  
8 other.

9 MS. POOLE: But you're not aware of any?

10 MR. ABREU: Insofar as I'm not an expert  
11 in that area, no, I'm not aware of any.

12 MS. POOLE: You state in your testimony  
13 a conclusion that SCONOx has been demonstrated in  
14 practice cannot validly be drawn. EPA Region 9  
15 has already concluded that SCONOx is demonstrated  
16 in practice, correct?

17 MR. ABREU: That's what they have  
18 stated, I believe I mentioned that. You asked  
19 that question. Yes.

20 MS. POOLE: No, I'm asking a slightly  
21 different question now. I'm talking about  
22 demonstrated in practice. EPA has determined --  
23 EPA Region 9 has determined that SCONOx is  
24 demonstrated in practice, correct?

25 MR. MILLER: Can I ask a clarification.

1 Do you mean for this project?

2 MS. POOLE: I'm asking whether EPA  
3 Region 9 has concluded that SCONOx has  
4 demonstrated in practice. I'm not aware that they  
5 make these determinations on a project-by-project  
6 basis.

7 MR. MILLER: So, it's not related  
8 specifically to this project that you're asking  
9 the question?

10 MS. POOLE: I'm asking in general.

11 MR. ABREU: They have made that  
12 determination for a small, 25 megawatt machine and  
13 a 5 megawatt machine.

14 MS. POOLE: Would you turn to, I believe  
15 it's attachment C to your testimony, appendix C.  
16 I'm sorry, that's not correct.

17 (Pause.)

18 MS. POOLE: If you'll give me just a  
19 moment, I'm trying to find where this is in your  
20 testimony.

21 (Pause.)

22 MS. POOLE: The February 10, 2000 letter  
23 from EPA to Dennis Champion, which is attached to  
24 your testimony. I can't put my fingers on it at  
25 the moment.

1                   That letter states that SCONOx has been  
2 demonstrated to achieve 2.0 ppm NOx averaged over  
3 three hours, correct?

4                   MR. MILLER: It might help if you  
5 pointed out the -- I guess you don't have the  
6 document.

7                   MS. POOLE: I have the document. I  
8 don't know where it's attached to in Mr. Abreu's  
9 testimony, but it is attached to it.

10                  MR. ABREU: Yeah, I'm not -- I thought  
11 maybe within the letter you could point out where  
12 that statement is set forth. It might help.

13                  MS. POOLE: Do you have the letter in  
14 front of you?

15                  MR. ABREU: Yes, I do.

16                  MS. POOLE: The bottom of the second  
17 full paragraph on the first page.

18                  MR. ABREU: Yes.

19                  MS. POOLE: Does EPA state there that  
20 SCONOx has been demonstrated to achieve 2 ppm NOx  
21 averaged over three hours?

22                  MR. ABREU: Yes, that is a quote from  
23 the letter, yes.

24                  MS. POOLE: And does EPA then state that  
25 your analysis, meaning Elk Hills, eliminated the

1       SCONox technology mainly because it was assumed it  
2       had not yet been demonstrated in practice on large  
3       combustion turbines?

4               MR. ABREU:  Yes, it does say that.

5               MS. POOLE:  And does Region 9 then  
6       require a BACT analysis because it has considered  
7       the SCONox technology to have been demonstrated in  
8       practice since March 1998?

9               MR. ABREU:  Yeah, it says it's been  
10       demonstrated in practice based on six months of  
11       testing and monitoring data from Sunlaw's Federal  
12       Cogen plant in Vernon.  And then it goes on to  
13       add -- I'll just leave it at that.

14               I'd also like to add that they also talk  
15       about our proposed 2.5 ppm average over three  
16       hours.  They state, "In recent BACT determinations  
17       for several other permitted and proposed power  
18       projects in our region we have required this limit  
19       averaged over one hour."

20               So they also state that 2.5 at one hour  
21       constitutes BACT.

22               MS. POOLE:  And as you just responded,  
23       BACT is constantly evolving, correct?

24               MR. ABREU:  Sure.

25               MS. POOLE:  And EPA has not made any

1 determination on this project for the draft PSD  
2 permit?

3 MR. ABREU: No, they have not.

4 MS. POOLE: Thank you. Three Mountain,  
5 in an attachment to your testimony, states that  
6 SCONOX cannot be considered available until  
7 demonstrated in practice at the conclusion of the  
8 proposed three-year demonstration period for the  
9 Otay Mesa Generating Project.

10 Is that your position?

11 MR. ABREU: Could you tell me --

12 MR. MILLER: Could you give us a page  
13 reference?

14 MS. POOLE: That's in attachment B at  
15 page 7. I'm simply asking you if you're agreeing  
16 with the statement.

17 MR. ABREU: Yeah, I'd like to read it  
18 before I respond to you.

19 MS. POOLE: It's page 7 of the  
20 attachment to the letter.

21 MR. ABREU: Right. Could you point me  
22 to a paragraph?

23 MS. POOLE: Well, I can't find it at the  
24 moment.

25 MR. ABREU: I believe I've found it.

1 The sentence reads, "Given that Otay is behind  
2 Three Mountain in the permitting process it is  
3 clear that SCONOx is not currently commercially  
4 available and cannot be considered available until  
5 demonstrated in practice at the conclusion of the  
6 proposed three-year demonstration period for the  
7 Otay Mesa Generating Project."

8 Is that what you were referring to?

9 MS. POOLE: Yes.

10 HEARING OFFICER WILLIAMS: What page are  
11 you reading from?

12 MR. ABREU: Page 7, first full paragraph  
13 at the top, second sentence.

14 The question was whether I agree with  
15 that?

16 MS. POOLE: Yes.

17 MR. ABREU: I think it's a reasonable  
18 position, yes.

19 MS. POOLE: On page 6 of your testimony  
20 you state that it would be counter-productive to  
21 require the installation of SCONOx on any projects  
22 besides Otay Mesa and Nueva Azalea. Do you see  
23 that?

24 MR. ABREU: In addition to those  
25 projects it would be counter-productive, I

1 believe, is what the correct --

2 MS. POOLE: Do you believe that it would  
3 be counter-productive to limit the amount of air  
4 pollution that's emitted from the Elk Hills  
5 Project to as little as possible?

6 MR. ABREU: Provided it satisfies the  
7 best available control technology provisions,  
8 that's what the emissions from the project will be  
9 limited at. And SCNOx and SCR currently have the  
10 same emission rate.

11 MS. POOLE: That's not my question, Mr.  
12 Abreu. Do you believe that it would be counter-  
13 productive to limit the amount of air pollution  
14 that's emitted from this project to as little as  
15 possible?

16 MR. ABREU: I believe I answered the  
17 question.

18 MS. POOLE: No, I don't believe you did.  
19 It's a yes or no question.

20 MR. ABREU: Oh, I don't believe --

21 MS. POOLE: Do you believe --

22 MR. ABREU: -- it is a yes or no  
23 question. The answer is, provided that the  
24 emission limitations from the project are limited  
25 pursuant to federal and state law, as defined by,

1 among other things, the best available control  
2 technology determination, then the emissions from  
3 the power plant should be limited to those levels.

4 In theory would it be good to limit  
5 emissions from a power plant to zero? Yes.

6 MS. POOLE: Thank you.

7 MR. ABREU: But that's not a practical  
8 consideration --

9 MS. POOLE: Do you believe it would be  
10 counter-productive to eliminate any risk that the  
11 public might be exposed to anhydrous ammonia?

12 MR. MILLER: Objection. We've already  
13 had a hearing on anhydrous ammonia. It went on  
14 all day. I think that we've covered it.

15 PRESIDING MEMBER MOORE: Yeah, I'll  
16 sustain the objection.

17 MS. POOLE: Have you asked ABB or  
18 GoalLine what guarantee it would provide for the  
19 Elk Hills Project?

20 MR. ABREU: People in our company have,  
21 yes. Not me, personally.

22 MS. POOLE: Has your company or you  
23 requested a firm price for SCONOX from ABB?

24 MR. ABREU: We have -- well, people in  
25 our office met with ABB and among the things that

1 was requested for information from ABB was some  
2 additional warranty information, yes.

3 MS. POOLE: Have you requested a firm  
4 price for SCONOX from ABB?

5 MR. ABREU: In writing, I believe we  
6 have not, no. We have reviewed the proposal that  
7 they submitted to Three Mountain.

8 MS. POOLE: Your project has an  
9 uncontrolled 9 ppm CO outlet in baseload  
10 operations, correct?

11 MR. ABREU: Yes.

12 MS. POOLE: Can you buy a CO oxidation  
13 catalyst that is guaranteed for 90 percent CO  
14 removal?

15 MR. ABREU: For 90 percent removal? I  
16 don't know, unless you bid it you wouldn't be able  
17 to tell.

18 MS. POOLE: So you haven't bid that?

19 MR. ABREU: We haven't bid this for this  
20 project, no.

21 MS. POOLE: What level of NOx emissions  
22 has your pollution control technology vendor  
23 guaranteed?

24 MR. ABREU: We have not gone out for  
25 vendor guarantees for NOx.

1 Joe Rowley would like to add some  
2 clarification.

3 MR. ROWLEY: We went out to bid for an  
4 EPC contract, not for specific equipment, but for  
5 the overall project. And in that EPC bid  
6 specification we included the anticipated permit  
7 requirement of 2.5 ppm one hour average. And  
8 there was, to my knowledge, no exception taken to  
9 that.

10 MS. POOLE: Have you asked your EPC  
11 contractor if they could meet a lower NOx limit?

12 MR. ROWLEY: As the 2.5, one-hour  
13 average represents the BACT determination, we  
14 anticipate, and what in fact EPA has stated in  
15 some of their letters, there was no reason to do  
16 that.

17 MS. POOLE: So you haven't asked?

18 MR. ROWLEY: We did not.

19 MS. POOLE: Thank you. How many hours  
20 of operation does SCR have on Frame 7F's at 2 ppm  
21 NOx, averaged over three hours? In merchant mode.

22 MR. ROWLEY: There is at least one  
23 merchant power plant operating at 3.5 ppm, and we  
24 are familiar enough with that operation to where  
25 we're confident that we can go to 2.5.

1 MS. POOLE: So you're not aware of any  
2 merchant power plant using SCR, equivalent size to  
3 this project, that's meeting 2.5 ppm NOx over one  
4 hour or two over three hours?

5 MR. ABREU: I'm not aware of any.

6 MR. ROWLEY: No, I'm not, either.

7 MS. POOLE: Would Elk Hills be willing  
8 to accept an annual NOx limit of 100 tons per  
9 year?

10 MR. ROWLEY: No. We are acquiring ERCs  
11 to completely offset the project, and then some,  
12 as described by Mr. Champion.

13 MS. POOLE: Are you aware that Otay Mesa  
14 has proposed an annual NOx limit of 100 tons per  
15 year using SCONOx?

16 MR. ROWLEY: I'm not surprised at that,  
17 given the fact that ERCs are not available in the  
18 San Diego area.

19 MS. POOLE: Mr. Abreu, you stated that  
20 BACT is the most stringent emission limitation,  
21 correct?

22 MR. ABREU: Determined on a case-by-case  
23 basis, taking into account energy, environmental,  
24 and other costs.

25 MS. POOLE: I believe you also addressed

1       some items about how frequently the catalyst would  
2       need to be replaced for SCONOx. Have you asked  
3       ABB or GoalLine how often the catalyst needs to be  
4       replaced?

5               MR. ABREU: People in our office have  
6       asked that question.

7               MS. POOLE: And what response did they  
8       get?

9               MR. ABREU: The response we were told  
10       verbally was that it would have a three-year  
11       warranty, and that's --

12              MS. POOLE: I'm not asking you about the  
13       warranty. I'm asking you how often the catalyst  
14       would need to be replaced.

15              MR. ABREU: Replacement is consistent  
16       with the warranty. It's a three-year warranty.  
17       You presume that that's the --

18              MS. POOLE: I understand --

19              MR. ABREU: -- useful life of the  
20       catalyst --

21              MS. POOLE: -- that that's your  
22       position. Have you asked ABB or GoalLine how  
23       often the catalyst needs to be replaced, you or  
24       somebody in your company?

25              MR. ABREU: I believe we have and I

1 believe that I've answered with what we've been  
2 responded to that question with it's a three-year  
3 warranty.

4 If you're asking me if the SCONOX  
5 catalyst will last longer than that, --

6 MS. POOLE: That's not what I'm asking  
7 you.

8 MR. ABREU: -- we haven't asked that  
9 question.

10 MS. POOLE: You submitted your SCONOX  
11 BACT analysis to EPA, correct?

12 MR. ABREU: Yes, Dennis Champion  
13 submitted that.

14 MS. POOLE: So, EPA's guidance on BACT  
15 analyses and not the San Joaquin Valley Unified  
16 Air Pollution Control District's is the  
17 appropriate guidance to use, correct?

18 MR. MILLER: It's a conclusion of law  
19 that I don't think is appropriate to ask this  
20 witness to make.

21 MS. POOLE: This witness already  
22 addressed the fact that certain items in their  
23 BACT analysis were consistent with the San Joaquin  
24 Valley BACT analysis. This question goes to  
25 whether that's the appropriate standard.

1 HEARING OFFICER WILLIAMS: If he can, I  
2 think it's appropriate for him to answer.

3 MR. ABREU: The San Joaquin Valley's  
4 rules and regulations are contained in the SIP,  
5 and as such, they're accepted by EPA and  
6 enforceable by EPA.

7 Insofar as the BACT analysis complies  
8 with both the federal definition and the SIP  
9 included definitions of San Joaquin Valley, then  
10 the BACT analysis complies with both of those  
11 provisions.

12 MS. POOLE: So, you're stating that the  
13 BACT analysis that you performed complies with  
14 EPA's guidance in the OAQPS cost effectiveness  
15 manual?

16 MR. ABREU: Yes. Let me define what SIP  
17 means. It's a state implementation plan.

18 MS. POOLE: Excuse me, Mr. Abreu, --  
19 okay.

20 You stated that you had APCD experience,  
21 correct?

22 MR. ABREU: Yes.

23 MS. POOLE: Do you remember when SCR was  
24 not BACT?

25 MR. ABREU: I remember when SCR was --

1 when I was working with Kern County SCR was  
2 starting to be implemented as BACT. And, in fact,  
3 there were some machines in Japan that were  
4 achieving, I believe, a 9 ppm BACT emission level  
5 with SCR, and they were having some issues  
6 associated with that.

7 And there was a fair amount of  
8 investigation as to the possibility of using that  
9 technology and equipment in the United States.  
10 And that equipment eventually was transferred and  
11 included as BACT for gas turbines.

12 MS. POOLE: In that capacity, when you  
13 were at the APCD, do you recall any project  
14 proponents telling you that SCR would not work?

15 MR. ABREU: No, I can't say that that's  
16 the case. I remember everybody speaking of  
17 impacts of ammonia and things like that. And  
18 there was some concerns about operation, I guess,  
19 but I didn't believe those to be -- I don't  
20 believe that those were the main thrust of their  
21 arguments against BACT.

22 MS. POOLE: Did you agree with those  
23 arguments?

24 MR. ABREU: I believe we analyzed BACT  
25 and we analyzed the technology. And we believed

1 the technology could be used.

2 MS. POOLE: So you did not agree with  
3 the operational concerns and other concerns raised  
4 by the proponents?

5 MR. ABREU: Yeah, the issues associated  
6 with BACT at the times, and the ones associated  
7 with SCONOx today are quite different.

8 MS. POOLE: That's not what I'm asking  
9 you, Mr. Abreu. You did not agree with those  
10 proponents who claimed that SCR had operational  
11 problems and other problems?

12 MR. ABREU: No, I agreed that there were  
13 some problems. I believed those problems to be  
14 surmountable.

15 MR. ROWLEY: As I testified, the SCR  
16 technology went through a demonstration process.  
17 And by definition there was a period in history  
18 before SCR was demonstrated. And before SCR was  
19 demonstrated there was some trepidation about the  
20 technology.

21 Once it was demonstrated then those  
22 concerns evaporated.

23 MS. POOLE: Okay, let's go there, Mr.  
24 Rowley. What historical year was the first year  
25 you would have considered SCR to be reliable

1 enough and demonstrated enough to use in a large  
2 combined cycle unit?

3 MR. ROWLEY: It was in the late 1980s, I  
4 don't recall the specific year.

5 MS. POOLE: And I believe that Mr. Abreu  
6 just said that SCR was being considered BACT in  
7 the early '80s, is that correct?

8 MR. ABREU: That's not what I said. The  
9 BACT determinations that I made in Kern County  
10 were made in '86 or '87 timeframe.

11 MS. POOLE: When was the first BACT  
12 determination in California that required SCR --  
13 the emission limits of 2 by SCR as BACT?

14 MR. ABREU: I don't remember.

15 MS. POOLE: Mr. Rowley?

16 MR. ROWLEY: I don't recall.

17 MS. POOLE: Mr. Rowley, I believe you  
18 stated that SCONox operates at 600 to 700 degrees  
19 Fahrenheit in your testimony.

20 In fact, SCONox operates at 300 to 700  
21 degrees Fahrenheit, correct?

22 MR. ROWLEY: The SCONox system that ABB  
23 Alstom proposes, and as described in the Stone and  
24 Webster report, attached to Phyllis Fox's  
25 testimony, for the large scale gas turbines the

1 operation would be at 600 to 700 degrees, and also  
2 incorporating SCOSOx.

3 MS. POOLE: So you're stating that  
4 according to your interpretation that proposed  
5 system is not effective below 600 degrees?

6 MR. ROWLEY: I can quote from the  
7 report, if that would be helpful.

8 MS. POOLE: No, I don't think that would  
9 be helpful. I'm asking you what your opinion is.  
10 In your interpretation of that system, are you  
11 stating that SCONOx would not be effective at 600  
12 degrees?

13 MR. ROWLEY: I don't think there's any  
14 need to interpret something that's stated quite  
15 explicitly in the Stone and Webster report which  
16 was commissioned by ABB Alstom.

17 And in the report it states that for  
18 large gas turbines the system would operate at 600  
19 to 700 degrees incorporating SCOSOx.

20 MS. POOLE: And have you asked ABB or  
21 GoalLine whether a system for SCONOx could be  
22 designed to be effective at lower temperatures?

23 MR. ROWLEY: There is a 28 megawatt  
24 facility in operation at 300 degrees. The Stone  
25 and Webster report states that that technology is

1 geared towards retrofits rather than new  
2 installations.

3 And also there's no demonstration of  
4 SCOSOx in integration with that low temperature  
5 catalyst.

6 MS. POOLE: Okay, now let me ask you my  
7 question again. Perhaps you've forgotten it.

8 Have you asked ABB or GoalLine if SCONOx  
9 would be effective at lower temperatures, lower  
10 than 600 degrees?

11 MR. ROWLEY: There's no need to ask that  
12 question because it's stated explicitly in the  
13 Stone and Webster report that for retrofit  
14 applications that a 300 degree catalyst works.

15 MS. POOLE: Have you asked ABB or  
16 GoalLine whether 300 degree catalyst would work in  
17 a new application?

18 MR. ROWLEY: I have not asked that  
19 question.

20 MS. POOLE: Is ammonia combustible?

21 MR. ROWLEY: Ammonia is combustible, but  
22 not readily. Not, say, as hydrogen or natural gas  
23 is combustible.

24 MS. POOLE: Were the scale of tests  
25 which you talked about associated with SCR because

1 of ammonia distribution problems in the system?

2 MR. ROWLEY: Ammonia distribution was  
3 the main concern in scaling of the technology,  
4 getting uniform distribution.

5 Sort of analogous to the challenge of  
6 getting uniform distribution of a regeneration gas  
7 in a SCONOX technology. Although the resolution  
8 of that is much more difficult in the case of  
9 SCONOX than it was for SCR. Because SCR, the SCR  
10 ammonia injection grid is easily modified, whereas  
11 the distribution of regeneration gas in the SCONOX  
12 system involves complex mechanical contraption.

13 MS. POOLE: Mr. Abreu, in your BACT  
14 analysis you did not obtain quotes from ABB or  
15 GoalLine for the costs assumed in there, correct?

16 MR. ABREU: Directly, no. We obtained  
17 the -- no, we did not. Oh, let me rephrase -- let  
18 me go back to that.

19 We met with ABB, people in our office  
20 met with ABB before that BACT analysis was  
21 completed, and some of the costs reflected in that  
22 BACT analysis are based on that discussion, yes.

23 MS. POOLE: But you haven't asked ABB  
24 for a quote for the system, correct?

25 MR. ABREU: Again, we asked verbally

1 that they provide us additional information about  
2 SCONOX and warranty information, et cetera,  
3 performance information. And that was never  
4 provided to us.

5 MR. MILLER: This question was already  
6 asked, I believe. This line of questioning has  
7 already occurred.

8 HEARING OFFICER WILLIAMS: Is that an  
9 objection, counsel?

10 MS. POOLE: Okay.

11 MR. MILLER: Yes. Thank you for asking.

12 HEARING OFFICER WILLIAMS: What's the  
13 basis for the objection?

14 MR. MILLER: That the question's already  
15 been asked and answered.

16 HEARING OFFICER WILLIAMS: Overruled.

17 MR. MILLER: Thank you for your  
18 consideration.

19 MS. POOLE: Did you obtain cost  
20 information, a vendor quote from ABB or GoalLine  
21 for the cost information included in your BACT  
22 analysis?

23 MR. ABREU: Asked and answered --

24 MS. POOLE: That's been overruled, --

25 HEARING OFFICER WILLIAMS: Would you

1 please just answer the question.

2 MS. POOLE: -- Mr. Abreu.

3 MR. ABREU: Okay. We met with ABB. ABB  
4 gave use additional information on the cost of  
5 SCONOX and the systems. And we asked them to  
6 provide us with additional information for that,  
7 and they did not respond to that.

8 MS. POOLE: So you have not obtained a  
9 vendor quote for SCONOX on the Elk Hills project?

10 MR. ABREU: We have not received one  
11 from ABB.

12 MS. POOLE: Thank you. Is it your  
13 position that SCONOX will not work on Otay Mesa?

14 MR. ABREU: It is my position that given  
15 enough time and money they could make it work.

16 MR. ROWLEY: I think that's consistent  
17 with the demonstration of any new technology. If  
18 you're willing to throw enough time and money at  
19 something, you can make it work. That's not to  
20 say that the project would be financially  
21 successful or viable.

22 MR. ABREU: I think also that they will  
23 have compliance issues associated with that  
24 technology as they develop it.

25 MR. ROWLEY: We don't know that it's

1 going to work.

2 MS. POOLE: So is it your position that  
3 Otay Mesa will be financially inviable because of  
4 the use of SCONOX?

5 MR. ROWLEY: We don't know. I would  
6 hate to put myself in their shoes. We also don't  
7 know what the relationship is between ABB Alstom  
8 and the Otay project. We don't know what  
9 contractual relationships there may be there.  
10 Perhaps there's a funding of the demonstration. I  
11 don't know.

12 MS. POOLE: And you haven't pursued any  
13 contractual relationship with ABB for this  
14 project, right?

15 MR. ROWLEY: No, because our project is  
16 a merchant power plant. It is not a demonstration  
17 project.

18 MS. POOLE: Otay Mesa is also a merchant  
19 power plant, correct?

20 MR. ROWLEY: It is, in part, a  
21 demonstration project, according to their own  
22 words.

23 MS. POOLE: I have one quick question  
24 for Mr. Champion. Actually, a couple more than  
25 one, and a couple for Mr. Radis.

1                   Mr. Champion, I'm going to ask you a  
2                   question about an attachment to Dr. Fox's  
3                   testimony. Do you have that with you?

4                   MR. CHAMPION: Well, I have a bootleg  
5                   copy, since I never received my official copy.

6                   MS. POOLE: That was mailed to you. I  
7                   don't know why you didn't receive it.

8                   MR. CHAMPION: It was probably too  
9                   heavy. Yes, I have it.

10                  MS. POOLE: Could you turn to attachment  
11                  39 of the testimony, please. Do you have that in  
12                  front of you?

13                  MR. CHAMPION: Yes, ma'am.

14                  MS. POOLE: And that's the baseline  
15                  emissions inventory from the San Joaquin Valley  
16                  Unified Air Pollution Control District, correct?

17                  MR. CHAMPION: I haven't read it  
18                  completely.

19                  MS. POOLE: Does it look to you like its  
20                  the baseline emissions inventory for the San  
21                  Joaquin Valley Unified APCD?

22                  MR. CHAMPION: It's entitled, Chapter 2,  
23                  Emissions Inventory.

24                  MS. POOLE: Well, Mr. Champion, you  
25                  testified that the EICs for the project are

1 included in the baseline emissions inventory for  
2 the San Joaquin Valley, is this it?

3 MR. CHAMPION: As I recall I said that  
4 the emissions were included in their attainment  
5 planning documents as future growth.

6 MS. POOLE: Is this an attainment  
7 planning document for future growth?

8 MR. CHAMPION: It could be stated that  
9 way, yes.

10 MR. MILLER: May I ask a question? The  
11 date of this document, could you give us the date  
12 of this document, so we're sure we're dealing with  
13 something --

14 MS. POOLE: I believe it's 1996.  
15 There's a cite in Dr. Fox's testimony.

16 MR. MILLER: Could you direct us to Dr.  
17 Fox's testimony page where this is referenced?

18 MS. POOLE: If you need me to do that I  
19 can.

20 MR. MILLER: If you wouldn't mind.

21 (Pause.)

22 MS. POOLE: It's referenced in footnote  
23 54, page 45.

24 MR. MILLER: The purpose of this cross  
25 relates to what aspect of his direct?

1 MS. POOLE: On page 2 of Mr. Champion's  
2 testimony he states in the last full paragraph --  
3 I'm sorry, last not-full paragraph: The ERCs  
4 proposed by this project are contained as growth  
5 emissions in the most recent attainment  
6 demonstrations for the San Joaquin Valley, and  
7 thus are included in the baseline emissions  
8 inventory.

9 MR. MILLER: Thank you.

10 MS. POOLE: Mr. Champion, could you  
11 please show me where in this document ERC number  
12 S-0825-2 is included in the inventory?

13 MR. CHAMPION: These are the original  
14 issue numbers, and I don't have the cross-  
15 reference, and I apologize --

16 MS. POOLE: Actually it's cross-  
17 referenced in the FDOC. I'd be happy to give you  
18 some time to give you all of those old references  
19 so you can go through there if you'd like.

20 MR. CHAMPION: Excuse me, where are  
21 they, the cross-references?

22 MS. POOLE: In the final DOC.

23 (Pause.)

24 MR. CHAMPION: Sorry, do you have the  
25 page number offhand?

1 MS. POOLE: I don't, offhand. I'm  
2 looking for it.

3 MS. WILLIS: Mr. Hearing Officer, we do  
4 have air district representatives that might be  
5 able -- there's apparently some confusion in  
6 plans. There may be -- if the Committee would  
7 like to clear up that question.

8 MS. POOLE: Well, this Committee has --  
9 or this witness has testified to this, so I'd like  
10 to get this witness' response.

11 MS. WILLIS: You may not be getting a  
12 correct answer at this point because there's  
13 confusion in which plan you're looking at.

14 MR. CHAMPION: That's true. I believe  
15 what you're seeing here is post-1990 reductions,  
16 I'm guessing here. I think maybe the APCD who is  
17 here could answer that more thoroughly.

18 If that is the case, however, they do  
19 have allowances for pre-1990 emission reduction  
20 credits within this document.

21 MS. POOLE: Okay, on page 20 of the  
22 final DOC there is a history of the ERC number  
23 which I'm asking you about S-0825-2. Could you  
24 show me where any of these ERCs show up in the  
25 emissions inventory?

1           MR. CHAMPION: I'm sorry, I was looking  
2           in the FSA not the PDOC.

3           MR. MILLER: There seems to be some  
4           potential continuing confusion as to whether this  
5           plan is the correct one to be looking at.

6           MS. POOLE: Well, your witness has  
7           testified that these ERCs are included in the  
8           baseline emissions inventory.

9           MR. MILLER: For --

10          MS. POOLE: He should have a sense of  
11          what that emissions inventory is.

12          MR. MILLER: But there are two plans, as  
13          I understand it, and I'm just thinking there may  
14          be some communication that he is looking -- you've  
15          got him looking in the NOx plan, when it may be  
16          there's another plan, I believe it's the PM10  
17          plan, that might be appropriate.

18          HEARING OFFICER WILLIAMS: Well, perhaps  
19          we could move on and come back to this point.

20          MS. POOLE: Well, this is a NOx ERC, so  
21          it should be included in this plan.

22          MR. CHAMPION: Okay, if you recall we're  
23          going to use NOx as an interpollutant trade-off  
24          for PM10. And the District utilized, I believe  
25          the document that you're saying, this as a NOx

1 future growth, they used another document which is  
2 currently numbered 0825-2 as a PM future growth.

3 MS. POOLE: And it's your testimony that  
4 this particular ERC number S-0825-2 is included in  
5 that PM10 demonstration plan?

6 MR. CHAMPION: Let me look on page 20,  
7 okay?

8 MS. POOLE: Sure.

9 MR. CHAMPION: And you're looking for  
10 what number?

11 MS. POOLE: S-0825-2.

12 MR. CHAMPION: That document was  
13 included in the particulate matter reasonable for  
14 the progress plan.

15 MS. POOLE: And what's the date of that  
16 plan?

17 MR. CHAMPION: I think off the top of my  
18 head it was 1992 or 1996.

19 MS. POOLE: Okay, thank you. In your  
20 written testimony, Mr. Champion, do you recommend  
21 modification of proposed condition AQC2 to require  
22 injection timing retard?

23 MR. CHAMPION: I think we'd be willing  
24 to accept that modification, yes.

25 MS. POOLE: Well, in fact, you state it

1 should be required, correct?

2 MR. CHAMPION: I said we included that  
3 in our modeling efforts, and that it's a viable  
4 control technique. And we would be willing to  
5 accept that as a modification to AQC2.

6 MS. POOLE: I'm going to read to you  
7 from the second-to-last paragraph of your written  
8 testimony: In addition, ACQ2 should be modified  
9 to reflect the applicant's implementation of  
10 injection timing retard and high pressure  
11 injectors to reduce NOx emissions.

12 MR. CHAMPION: As I stated, it's a  
13 viable control technology and we're willing to  
14 accept that modification.

15 MS. POOLE: Well, in fact, you state in  
16 here that AQC2 should be modified to include that,  
17 correct?

18 MR. CHAMPION: Okay. Yes, that's what  
19 it says.

20 MS. POOLE: Thank you. No ERCs have  
21 been offered for the Elk Hills Project in excess  
22 of district rules and requirements, correct?>

23 MR. CHAMPION: With the exception of  
24 particulate matter at 2.42:1.

25 MS. POOLE: And that's in excess of a

1 district requirement?

2 MR. CHAMPION: The district requirement  
3 says that interpollutant trading is allowed and  
4 the offset ratio is determined on a case-by-case  
5 basis.

6 MS. POOLE: And was the offset ratio  
7 here of 2.42:1 determined by the district?

8 MR. CHAMPION: That is correct. There -  
9 -

10 MS. POOLE: So, no ERCs have been  
11 provided in excess of district rules and  
12 requirements, correct?

13 MR. CHAMPION: No, that is not correct.  
14 This is a case-by-case determination. The actual  
15 offset ratio determined by the document in  
16 question was 1:1. Both La Paloma and Elk Hills  
17 agreed to excess reductions to facilitate  
18 uncertainties.

19 MS. POOLE: And the district required  
20 the ratio of 2.42:1, correct?

21 MR. CHAMPION: 2.42:1, that's correct.

22 MS. POOLE: Thank you. Is it your  
23 position that a merchant plant which does not  
24 operate continuously cannot be the basis for a  
25 BACT determination?

1                   MR. CHAMPION: To meet the strict  
2 guidelines of federal requirements you need six  
3 months of continuous operation to demonstrate a  
4 practice.

5                   MS. POOLE: And where is that federal  
6 requirement?

7                   MR. CHAMPION: That was quoted out of  
8 Ms. Fox's testimony. I believe it's in NSR work  
9 manual.

10                  MS. POOLE: I don't believe it is. I  
11 believe that's a proposed rule that has not been  
12 implemented.

13                  Mr. Radis, is there --

14                  MR. CHAMPION: -- trade places.

15                  MS. POOLE: Is there a chance, however  
16 slim, that the ammonia used for this project might  
17 spill?

18                  MR. MILLER: Objection, this is going  
19 back to the --

20                  MS. POOLE: Mr. Radis --

21                  MR. MILLER: -- prior hearing --

22                  MS. POOLE: -- just testified about the  
23 fact that the ammonia associated with SCR would  
24 not cause any environmental impacts.

25                  MR. MILLER: He only testified as to a

1 prior finding in this proceeding, not in a new  
2 assertion raised.

3 PRESIDING MEMBER MOORE: I'm going to  
4 sustain.

5 MS. POOLE: You also made a comment, I  
6 believe, that the formation of secondary PM10  
7 would be approximately the same for SCR and  
8 SCONOx. What's the basis for that statement?

9 MR. RADIS: The formation of secondary  
10 PM10 is really driven by the emissions of nitrogen  
11 oxides and sulfur oxides. And that would be the  
12 same under either control technology, or very very  
13 similar.

14 MS. POOLE: Does the SCOSOx catalyst  
15 associated with SCONOx remove SOx emissions?

16 MR. RADIS: It's my understanding that  
17 the SCONOx catalyst temporarily absorbs the sulfur  
18 compounds, but upon regeneration emits those as  
19 sulfur dioxide.

20 MS. POOLE: I'm sorry, I asked about the  
21 SCOSOx catalyst.

22 MR. RADIS: Oh, the SCOSOx. I believe  
23 it does remove the sulfur compounds. However,  
24 when evaluating this project, sulfur emissions are  
25 a very small fraction of the total emissions of

1 both sulfur and nitrogen oxides, which were used  
2 to determine PM10 formation.

3 MR. ROWLEY: In fact, the SCOSOx  
4 catalyst, as stated, I think really there is just  
5 a misstatement as to whether it's SCONOx or  
6 SCOSOx. The SCOSOx catalyst absorbs SO2, and then  
7 upon regeneration the SO2 is re-emitted. And so  
8 there is no difference in SO2 emissions between  
9 SCONOx and SCR.

10 In order to avoid poisoning the SCONOx  
11 catalyst, the --

12 MS. POOLE: Could you excuse me just for  
13 a second, Mr. Rowley.

14 MR. ROWLEY: -- the SO2 is re-emitted at  
15 a location downstream of the SCONOx.

16 MS. POOLE: Could you repeat that? I  
17 missed it because I was talking.

18 MR. ROWLEY: I'll start from the top.  
19 The SCOSOx catalyst absorbs SO2 in order to  
20 mitigate the poisoning or deactivation of the  
21 SCONOx catalyst.

22 This happens just upstream of the SCONOx  
23 catalyst. Upon regeneration of the SCOSOx  
24 catalyst, the SO2 is re-emitted from the catalyst  
25 and it's, according to the concept proposed by

1 ABB, piped to a location downstream of the SCONOx  
2 catalyst and put back into the exhaust stream.

3 So the net emission of SO2 is the same,  
4 it's simply captured and then re-emitted  
5 downstream of the SCONOx catalyst.

6 MS. POOLE: And are you aware that a  
7 scrubber is used to remove SO2 as part of SCOSOx?

8 MR. ROWLEY: Not in the high temperature  
9 application ABB Alstom proposes for new  
10 installations.

11 MS. POOLE: Have you asked ABB Alstom if  
12 they would provide a sulfur -- excuse me, a  
13 scrubber with the SCOSOx catalyst for this  
14 project?

15 MR. ROWLEY: In the Stone-Webster  
16 document that I reviewed --

17 MS. POOLE: That's not what I'm asking  
18 you, Mr. Rowley. I'm asking you if you've asked  
19 ABB or GoalLine whether they would provide a  
20 scrubber with the SCOSOx catalyst for this  
21 project.

22 MR. ROWLEY: There's no need to ask them  
23 because they provided the design basis in detail  
24 in the Stone and Webster document.

25 MS. POOLE: So, in fact, you have not

1 asked them the question?

2 MR. ROWLEY: Why ask a question when I  
3 already have the answer provided by their  
4 contract?

5 MS. POOLE: That's all my questions for  
6 these witnesses.

7 PRESIDING MEMBER MOORE: Can I ask a  
8 procedural question. Your folks have a time  
9 constraint. Can you tell me what that time  
10 constraint is so we make sure that they're allowed  
11 to get their comment. When do they have to leave?

12 MS. POOLE: Well, the ABB and GoalLine  
13 folks, well, the person who had a time constraint  
14 already left. He had to leave at noon. But I  
15 would, since these people won't be allowed to  
16 testify --

17 PRESIDING MEMBER MOORE: Well, we'll  
18 take them up as soon as possible, but I just -- if  
19 someone had to make a plane then I wanted to --

20 MS. POOLE: He's already gone.

21 HEARING OFFICER WILLIAMS: I apologize.  
22 All right, well, then with -- yes?

23 MR. MILLER: Just one quick procedural  
24 matter. I'd like to just get in the record one  
25 question from Mr. Rowley, not on rebuttal, or

1       redirect, but just to get into the record the  
2       question of whether the project will accept the  
3       proposed conditions of certification contained in  
4       the FSA with regard to air quality.

5               MR. ROWLEY:  Yes, the project does; and  
6       that includes the modification proposed in Mr.  
7       Champion's testimony.

8               MR. MILLER:  And secondly, I'd like to  
9       move our exhibits into evidence.

10              PRESIDING MEMBER MOORE:  Any objection?

11              MS. WILLIS:  None.

12              MR. MILLER:  Thank you.

13              PRESIDING MEMBER MOORE:  All right.

14       We're going to have a fairly abbreviated lunch, so  
15       let's try and be back here right at 1:00.  And,  
16       yes, ma'am?

17              MS. WILLIS:  Is it possible to get our  
18       air district representatives in right after lunch?

19              PRESIDING MEMBER MOORE:  Yes, we'll do  
20       that as fast as we can.

21              (Whereupon, at 12:30 p.m., the hearing  
22       was adjourned, to reconvene at 1:00  
23       p.m., this same day.)

24                                      --o0o--

25



1                   PRESIDING MEMBER MOORE: What it boils  
2 down to.

3                   All right, so we have finished direct,  
4 cross for applicant's panel. And I'm going to  
5 turn to staff counsel and ask, counselor, would  
6 you like to present your witness.

7                   MS. WILLIS: Yes, thank you.

8                   PRESIDING MEMBER MOORE: Do they need to  
9 be sworn?

10                  MS. WILLIS: Yes, they will.

11                  Whereupon,

12                  SEYED SADREDIN and STEVE TOMLIN  
13 were called as witnesses herein, and after first  
14 having been duly sworn, were examined and  
15 testified as follows:

16                  MS. WILLIS: And before we start, if we  
17 could mark the final determination of compliance  
18 as an exhibit. I believe it's 43, next in order.

19                  MS. POOLE: And that is the final DOC  
20 with all of the response to comments? The  
21 complete set?

22                  MS. WILLIS: I believe so.

23                  MS. POOLE: Well, I would like to make  
24 sure that the one that goes in as an exhibit has  
25 the response to all of the comments attached to

1 it.

2 MS. WILLIS: Yes, it does.

3 MR. MILLER: No objection.

4 HEARING OFFICER WILLIAMS: Entered.

5 MS. WILLIS: Okay.

6 PRESIDING MEMBER MOORE: Counsel.

7 MS. WILLIS: Thank you.

8 PRESIDING MEMBER MOORE: The floor is

9 yours.

10 MS. WILLIS: I'd first like to call Mr.

11 Seyed Sadredin.

12 DIRECT EXAMINATION

13 BY MS. WILLIS:

14 Q Could you please state your name for the  
15 record?

16 PRESIDING MEMBER MOORE: You might want  
17 to spell it for --

18 MR. SADREDIN: I gave her my business  
19 card.

20 PRESIDING MEMBER MOORE: Oh, she has a  
21 business card, thank you.

22 MR. SADREDIN: Seyed Sadredin.

23 BY MS. WILLIS:

24 Q And could you please tell me your job  
25 title.

1           A     Director of Permit Services, San Joaquin  
2 Valley Unified Air Pollution Control District.

3           Q     And could you briefly describe some of  
4 your job duties or as your job duties would  
5 pertain to this case?

6           A     Well, I oversee the day-to-day  
7 operations of the district's permit services  
8 division, and my responsibilities are to develop  
9 policies and implement the policies throughout the  
10 district that pertain to permitting of stationary  
11 sources within our geographic boundary of San  
12 Joaquin Valley.

13          Q     And how long have you been in this  
14 position?

15          A     I've been with the San Joaquin Valley  
16 Unified District in that position since 1992.

17          Q     And are you sponsoring any documents  
18 here today?

19          A     We're presenting our final determination  
20 of compliance for the Elk Hills project.

21                MS. WILLIS: And that has been  
22 previously marked as exhibit 43.

23 BY MS. WILLIS:

24          Q     Could you please maybe just describe  
25 what is BACT, or give us what BACT is and what a

1 BACT analysis includes?

2 A We have a new source review rule which  
3 is the centerpiece of our permitting program. And  
4 the key requirement within the new source review  
5 rule is best available control technology.

6 It's clearly specified in the rule, and  
7 there are some definitions, also, within the  
8 federal regulations as to what a new source  
9 review -- what BACT is.

10 And best available control technology is  
11 the most effective control that has been achieved  
12 in practice for a class and category of source; or  
13 a technology that is technologically feasible and  
14 is cost effective.

15 Now, we have a number of policies and  
16 procedures as to how we determine what is BACT.  
17 I'd be happy to explain.

18 Q Could you, please?

19 A Basically we go through a top ten  
20 analysis to determine what is BACT. And there are  
21 two categories of controls that we look at,  
22 technologically feasible options and achieved in  
23 practice control options.

24 If we determine that a technology has  
25 been achieved in practice, that is it has shown

1 its reliability and effectiveness over a  
2 reasonable period of time for a piece of equipment  
3 that is similar in size and operations to what is  
4 under review by us, then we have to require that,  
5 regardless of cost. Cost doesn't matter if  
6 something has been achieved in practice.

7 On the other hand, if we are making a  
8 technology transfer from one source category to  
9 another, or from one source size to another, we  
10 can require that only it be shown that the option  
11 is cost effective.

12 Now our district has established cost  
13 effectiveness thresholds for nitrogen oxides which  
14 is the critical pollutant in this case. Our cost  
15 effectiveness threshold is \$9700 per ton.

16 So a control technology that has not  
17 been achieved in practice could only be required  
18 if we determine that its cost is less than \$9700  
19 per ton.

20 If you'd like I can talk about SCONOx  
21 and SCR and how they work into this equation and  
22 how we looked at them.

23 Q Maybe you can answer the question, does  
24 the district consider SCONOx something that would  
25 fall into the category of technology transfer?

1           A     Yeah, I think our view is somewhat at  
2           variance with both the applicant and the  
3           intervenors and the ABB vendors.

4                     We believe that SCONOX is  
5           technologically feasible if cost wasn't an issue.  
6           If you had sufficient time and resources and there  
7           were other factors going on that made it feasible  
8           for you, we think the technological issues could  
9           be resolved.

10                    The applicant has raised a number of  
11           serious questions in terms of the scale-up  
12           questions and reliability.  And although we agree  
13           that those are serious issues that need to be  
14           dealt with, we think given enough time and money  
15           they can be resolved.

16                    And as a regulatory agency we are in a  
17           position that we like to be technology forcing.  
18           If there is a likelihood that something works we  
19           would like to push that.

20                    But by law we can only require a  
21           technology that has not been achieved in practice,  
22           only if it's cost effective.

23                    In this case, given that SCONOX has only  
24           been demonstrated on small units and for a limited  
25           period of time, we're not in a position where we

1       could say this is not an industry standard, this  
2       is what is being used for these types of  
3       facilities, and it has to be used regardless of  
4       cost.

5                So while we think it's technologically  
6       feasible, we've gone through a cost effectiveness  
7       analysis and we don't think it's cost effective,  
8       therefore by law we cannot require it.

9                Q     Is there anything you would like to add  
10       about SCR and SCONox?

11               A     Just the issue of ammonia has come up,  
12       and basically the bottomline for us is that we  
13       have two technologies under review for NOx, the  
14       pollutant that we're trying to establish what is  
15       BACT for.  It's nitrogen oxides.

16                We have two technologies.  Both perform  
17       at 2.5 ppm.  Now, there are some new claims that  
18       the company might be able to go to a lower  
19       guarantee at some point in the future.  By no  
20       means, at this point, we're comfortable that 1 ppm  
21       or anything close to that is something that is  
22       technologically feasible.

23                So, the bottomline is ammonia concern.  
24       Is it sufficient enough to say throw away SCR and  
25       you have to go with something else that doesn't

1 have ammonia.

2           And for us the concern goes beyond just  
3 this one project. This is a critical broad issue  
4 for the district, that as we go through our next  
5 round of attainment demonstration plans, where we  
6 have to adopt many regulations, we don't want to  
7 go on record saying ammonia is so detrimental that  
8 SCR should not be required.

9           Because we're in a position where if we  
10 want to adopt new regulations applying to other  
11 sources out there for which there's nonammonia  
12 base controls available, or that's really the only  
13 control that we can apply to a number of sources  
14 on a districtwide basis.

15           So we think, in the long run it will be  
16 detrimental to air quality to say ammonia is so  
17 detrimental that it should not -- that SCR should  
18 not be used.

19           We've done modeling. We've looked at  
20 ammonia emissions from this project. There is no  
21 significant impact from ammonia to the public. We  
22 looked at the PM10, the secondary PM10, the issue  
23 with ammonia. Again, it's very minor, and PM10,  
24 the source of PM10 in our district from industrial  
25 sources, less than .1 percent of it comes from

1 stationary sources.

2 So we feel that there are a number of  
3 other sources that we need to focus on for PM10  
4 control. There are a lot of natural sources and  
5 other agricultural and related fugitive sources  
6 that are much more significant.

7 So, we don't believe the ammonia, both  
8 from a toxic standpoint or PM10, is significant  
9 enough to say even with two equal control  
10 technologies, you should go with the one that  
11 costs several times higher and hasn't really been  
12 demonstrated in practice yet.

13 Q Thank you.

14 MS. WILLIS: I'd like to turn to Mr.  
15 Tomlin.

16 DIRECT EXAMINATION

17 BY MS. WILLIS:

18 Q Could you please state your name for the  
19 record?

20 A Steve Tomlin.

21 Q And what is your current job title?

22 A Air Quality Engineer.

23 Q And could you please tell me, or  
24 describe your role in preparing the preliminary  
25 determination of compliance and the final

1 determination of compliance?

2 A Yes, I'm a permit process engineer, and  
3 it's part of my duties within the permit services  
4 division to evaluate the Elk Hills project.

5 We performed what's called a  
6 determination of compliance review, and this was  
7 eventually submitted to the Energy Commission.

8 Our process begins by looking at the  
9 various parts of our new source review rule,  
10 including BACT, offsets, certification, compliance  
11 and other issues.

12 We also look at what's contained in our  
13 regulation 4, which is also called prohibitory  
14 rule. And we look at established and enforceable  
15 emission limits.

16 With this project we determined BACT as  
17 2.5 ppm for NOx at one-hour average. CO at 4 ppm,  
18 15 percent O2, for three-hour average. VOC at 2  
19 ppm, 15 percent O2, that's a three-hour average.  
20 PM10 and SOx emissions we look at natural gas  
21 fired and low sulfur fuel.

22 It's important that we looked at and  
23 addressed SCONox in our BACT analysis and  
24 determined it wasn't cost effective at this time.

25 It's also important to recognize that we

1 considered BACT to be 2.5 ppm limit, not the best  
2 available control technology by itself.

3 We considered ammonia impacts in our  
4 BACT analysis and such was that the ammonia  
5 impacts were determined to be not significant, and  
6 not cause for any reason to look at any other  
7 controls other than what's being proposed for this  
8 project.

9 In offsets, the offsets are being  
10 provided for NOx, VOC and PM10 emissions and SOx  
11 emissions. The CO emission increases with this  
12 project are exempt from offsets because modeling  
13 has been performed that shows it won't be an  
14 impact for the ambient air quality standards.

15 The offsets for this project are being  
16 provided from valid ERCs that were banked in  
17 accordance with district rules. Emissions from  
18 this project are also being provided at greater  
19 than 1:1 ratio.

20 We looked at the rules for this project  
21 which include EPA new source performance  
22 standards, rule 4000. And emissions proposed by  
23 this project are well below those standards.

24 Another characteristic of EPA standards  
25 includes record-keeping, reporting, and compliance

1 testing, all of which are being proposed and will  
2 be required for this project.

3 As with any natural gas combustion  
4 device we expect visible emissions to be  
5 nonexistent. That's also a current limitation on  
6 it, for the determination of compliance.

7 We have a rule of governance nuisance,  
8 and under nuisance we looked at any potential  
9 nuisance impacts from the project. And as we  
10 previously stated, ammonia impacts determined to  
11 be not significant. As a result for that, what  
12 was referred to as toxics best available control  
13 technology or T-BACT is not required.

14 Another EPA rule, a rule that we have  
15 that's in our state implementation plan proposal  
16 covers gas turbine engines. The Elk Hills  
17 project, as proposed, meets well below these  
18 limits standards. A good rule limit for this  
19 particular project would be 12.2 ppm, and Elk  
20 Hills is proposing 2.5.

21 And as stated previously, the Elk Hills  
22 is going to be required to perform the initial  
23 compliance test and periodic compliance testing;  
24 will be equipped with continuous emission monitors  
25 on both turbines, which will be used to validate

1 the emissions.

2           Enforceable emission limits are being  
3 applied to this project. We include in  
4 performance standard in ppm. We also have hour-  
5 per-hour emission limits. We have combined  
6 facilitywide hourly emissions for NOx and CO. We  
7 also include daily emission limits for all the  
8 pollutants. We include annual emission limits and  
9 other emission limits such as a 10 ppm ammonia  
10 slip limit and a sulfur content limit.

11           All these limits are used in conjunction  
12 to establish that the proposed emissions will be  
13 met.

14           The emission limits will be verified  
15 through compliance testing. We'll be looking at  
16 initial annual source testing for PM10, NOx, VOC  
17 and CO. We'll ask for annual verification of the  
18 fuel gas sulfur content. We will also be looking  
19 at determining what the actual NOx, CO, VOC and  
20 PM10 emissions will be during startup.

21           The gas turbine engines will be equipped  
22 with continuous emission monitors which will be  
23 used to show compliance with emission limits.  
24 They will be required to establish the relative  
25 accuracy of the CEMs during the startup

1 conditions.

2 Elk Hills will be required to maintain  
3 records of fuel sulfur content, their fuel use,  
4 the continuous emission monitor results, starts  
5 and shutdown and ammonia concentrations which will  
6 be used to validate that they're meeting set  
7 emission limits.

8 In conclusion, the Elk Hills project  
9 meets all the district rules and requirements.  
10 The emission limits in the determination of  
11 compliance are both achievable and enforceable.  
12 And the applicant has provided offsets in  
13 accordance with requirements of district rules.

14 Q Mr. Tomlin, could you explain, earlier  
15 there seemed to be confusion about offsets between  
16 the applicant and CURE. Can you explain the plan  
17 that CURE is referring to?

18 A I believe the issue came up versus  
19 concerning a particular certificate, I believe it  
20 was S-0825-2, which is NOx ERC certificate.

21 At this point with the determination of  
22 compliance it's listed as that certificate  
23 scheduled to be used to interpollutantly offset  
24 PM10 emissions at a 2.42:1 ratio as previously  
25 referred to in this hearing.

1           Since that certificate -- an important  
2 point with that certificate is that the PM10  
3 emissions and PM included in our PM10 plan, exact  
4 title, I believe, is the '97 reasonable further  
5 progress plan, not the PM10 attainment plan. I'm  
6 not exactly sure of that title.

7           That plan addresses the PM10 impacts  
8 from NOx in the Valley as going towards  
9 attainment. Since that year certificate 825-2  
10 scheduled to be used for PM10 emissions, the  
11 statement, I believe, was made that it's contained  
12 in -- it's included as growth in the PM10 plan,  
13 and therefore satisfies the requirements for that  
14 certificate.

15           Q     And, Mr. Tomlin, can you briefly  
16 describe the PDOC process. I guess what I'm  
17 trying to ask is the steps involved as far as  
18 public participation and how they comment.

19           A     Yes, the determination of compliance is  
20 issued in a preliminary form which is referred to  
21 as the PDOC, or preliminary determination of  
22 compliance.

23                     Publication of a notice of that  
24 determination initiates a 30-day comment period  
25 where we will receive comments from other

1 oversight agencies and the public.

2 For this particular project we received  
3 comments from the Air Resources Board, from EPA,  
4 from CURE and from the Energy Commission.

5 At the conclusion of the comment period,  
6 we examine the comments and develop responses to  
7 the comments. And if there are any changes to the  
8 determination of compliance, we make those  
9 changes.

10 As a result, resulting from that we  
11 issued our final determination of compliance.

12 Q So just to clarify, EPA did comment on  
13 the preliminary determination of compliance which  
14 included the emission levels for BACT?

15 A Yes. EPA's comment was that they  
16 requested that we specifically address SCONox in  
17 our BACT analysis.

18 Q And you did that in the final  
19 determination of compliance?

20 A We did.

21 Q Mr. Tomlin, are there any outstanding  
22 NOVs against other Occidental or Elk Hills or  
23 Sempra?

24 A There is none that I'm aware of.

25 Q And does that conclude your testimony?

1           A     Yes, it does.

2           MS. WILLIS: I'd like to make these  
3 witnesses available for cross.

4           PRESIDING MEMBER MOORE: Thank you.  
5 Applicant.

6           MR. MILLER: May I have just one moment,  
7 please?

8           PRESIDING MEMBER MOORE: Sure.

9           MR. MILLER: We don't have any  
10 questions, thank you.

11          PRESIDING MEMBER MOORE: Thank you very  
12 much. Ms. Poole?

13          MS. POOLE: Thank you. Just a couple of  
14 questions.

15                           CROSS-EXAMINATION

16          BY MS. POOLE:

17           Q     Mr. Tomlin, can you tell me where in the  
18 PM10 plan which you were just referring to ERC-  
19 825-2 is specifically identified as growth?

20           MR. TOMLIN: There is an appendix to  
21 that plan which identifies the listed ERC numbers.  
22 ERC numbers that are in that plan may be an  
23 earlier version of that certificate.

24                   In the final determination of compliance  
25 we include what we refer to as a history of ERC

1 certificates. And the certificate 825, I believe,  
2 is included in there, one of its earlier numbers.

3 MS. POOLE: Oh, okay. It is -- I do see  
4 the earlier version of 825 listed in the final  
5 DOC.

6 Do you know the appendix number, or what  
7 it's called, just so we're all looking in the same  
8 place?

9 MR. TOMLIN: No, not offhand.

10 MR. SADREDIN: The document is called  
11 1997 PM10 attainment plan.

12 PRESIDING MEMBER MOORE: Published by  
13 the District?

14 MR. SADREDIN: Yes.

15 MS. POOLE: Okay, thank you.

16 Mr. Sadredin, is the Air District's  
17 definition of BACT an equivalent to the federal  
18 definition of LAER?

19 MR. SADREDIN: We believe our definition  
20 is more stringent than the federal definition of  
21 BACT.

22 MS. POOLE: I'm asking you if the  
23 District's definition of BACT is equivalent to the  
24 federal definition of LAER, L-A-E-R.

25 MR. SADREDIN: It's equal or better.

1 And if I could explain?

2 MS. POOLE: Yeah, you said the federal  
3 definition of BACT, that's why I'm clarifying. Do  
4 you mean LAER? Okay.

5 PRESIDING MEMBER MOORE: I think what we  
6 need to do is get the LAER acronym.

7 MS. POOLE: LAER means lowest achievable  
8 emission rate, correct?

9 MR. SADREDIN: Our view is that our BACT  
10 definition has two components, as I explained.  
11 One is what is achieved in practice. We believe  
12 that part is like federal LAER, something that has  
13 been achieved in practice for that class and  
14 category of source.

15 But our BACT definition goes beyond that  
16 and says you can look at something else that is  
17 technologically feasible, but hasn't been achieved  
18 in practice, provided that you can show that it's  
19 cost effective.

20 So we think our BACT first requires  
21 LAER, and then goes beyond it, to require anything  
22 that is even in the developmental stages, as long  
23 as it's economically feasible.

24 MS. POOLE: And are you aware that EPA  
25 has already determined that SCONox is technically

1 feasible and commercially available for large  
2 combined cycle projects?

3 MR. SADREDIN: Yes, and we agree with  
4 that.

5 MS. POOLE: And are you aware that EPA  
6 has also concluded that there are no known scale-  
7 up concerns with SCONOx?

8 MR. SADREDIN: They say it should  
9 clearly be considered, and they believe that the  
10 company has done some scale-up testing and is now  
11 making it commercially available.

12 But the questions and concerns remain.  
13 But that's a moot point because we're not  
14 challenging that. We're saying it's  
15 technologically feasible, simply it's not cost  
16 effective.

17 MS. POOLE: Okay, well, just to make the  
18 record clear, EPA has in fact determined and said  
19 that there are no known scale-up concerns with  
20 SCONOx. Do you disagree with that?

21 MR. SADREDIN: I'm not sure if I can  
22 agree that EPA has --

23 MS. POOLE: Would you like me to show  
24 you a letter stating that?

25 PRESIDING MEMBER MOORE: She asked you

1           whether or not you agreed with that.

2                       MR. SADREDIN:  I don't know if I agree  
3           with it, but, yeah, they said that in their  
4           letter.  I just don't agree that there are no  
5           concerns with the scale-up issues.

6                       MS. POOLE:  So you disagree with EPA on  
7           that issue?

8                       MR. SADREDIN:  That there is -- we  
9           believe that SCONox is technologically feasible,  
10          but there are questions, but we've set those  
11          questions aside.  Because as I said, we want to be  
12          technology force, we want to say SCONox is  
13          technologically feasible.

14                      So the only question for us, is it cost  
15          effective.  And regardless of whose numbers you  
16          take, SCONox -- or ABB's numbers, even if you  
17          accept those, they say the cost is \$19,800 per  
18          ton, which is, you know, more than twice our cost  
19          numbers --

20                      PRESIDING MEMBER MOORE:  Actually, just  
21          for my own edification, Ms. Poole asked you  
22          whether or not you believed that it was scaleable.  
23          EPA, in her statement, says it is scaleable.  Do  
24          you believe that?

25                      MR. SADREDIN:  We believe it could be

1 scaled up. There are some issues that need to be  
2 resolved, but we think they're not something that  
3 they couldn't overcome ultimately.

4 So we think it's technologically  
5 feasible; it can be scaled up. But there are some  
6 issues that need to be resolved, and they haven't  
7 fully been resolved yet.

8 PRESIDING MEMBER MOORE: Thank you.

9 MS. POOLE: Thank you. Did you think  
10 that SCONOX would work on the La Paloma Generating  
11 Project when you permitted the facility to use  
12 SCONOX?

13 MR. SADREDIN: Yeah, we believe --

14 MR. MILLER: Objection, this witness  
15 hasn't been qualified to know as to his background  
16 knowledge of that project.

17 MS. POOLE: Are you familiar with the La  
18 Paloma Generating Facility Project which was  
19 permitted by your air district recently?

20 MR. SADREDIN: Yes.

21 MS. POOLE: Did you think that SCONOX  
22 would work on that project when you permitted the  
23 facility to use SCONOX?

24 MR. SADREDIN: Yeah, we thought if the  
25 company, or the applicant was willing to take the

1 time and effort and spend the resources that it  
2 would take to resolve these problems, they could  
3 make it ultimately work.

4 MS. POOLE: Thank you.

5 PRESIDING MEMBER MOORE: Are you done?

6 MS. POOLE: I'm done.

7 PRESIDING MEMBER MOORE: Thank you. All  
8 right, then -- I'm sorry, Major has a question.

9 EXAMINATION

10 BY HEARING OFFICER WILLIAMS:

11 Q There's a statement there that air  
12 cooled heat exchangers are not a viable  
13 alternative for the San Joaquin Valley, it's too  
14 arid a climate. Do you see that?

15 MR. TOMLIN: Yes.

16 HEARING OFFICER WILLIAMS: What is the  
17 basis for that statement?

18 MR. TOMLIN: In addressing this, this is  
19 in respect to the BACT analysis as performed for,  
20 I believe it was PM10, for the cooling tower.  
21 What we looked at there is in the San Joaquin  
22 Valley, with those conditions. We don't see any  
23 of the other technology used, besides the air  
24 cooled, because of the weather impacts. And the  
25 need for inclusion in a facility's project up

1 front, meaning the design phase.

2 HEARING OFFICER WILLIAMS: So it would  
3 be your testimony that there are no air cooled  
4 exchangers in the Valley?

5 MR. TOMLIN: As a general statement I  
6 would not be able to answer that question.

7 HEARING OFFICER WILLIAMS: So a fair  
8 statement would be you're not aware of any?

9 MR. SADREDIN: Well, the San Joaquin  
10 Valley runs from north of Stockton to Bakersfield,  
11 with different climate conditions, as you know.  
12 In Bakersfield, given the high temperatures into  
13 the summer months, an air cooled evaporator will  
14 be less effective because of the high temperature.  
15 Obviously the air is not cool enough to cool the  
16 material as water would be.

17 HEARING OFFICER WILLIAMS: Because that  
18 statement seems to contradict evidence that's been  
19 presented, that an air cooled exchanger is a  
20 feasible alternative. I believe that there's some  
21 testimony on this subject in this proceeding.

22 This seems to directly contradict what  
23 has been presented before the Committee. So I'm  
24 just trying to get some clarification.

25 MR. SADREDIN: Under some conditions it

1           could be feasible, but when you have high  
2           temperatures and low humidity, which would be  
3           prevailing in the Bakersfield area, in the summer  
4           months at least, that wouldn't make it feasible.

5                        But, on the other hand, you know, in  
6           Stockton or somewhere near Sacramento, the Delta,  
7           the situation would be different.

8                        But for that particular circumstance in  
9           Bakersfield, when you experience temperatures of  
10          close to 100 degrees, you know, on a regular basis  
11          for a sustained period of time, you cannot rely on  
12          an air cooled system to perform as efficiently.

13                       HEARING OFFICER WILLIAMS:   Okay.

14                       MS. WILLIS:    Could I have one redirect  
15          question?

16                       HEARING OFFICER WILLIAMS:   Sure.

17                                        REDIRECT EXAMINATION

18          BY MS. WILLIS:

19                       Q       CURE brought up the license of the La  
20          Paloma Power Plant.  Are they still planning on  
21          using SCONOx?

22                       MR. SADREDIN:  They did receive a permit  
23          with both options, either SCR or SCONOx, having  
24          deemed those two options be equal, but when they  
25          went to construction phase the ABB, or the vendor

1 said SCONOx was not available commercially, so  
2 they could not provide it to them in time for  
3 their facility.

4 MS. WILLIS: Thank you.

5 HEARING OFFICER WILLIAMS: Anything  
6 further?

7 MS. WILLIS: Just one more question. Do  
8 you know when that was stated?

9 MR. SADREDIN: I believe it was late  
10 last year.

11 MS. WILLIS: Somewhere like November,  
12 December of 1999?

13 MR. SADREDIN: Only within the last six  
14 to nine months.

15 MS. WILLIS: Thank you.

16 PRESIDING MEMBER MOORE: Thank you very  
17 much. Recross, counsel? Ms. Poole?

18 MS. POOLE: Would you give me just one  
19 moment, please.

20 RE CROSS-EXAMINATION

21 BY MS. POOLE:

22 Q One quick question. Is an air cooled  
23 heat exchanger in air pollution --

24 MR. MILLER: Objection, --

25 MS. WILLIS: I'm going to object.

1 That's outside the scope of my one redirect  
2 question.

3 HEARING OFFICER WILLIAMS: I think she's  
4 asking that in response to the question that I  
5 asked.

6 MR. MILLER: With all due respect, I  
7 believe her opportunity is based upon the  
8 questions that counsel --

9 PRESIDING MEMBER MOORE: I think I'm  
10 going to have to hold to that. We've ruled in the  
11 past that the recross can only occur on the  
12 redirect, so, Kate, I'm sorry, I'm going to have  
13 to overrule.

14 MS. POOLE: Okay.

15 PRESIDING MEMBER MOORE: All right, let  
16 me come back then and turn to Ms. Poole.

17 MS. WILLIS: Before we move on, I did  
18 want to move the final determination of compliance  
19 into the record.

20 PRESIDING MEMBER MOORE: As stated, that  
21 includes all of the comments.

22 MS. WILLIS: The whole packet including  
23 comments.

24 PRESIDING MEMBER MOORE: Any objection?

25 MR. MILLER: No objection.

1 PRESIDING MEMBER MOORE: Move it in.

2 Okay, Ms. Poole, we'll turn to you for  
3 your --

4 MS. POOLE: Should staff complete its  
5 presentation first?

6 PRESIDING MEMBER MOORE: Oh, I'm sorry,  
7 I thought --

8 MS. WILLIS: No, we still have staff  
9 witnesses.

10 PRESIDING MEMBER MOORE: We still have  
11 the other -- I'm sorry, boy, jumping ahead of  
12 myself. Thank you for correcting me.

13 (Pause.)

14 MS. WILLIS: Staff calls Joe Loyer and I  
15 believe the final staff assessment on phase three  
16 has been marked as exhibit 19D. Mr. Loyer has  
17 been previously sworn in.

18 Whereupon,

19 JOSEPH LOYER

20 was recalled as a witness herein and having been  
21 previously duly sworn, was examined and testified  
22 further as follows:

23 DIRECT EXAMINATION

24 BY MS. WILLIS:

25 Q Could you please state your name again

1 for the record?

2 A My name is Joseph Michael Loyer.

3 Q And your qualifications were included in  
4 a final staff assessment part one, is that  
5 correct?

6 A I believe they were, yes.

7 Q Did you prepare the testimony entitled  
8 air quality, final staff assessment, part three?

9 A Yes, I did.

10 Q And do you have any changes or  
11 corrections to your testimony today?

12 A Not at this time.

13 Q Do the opinions contained in your  
14 testimony represent your best professional  
15 judgment?

16 A Yes, they do.

17 Q And could you please provide a summary  
18 of your testimony?

19 A Yes, I can. We reviewed the application  
20 for certification for the Elk Hills Power Project  
21 in the Kern County area of the San Joaquin Valley  
22 Unified Air Pollution Control District. And all  
23 the submittals by the District, EPA and  
24 intervenors.

25 The project is a gas-fired, combined

1 cycle power plant located about 25 miles west of  
2 Bakersfield. It's 500 megawatts nominal electric  
3 power output.

4 The project will use two GE Frame 7FAs  
5 with fired HRSGs. It will employ a 171 megawatt  
6 steam generator, and a six-cell cooling tower. It  
7 will use dry low NOx combustors, SCR with ammonia  
8 injection, oxidizing catalysts and good  
9 engineering practices to control emissions of the  
10 power plant.

11 The construction will consist of a water  
12 pumping station; an approximately 10-mile long,  
13 16-inch diameter water supply line; a one million  
14 gallon water storage tank; about a five-mile long,  
15 six-inch wastewater pipeline; 2500-foot long, ten-  
16 inch natural gas pipeline; nine-mile long, 230 kV  
17 transmission line. In addition to the project  
18 construction site, itself.

19 The construction is expected to take  
20 approximately 15 months.

21 The project will have several modes of  
22 operation. It will have a warm start which will  
23 last two hours; a cold start-up which will last  
24 four hours; steady state operation with and  
25 without duct firing; and will have peak load

1 operation with duct firing.

2 The project assumes 200 starts per year  
3 per turbine; 12 are assumed to be cold starts; 188  
4 are assumed to be warm starts.

5 Expected hourly, daily and annual  
6 emissions are shown in air quality tables 5  
7 through 7 of the FSA. The project emissions were  
8 modeled using ISC by the applicant after -- both  
9 before and after, I should say, the applicant  
10 discovered -- actually I'm not sure who discovered  
11 it, to be honest -- but after an error was  
12 discovered in the meteorological data file.

13 Construction impacts are shown in the  
14 air quality table 8. It shows, in my testimony  
15 this table shows a one-hour NO2 impact of 147  
16 percent of the standard, and a PM10 impact of 631  
17 percent of the standard.

18 I should say at this time that the  
19 applicant did provide me with an updated  
20 construction modeling analysis. However, this  
21 analysis was inadvertently provided late. It was  
22 meant to be provided with the modeling that was  
23 provided as a result of the met file error.

24 I have not had a chance to review this  
25 construction modeling. It has been reported to me

1 that the construction modeling reports lower NOx  
2 emissions, lower PM10 emissions -- lower NOx  
3 impacts and lower PM10 impacts.

4           However, given the impacts that have  
5 been described in table AQ8, I don't believe that  
6 there will be a significant impact from these  
7 emissions based on the short-term nature of the  
8 construction impacts, and the fact that the  
9 applicant is voluntarily including oxidizing soot  
10 filters on their construction equipment, where  
11 applicable, and ignition retarding.

12           The operational impacts were also  
13 modeled using the emissions, development in  
14 previous tables, AQ5 through 7. The impacts are  
15 shown in table AQ9 through 12. These tables show  
16 a 24-hour and an annual PM10 impact at  
17 approximately 250 percent of the standard and 150  
18 percent of the standard.

19           Cumulative impacts were modeled using  
20 ISC and include Elk Hills, La Paloma and Sunrise,  
21 but do not include the new Western Midway Sunset  
22 project. The cumulative impacts show a PM10, 24  
23 hour and annual exceedance of the standard, 238  
24 percent and 106 percent respectively.

25           I analyzed the potential ozone and

1 secondary PM10 formations from the project. I  
2 found that there were no significant potential  
3 impacts from the project's CO, NOx and VOC  
4 emissions on downwind ozone formation.

5 I also found that there were no  
6 potential impacts when the project NOx and SOx and  
7 ammonia emissions on downwind secondary PM10  
8 formation.

9 The Committee ordered staff and other  
10 interested parties to address a rigorous analysis  
11 of SCONOX BACT as it applies to this project,  
12 which staff provided in their FSA. As has been  
13 described, BACT is a level of determination. BACT  
14 has been determined for this project by the  
15 District and EPA to be 2.5, 15 percent O2,  
16 averaged over one hour for NOx; 4.0 at 15 percent  
17 O2, averaged over three hours for CO.

18 For the economic feasibility study  
19 portion of the BACT analysis, staff discovered a  
20 project that had looked at the SCONOX control  
21 method and SCR. And had no relationship  
22 whatsoever to the applicant. This project was the  
23 Towantic Project. It is contained in appendix C  
24 of the FSA.

25 Staff did several things to present this

1 information in what we felt was the most  
2 appropriate light. We combined the SCR and CO  
3 costs into one column for SCR. And we compared  
4 that to the costs of SCONOx. We did this because  
5 SCONOx is reportedly capable and has demonstrated  
6 this in the Federal facility, that they are able  
7 to reduce both NOx and CO. Therefore it is a  
8 better comparison in our view to compare the CO  
9 catalyst and the SCR to SCONOx simultaneously.

10 We further penalized the SCR technology  
11 by including 28 tons per year of particulate that  
12 is expected to be emitted because this is an SCR;  
13 and SCR typically does form PM10. SCONOx,  
14 however, does not form PM10 in this same manner.

15 Based on this analysis we found that  
16 SCONOx was still three times as much money per ton  
17 of pollutant removed than SCR.

18 The ERCs that have been cited for the  
19 project come from four sources. Two, the VOC and  
20 NOx credits, originate from the retrofit of IC  
21 engines with precombustion chambers located in the  
22 natural gas plant near the proposed power plant  
23 site. This retrofit was completed on March 20,  
24 1989.

25 The NOx ERCs, used to offset the PM10

1 project emissions at a 2.22:1 ratio for  
2 interpollutant trading, that is also -- the  
3 District also adds the 1.2:1 offset trading ratio  
4 to that.

5 They also originated from a retrofit of  
6 IC engines with precombustion chambers at a  
7 natural gas plant near the project site. That  
8 occurred December 5, 1990.

9 The SOx ERCs originated from a shutdown  
10 of four boilers at the Rio Bravo pump station,  
11 which is owned by Chevron Pipeline Midway on  
12 September 1, 1992. Neither EPA nor CARB have  
13 raised any questions regarding the validity of  
14 these ERCs, regarding their age or use in either  
15 the PDOC or the FDOC.

16 In conclusion, the Elk Hills Power  
17 Project emissions of NOx, SOx, CO will not cause  
18 violations of NO2, SO2 or CO ambient air quality  
19 standards, and therefore their impacts are not  
20 significant.

21 The project's air quality impacts from  
22 directly emitted PM10 and ozone precursors of NOx,  
23 VOC and PM10 precursors of NOx and SO2 could be  
24 significant if left unmitigated. Elk Hills will  
25 reduce emissions to the extent feasible and

1 provide emission offsets for their NOx, VOC, SO2  
2 and PM10 emissions.

3 Thus, these mitigation measures reduce  
4 the potential for directly emitted PM10, as well  
5 as ozone and secondary PM10 formation to a level  
6 of insignificance.

7 The District has submitted a final  
8 determination of compliance that concludes that  
9 the Elk Hills Power Project will comply with all  
10 District rules and regulations, and therefore has  
11 proposed a set of conditions which are presented  
12 in the staff testimony as conditions of  
13 certification.

14 Staff recommends the inclusion of two  
15 additional conditions of certification, AQC1 and  
16 AQC2 that address the construction-related  
17 impacts. Staff recommends the certification of  
18 the Elk Hills Power Project, and proposes the  
19 conditions of certification.

20 Q Mr. Loyer, I just have one question.  
21 Did you review CURE's testimony in this case?

22 A Yes, I did.

23 Q And CURE proposed a change in one of  
24 your conditions of certification, AQC2. Could you  
25 please comment on that?

1           A     The proposed change essentially was to  
2           change the requirement that the California  
3           licensed mechanical engineer not be the sole  
4           responsible entity for producing what I termed as  
5           the initial suitability report and the subsequent  
6           suitability reports.

7                     The suggestion was to use a diesel  
8           mechanic who would at least -- a diesel mechanic  
9           and vendor. The only issue I would have with that  
10          is for compliance purposes the District will not  
11          see this condition. The District will not follow  
12          up with Elk Hills to verify that they have indeed  
13          installed these oxidizing soot filters, or that  
14          they remain installed if they do get installed.

15                    The only verification that I can have is  
16          the engineer on the site. It is my view that if I  
17          have a California certified mechanical engineer  
18          who is required to put his or her stamp on all  
19          reports that they generate, they are then risking  
20          their license for the accuracy of the report.

21                    I do not believe that all diesel  
22          mechanics are licensed, although I know that there  
23          are licensing of diesel mechanics. And I am  
24          unsure of the ramifications of a diesel mechanic  
25          putting his or her signature on such a report. If

1 they are risking anything at all.

2 Q Does that conclude your testimony?

3 A It does.

4 MS. WILLIS: I'd like to make Mr. Loyer  
5 available for cross-examination.

6 PRESIDING MEMBER MOORE: Thank you.  
7 Before I offer him up to intervenors and to the  
8 applicant, Joe, let me ask you a question.

9 EXAMINATION

10 BY PRESIDING MEMBER MOORE:

11 Q When you went back and looked at the  
12 SCONOx proposal at our behest to try and come up  
13 with the conclusions that you did, --

14 A I'm sorry?

15 Q When you went back and looked at the  
16 possibility of using SCONOx in your report, did  
17 you take into account any factors of consistency  
18 over time, whether or not the levels that are  
19 projected for that technology can be achieved  
20 consistently?

21 A Whether it can achieve 2.5? Or whether  
22 it can achieve 1.3, or 1.0 --

23 Q Whether it can achieve -- let's say  
24 lower than -- we'll just leave it very general,  
25 lower than 2.5 on a consistent basis.

1           A     Currently the Federal facility seems to  
2     be, at least at a cursory review that I did, seems  
3     to be achieving lower than 2.5 emission levels.  
4     However, I am not so comfortable with the records  
5     that I have. I am not so comfortable, even if I  
6     believe the records are accurate, I'm not so  
7     comfortable that they demonstrate that the Federal  
8     facility can really sustain that.

9           Q     Why are you uncomfortable?

10          A     There seem to be a lot of ways that the  
11     Federal facility can get out of reporting higher  
12     emissions if they occur. Start-up and shutdowns  
13     notwithstanding, those are very understandable.  
14     Many technologies have a problem with start-up and  
15     shutdown emissions. They tend to spike CO and NOx  
16     quite regularly.

17                     But apparently they are allowed to  
18     exclude some points if their fuel source gets  
19     sour, if something about the turbine is not  
20     operating optimally. I got the impression from  
21     Dr. Fox's testimony that they were allowed, in  
22     many instances, to eliminate higher emissions, or  
23     at least potentially higher emissions, from their  
24     emission limit count.

25          Q     That's an impression, though? You don't

1 have any factual basis to cite that?

2 A That's true, I don't have their permit  
3 to operate, I don't have their permit to  
4 construct.

5 Q Did you come to any conclusions about  
6 the scaleability when you did the report?

7 A The EPA has come to a conclusion that  
8 the technology SCNOx is commercially available.  
9 They have concluded that there are no scale-up  
10 issues. That is a conclusion that is reached  
11 concerning the general mechanics of the device,  
12 and I would agree, it looks as if you could take  
13 this big levelor door with its seal and you could  
14 scale this up. The chemistry definitely you could  
15 scale up.

16 But, with going from any device that is  
17 much much smaller to a device that is much much  
18 larger, there are always going to be things that  
19 you're not cognizant of at the time, that you do  
20 not realize will cause a problem, and may end up  
21 causing a problem.

22 I believe in my testimony I don't state  
23 that these can't be overcome. I think they  
24 certainly can be. I'm not sure if they're enough  
25 to eliminate this technology. I'm not sure if

1 they're enough to say that EPA is wrong.

2 PRESIDING MEMBER MOORE: Thank you.

3 BY HEARING OFFICER WILLIAMS:

4 Q I believe the recently completed Sunrise  
5 proceedings had a recommendation for oxidizing  
6 soot filters, as well, is that right?

7 A That's true.

8 Q Is this air quality condition identical  
9 to the one that was provided in the Sunrise?

10 A No, it is not.

11 Q How does it differ? How is it  
12 different?

13 A The soot filter that was required, well,  
14 I'll explain here. This is an oxidizing soot  
15 filter. It will reduce PM10; it will reduce VOCs;  
16 and it will reduce CO emissions, as well.

17 Now, what was required for Sunrise was  
18 not an oxidizing soot filter, it was just an  
19 oxidation filter.

20 Q Correct.

21 A So we are not reducing PM10 -- well,  
22 theoretically the oxidation filter may reduce  
23 PM10, but not nearly as much as a soot filter.

24 The requirement there was, I believe,  
25 very different. The oxidizing filter was also

1       contested by Sunrise. They did not voluntarily  
2       want to install it. I don't remember the exact  
3       wording, but I believe it was on every piece of  
4       heavy equipment that was to be used, heavy  
5       construction equipment that was to be used on  
6       site.

7           Q     So to let me understand it, this is more  
8       elaborate than what was --

9           A     We wanted to, the staff at the  
10       Commission wanted to give Elk Hills the ability to  
11       remove the oxidizing soot filter because there was  
12       so much opposition in Sunrise to the oxidizing  
13       soot filter, and testimony stating that they may,  
14       in fact, even damage equipment if they are  
15       installed.

16                   We did not want the staff to be  
17       responsible for the damage to that equipment, or  
18       the Commission to be responsible for the damage to  
19       that equipment. So we devised a fairly elaborate  
20       condition wherein the applicant, upon determining  
21       if there were to be damage to the equipment, or in  
22       fact, if this were not a reasonable application of  
23       the oxidizing soot filter at all, could get out of  
24       requiring the installation.

25           Q     Thank you.

1           A     Sure.

2                   PRESIDING MEMBER MOORE:  Thank you very  
3 much.  To the applicant, cross-examination?

4                   MR. MILLER:  One moment, please.  I just  
5 have one question.

6                                   CROSS-EXAMINATION

7           BY MR. MILLER:

8                   Q     Mr. Loyer, when you were asked about the  
9 scaleability, you pointed out a number of  
10 potential issues in your testimony, uncertainties.  
11 Do you change your testimony in any respect?

12                   A     I do not.  I maintain that there are  
13 definitely uncertainties in going from 35  
14 megawatts to 500.

15                   Q     Thank you.  And would you agree that the  
16 technology has not been achieved in practice, as  
17 explained by Mr. Sadredin when he explained the  
18 BACT rule and their rules?

19                   A     As far as the District is concerned,  
20 their rules and regulations, he has correctly  
21 interpreted them, their policies, as well.

22                   Q     Thank you.

23                   MR. MILLER:  I have no further  
24 questions.

25                   PRESIDING MEMBER MOORE:  Thank you.

1 Ms. Poole.

2 MS. POOLE: Thank you.

3 CROSS-EXAMINATION

4 BY MS. POOLE:

5 Q Joe, just following up on something that  
6 Mr. Miller was just asking you about scale-up, you  
7 said, I think, you have concerns about scale-up  
8 from 35 megawatts to 500 megawatts. In fact, what  
9 we're talking about here is scaling up from 35 to  
10 about 150 megawatt turbine, correct?

11 A Well, I believe the Federal facility is  
12 actually a cogen operation, or a combined cycle  
13 operation where they are actually feeding steam to  
14 a steam turbine, as well, are they not? Is that  
15 not the operation there?

16 Okay. So, in comparing one to the  
17 other, I more or less included the steam turbine.  
18 Let's see, we're talking about an LM2500 compared  
19 to a GE Frame 7FA. So, the LM2500 is going to be  
20 about, what is it, 25 megawatts, I think it's  
21 about 25 megawatts.

22 And we're comparing that to a turbine  
23 that is about 150 megawatts. So comparing one  
24 train to another train, I think that might also be  
25 a fair interpretation.

1           Q     Thanks.  Some discussion about proposed  
2     AQC2.  The applicant has suggested that AQC2  
3     should be modified to require injection timing  
4     retard in high pressure injectors.  Do you agree  
5     with that?

6           A     Let me just write this down real quick.

7           Q     Okay.

8           A     There's another discussion I've had with  
9     the applicant.  I wouldn't fully object to that.  
10    That is the control method that they are  
11    proposing, especially at this late date, I think  
12    it would be reasonable to do so, if we can, in  
13    fact, incorporate it into this condition.  It  
14    might be better to have an AQC3.

15          Q     Okay, thanks.  As I understood your  
16    concern about Dr. Fox's suggested modification to  
17    AQC2, it was that you were concerned about who  
18    would certify that the equipment had actually been  
19    installed and was operating, correct?

20          A     Yeah, that's definitely part of the  
21    concern.

22          Q     So would it be possible to have the  
23    certified mechanical engineers you've recommended  
24    certify that the equipment has been installed and  
25    is being used, but incorporate the diesel engineer

1 and vendors Dr. Fox recommended in making the  
2 initial determination of whether these pieces of  
3 equipment could apply to certain construction  
4 equipment?

5 A I suppose it depends on how many cooks  
6 we want in the soup.

7 Q Your verification concern goes away,  
8 though, right?

9 A My verification -- yeah, my verification  
10 would go away with including all those  
11 individuals, if at least one of them was the  
12 California licensed mechanical engineer.

13 But, it seems to me to be a little bit  
14 making something that is already complex even more  
15 so. It seems to me that if a licensed mechanical  
16 engineer believed that they needed to have a  
17 diesel mechanic install and verify the  
18 installation was correct, that they would indeed  
19 hire such a person to work on their staff.

20 I believe I referred to this person as  
21 an independent. Therefore, I am assuming that he  
22 or she will be contracted to install this  
23 equipment.

24 Q Well, I guess my question is there seems  
25 to be two different levels we're talking about

1 here. One is making the initial determination of  
2 whether oxidizing soot filters can operate  
3 effectively on a certain piece of equipment.

4 A Correct.

5 Q And then there's another concern about  
6 verifying that the equipment's actually been  
7 installed and is being used. Am I characterizing  
8 that right?

9 A Yes. Yeah, I think so. I'm not  
10 entirely sure, but I think so.

11 Q Okay.

12 A My concern is that we want to verify  
13 that the oxidizing soot filters are installed  
14 everywhere that they can be installed, and that in  
15 the instances where they are not installed we know  
16 exactly why. And we have somebody's license on  
17 the line stating that, you know, yes, I do put my  
18 license on the line. This is not an appropriate  
19 application for this particular device. But in  
20 the instance where we have installed it and we  
21 need to un-install it because we are perceiving  
22 finding there to be some sort of damage to  
23 equipment, or there to be unacceptable, I think I  
24 give three instances, unacceptable down time, or  
25 reduced availability, or even some potential

1 significant risk to workers and the public, we  
2 would want the engineer on the site to be able to  
3 remove that device fairly quickly, as well.

4 We don't want them to submit a report  
5 and then us get back to them six months later  
6 after the thing's blown up.

7 Q Okay. EPA has not issued a draft or a  
8 final PSD permit for this project, correct?

9 A That is correct.

10 Q So EPA has not determined what BACT  
11 level will be required in the PSD permit for this  
12 project, correct?

13 A For their PSD application that would be  
14 correct.

15 Q I believe you said the cumulative  
16 impacts analysis that you did does not include  
17 Midway Sunset, is that right?

18 A That is correct. The Western Midway  
19 Sunset.

20 Q An AFC has been accepted for that  
21 project for several months, correct?

22 A The AFC for the Western Midway Sunset  
23 project has been deemed complete. They have gone  
24 through one round of data requests.

25 Q So why is that project not included in

1 the cumulative impacts analysis?

2 A In staff's view the Western Midway  
3 Sunset project was too late to be included in the  
4 cumulative analysis for this particular project.

5 Q When did you get the Towantic BACT  
6 analysis that's included with your testimony?

7 A To be honest I got that out of my in-  
8 box.

9 (Laughter.)

10 MR. LOYER: I believe it was from  
11 another staff member. I'm not entirely sure where  
12 they got it or how they happened upon it, but they  
13 did bring it up to me.

14 BY MS. POOLE:

15 Q Do you know which staff member?

16 MR. MILLER: Objection, what's the  
17 relevancy of the question?

18 MS. POOLE: It goes to the foundation  
19 for Mr. Loyer's testimony.

20 PRESIDING MEMBER MOORE: All right, I'm  
21 going to sustain the objection. Mr. Loyer, if you  
22 got it by reputable means, and you represent that  
23 it's a publicly available document, could Ms.  
24 Poole have gotten it, as well?

25 MR. LOYER: It was delivered to me by

1 one of the staff --

2 PRESIDING MEMBER MOORE: It's a  
3 published document, public document?

4 MR. LOYER: Yes, it is.

5 BY MS. POOLE:

6 Q And have you ever visited a power plant  
7 equipped with SCONOx?

8 A No. Never had the opportunity.

9 Q Okay, thanks.

10 MS. POOLE: That's all my questions.

11 PRESIDING MEMBER MOORE: Thank you very  
12 much. Redirect?

13 MS. WILLIS: We have no redirect.

14 PRESIDING MEMBER MOORE: No redirect.  
15 Thank you. I'm sorry, Major has a question.

16 EXAMINATION

17 BY HEARING OFFICER WILLIAMS:

18 Q In terms of the cumulative impact  
19 analysis, was the Western Midway Project included  
20 in Sunrise?

21 A No, it was not.

22 MS. WILLIS: I could ask one follow-up  
23 question.

24 //

25 //

1 REDIRECT EXAMINATION

2 BY MS. WILLIS:

3 Q Mr. Loyer, in the Western Midway Sunset  
4 case will all the projects in the area be included  
5 in that cumulative impact?

6 A During data requests for the Western  
7 Midway Sunset project staff requested that Midway  
8 Sunset re-do the cumulative analysis that they had  
9 presented in their AFC to include the La Paloma,  
10 the Elk Hills, the Sunrise and Western Midway  
11 Sunset, both turbine types that they are  
12 considering. They are currently considering ABB  
13 and GE.

14 We gave them specific stack  
15 characteristics to use and we also asked them, in  
16 addition to the typical cumulative analysis, to  
17 include the cumulative impacts at three different  
18 towns that were located in the nearby area. I  
19 believe it's Fellows, Darby Acres and McKittridge.

20 Q And how far away from the proposed Elk  
21 Hills Power project is the proposed Midway Sunset  
22 project?

23 A I believe it's on the order of eight  
24 miles.

25 Q Thank you.

1                   PRESIDING MEMBER MOORE: All right,  
2 offer the opportunity for recross on the redirect.  
3 Mr. Miller?

4                   MR. MILLER: No.

5                   PRESIDING MEMBER MOORE: Ms. Poole?

6                   MS. POOLE: No questions.

7                   HEARING OFFICER WILLIAMS: No? Okay.

8 You have one other witness?

9                   MS. WILLIS: We just would need to move  
10 our final staff assessment on air quality into the  
11 record.

12                   PRESIDING MEMBER MOORE: Are there  
13 objections? We'll move it in.

14                   Thank you. Ms. Poole, now I guess I can  
15 turn to you.

16                   MS. POOLE: Okay. Before I present Dr.  
17 Fox and Mr. Marcus, I would like to again object  
18 formally on the record to the exclusion of the ABB  
19 and GoalLine representatives' testimony.

20                   PRESIDING MEMBER MOORE: As comments.

21                   MS. POOLE: As an objection by a party.  
22 The Committee invited Mr. Danziger and Mr. Hilton  
23 to appear here today to provide testimony. And in  
24 a letter dated May 4th from the Committee it  
25 states: The Committee requests that you appear

1 and provide testimony concerning SCONOx technology  
2 at our hearing on May 16, 2000.

3 MS. LUCKHARDT: I'd like to object to  
4 this objection. I believe this has already been  
5 covered, we've already been through it --

6 HEARING OFFICER WILLIAMS: We can only  
7 do one at a time.

8 MS. LUCKHARDT: -- it's already been  
9 decided.

10 HEARING OFFICER WILLIAMS: We can only  
11 do one at a time.

12 MS. POOLE: Ms. Luckhardt, I'm stating  
13 my objection on the record.

14 PRESIDING MEMBER MOORE: She's stating  
15 it on the record.

16 MS. LUCKHARDT: I believe it's already  
17 on the record.

18 MS. POOLE: Several parties traveled  
19 from the East Coast to attend this hearing and to  
20 provide testimony, and would not have come just to  
21 provide public comment.

22 And we anticipated these parties  
23 appearing as witnesses and tailored our testimony  
24 with that expectation, and are at a significant  
25 disadvantage without those parties testifying.

1                   As I understand the Committee's ruling  
2                   it's based on the lack of prefiled testimony for  
3                   the witnesses, and the lack of an offer of proof.  
4                   And I would like the record to reflect that I  
5                   contacted the Hearing Officer on May 5th to see if  
6                   the Committee expected prefiled testimony for  
7                   these witnesses, and was told that all the  
8                   Committee required was an offer of proof, which I  
9                   provided with my cover letter to our May 9th  
10                  prefiled testimony.

11                  PRESIDING MEMBER MOORE: Your objection  
12                  is noted, formally noted for the record.

13                  MS. POOLE: Thank you.

14                  PRESIDING MEMBER MOORE: Thank you very  
15                  much.

16                  MS. LUCKHARDT: Can I respond? Or would  
17                  you rather I not?

18                  PRESIDING MEMBER MOORE: Actually, I  
19                  think it's probably better not to. Why don't we  
20                  just let this stand.

21                  And I'm going to turn back to Ms. Poole  
22                  and ask her for your witness.

23                  MS. POOLE: Thank you.

24                  MS. LUCKHARDT: You know, Commissioner  
25                  Moore, I really feel like I need to respond to one

1 comment that she made.

2 She indicated that she felt she was at a  
3 significant disadvantage in this situation. It  
4 wasn't until --

5 HEARING OFFICER WILLIAMS: Again,  
6 counsel, he's already made his ruling. You're out  
7 of order in terms of a response. So, I think we  
8 should just move on.

9 PRESIDING MEMBER MOORE: Well, let me  
10 just say, one of the reasons that I did rule the  
11 way that I did, one of the reasons why I said what  
12 I did 40 seconds ago is that it seems to me that  
13 we are in a position where people are trying to  
14 make sure that their position is noted on the  
15 record, and Ms. Poole has stated an opinion.

16 I don't know that it's backed up or  
17 shared up here about whether she is or is not at a  
18 significant disadvantage. But frankly, that's an  
19 opinion that she's certainly entitled to as  
20 counsel.

21 And I think I'd be reluctant to let you  
22 get into a debate on whether or not that was a  
23 relevant opinion or not. So, with your indulgence  
24 I'd like to just let the matter lie at this point  
25 and go on with the testimony. And see if we can

1 come to a clear presentation of the data.

2 And I have promised everyone that I will  
3 take that into account as fairly as I can when I  
4 render my decision. I'm not trying to prejudice  
5 your remarks or your feelings on this at all. I'm  
6 simply trying to fairly deal with the issue which  
7 I hope and trust is now behind us.

8 Ms. Poole.

9 MS. POOLE: Thank you, Commissioner.  
10 CURE's witnesses are Dr. Phyllis Fox and David  
11 Marcus. And David Marcus does need to be sworn.  
12 Whereupon,

13 DAVID MARCUS  
14 was called as a witness herein, and after first  
15 having been duly sworn, was examined and testified  
16 as follows:

17 Whereupon,

18 J. PHYLLIS FOX  
19 was recalled as a witness herein, and having been  
20 previously duly sworn, was examined and testified  
21 further as follows:

22 MS. POOLE: Should we mark the testimony  
23 with an exhibit number at this time?

24 HEARING OFFICER WILLIAMS: Yes. I  
25 believe the next in order is 44.

1 MS. POOLE: Why don't we mark Dr. Fox's  
2 testimony with the attachments as 44; and Mr.  
3 Marcus' as 45. There has also been an errata  
4 filed last week to Dr. Fox' testimony. Is that  
5 considered part of 44?

6 HEARING OFFICER WILLIAMS: Yeah, we'll  
7 consider that as part of 44.

8 DIRECT EXAMINATION

9 BY MS. POOLE:

10 Q Mr. Marcus, can we start with you? The  
11 testimony marked as exhibit 45, was that prepared  
12 by you or under your direction?

13 MR. MARCUS: Yes, it was.

14 MS. POOLE: And is the testimony  
15 provided in exhibit 45 true and correct to the  
16 best of your knowledge?

17 MR. MARCUS: Yes, it is.

18 MS. POOLE: And are the opinions  
19 contained therein based on your best professional  
20 judgment?

21 MR. MARCUS: Yes, they are.

22 MS. POOLE: And, Dr. Fox, is the exhibit  
23 marked as 44, was that prepared by you or under  
24 your direction?

25 DR. FOX: Yes, it was.

1 MS. POOLE: And are the opinions therein  
2 contained based on your best professional  
3 judgment?

4 DR. FOX: Yes, they are.

5 MS. POOLE: And are the facts contained  
6 therein true and correct to the best of your  
7 knowledge?

8 DR. FOX: Yes, they are.

9 MS. POOLE: Dr. Fox, would you like to  
10 summarize your testimony for the Committee?

11 DR. FOX: I would like to start out by  
12 saying that there is a tremendous amount of mis-  
13 information, inaccurate information floating  
14 around in this room, and I am sorely disappointed  
15 that we have decided here not to call the people  
16 who are best qualified to rebut it, which leaves  
17 me in the position of having to do it. So, I'm  
18 going to be here for a long time.

19 The applicant has submitted a large  
20 amount of testimony, much of it taken from the  
21 Three Mountain Power proceedings, which alleges  
22 that SCONOX is not technically feasible, is not  
23 commercially available, is not insurable, cannot  
24 be scaled up and so on and so forth.

25 Most of that information is very

1       inaccurate. It is literally littered with  
2       inaccurate statements. And I'm going to go  
3       through them one by one.

4               But before I launch into a point-by-  
5       point rebuttal of the massive amount of  
6       misinformation that's been submitted in this case,  
7       I would like to summarize some of the key points  
8       that I'd like you to take away with you.

9               First, I think it's important for you to  
10       realize that EPA Region 1, which are the New  
11       England States, EPA Region 9, which is the area  
12       that we're in, and the South Coast Air Quality  
13       Management District have already investigated,  
14       debated and decided the matters that the  
15       applicants, Three Mountain Power and Elk Hills,  
16       have chosen to refute in these proceedings.

17               First, those three agencies have decided  
18       that SCONox is technically feasible. They have  
19       decided that SCONox is commercially available.  
20       They have decided that SCONox can be scaled up.  
21       And I'd like to just make a few comments about the  
22       South Coast determination.

23               After EPA Region 9 declared 2.5 ppm NOx  
24       as the BACT limit in March of 1998, the South  
25       Coast reviewed that determination and adopted it

1 as BACT in the South Coast. And there was an  
2 extensive investigation by the South Coast into  
3 the SCONox technology, which included, among other  
4 things, an exhaustive review of the scale-up issue  
5 which we've been talking about here all morning.

6 And the South Coast concluded  
7 definitively that there were no scale-up issues  
8 for this technology. This technology is a  
9 monolithic catalyst. There are not scale-up  
10 issues with monolithic catalysts. I know of none,  
11 and I know of no one in the field that would tell  
12 you there is a scale-up issue with this type  
13 technology.

14 In the attachments to my testimony I  
15 include the South Coast BACT determination on  
16 SCONox in which the scale-up issue is  
17 comprehensively evaluated. And they repeat over  
18 and over and over again throughout that document  
19 that there is no scale-up issue.

20 Region 1 EPA concluded the same thing.  
21 And Region 9 EPA concluded the same thing. It is  
22 simply not an issue contrary to what you've heard  
23 here.

24 As to the cost effectiveness issue, you  
25 have heard all parties before me claim that SCONox

1 is not cost effective.

2 In our earlier hearings in the water  
3 area this same issue was addressed with respect to  
4 dry cooling and policies --

5 MS. WILLIS: I'm going to object to  
6 that.

7 PRESIDING MEMBER MOORE: I'm sorry,  
8 counselor? Excuse me one second.

9 MS. WILLIS: If we're bringing in dry  
10 cooling in this, I mean that's a different  
11 hearing.

12 PRESIDING MEMBER MOORE: Okay, I took it  
13 as just a reference point. Dr. Fox, you're not  
14 proposing to go into an analysis of dry cooling  
15 again, are you? You're just referencing that.

16 DR. FOX: No, I'm not, and you'll see  
17 the relevance very quickly.

18 PRESIDING MEMBER MOORE: So, counsel,  
19 I'm going to overrule. And I'm assuming it's  
20 simply a reference to something that occurred  
21 before. Dr. Fox.

22 DR. FOX: All right. In the case of dry  
23 cooling we had the conundrum of how you determine  
24 whether dry cooling or any other alternate  
25 technology was, quote, "economically unsound".

1 And we spent a lot of time in this room talking  
2 about how you go about doing that.

3 In this case we don't have quite the  
4 same conundrum. Here we have very clear guidance  
5 from the USEPA on how do you go about doing that.  
6 The USEPA has a guidance manual called the new  
7 source review guidance manual. Chapter B of which  
8 deals with BACT issues, which we've been talking  
9 about all morning, which lays out the guidelines  
10 that one must follow in determining what is BACT,  
11 and determining whether or not it's cost  
12 effective.

13 In addition to that, the EPA has also  
14 published a manual called the OAQPS manual, which  
15 sets out a series of calculation procedures that  
16 one uses to determine when a technology is cost  
17 effective.

18 So, unlike the dry cooling case where it  
19 was very muddy, here we have very clear guidelines  
20 as to what is cost effective and what is not. And  
21 when you follow EPA's guidelines as set out in the  
22 NSR manual, and you do the calculations according  
23 to the OHUPS manual, what you discover is that  
24 SCONOx is cost effective.

25 It costs between \$7000 and \$7500 a ton

1 when you follow the right procedures and you use  
2 the vendors' data. You only conclude that it's  
3 not cost effective when you use bogus, jimmied,  
4 outrageous numbers, which is what the applicant  
5 has done in this case.

6 I mean some of the number that they're  
7 using are completely undefensible, and --

8 MR. MILLER: I'm going to object to the  
9 terminology here --

10 DR. FOX: -- we will go through some of  
11 that.

12 MR. MILLER: I think we should keep this  
13 proceeding on a professional basis.

14 PRESIDING MEMBER MOORE: I think that's  
15 probably right. Dr. Fox, we'll keep it on a  
16 technical basis.

17 DR. FOX: Okay. The SCONox, besides  
18 being technically feasible, demonstrated in  
19 practice, commercially available, scale-uppable  
20 and economically feasible, has a number of  
21 important benefits compared to SCR.

22 SCONox, in fact, is able to achieve and  
23 has demonstrated in practice emission limits that  
24 are substantially lower than what has been  
25 demonstrated with SCR.

1           The BACT levels that have been permitted  
2           so far for large combined cycle power plants, 2.5  
3           ppm averaged over one hour, was originally based  
4           on the Federal facility, the very same facility  
5           that we're debating here.

6           Since then the Federal facility has been  
7           modified by adding additional catalysts, and it  
8           has been, since April of last year, achieving much  
9           lower emission limits than the 2.5 ppm, which is  
10          proposed for this project. It, in fact, achieves  
11          1.3 ppm.

12          I got all of the continuous emission  
13          monitoring data from that facility, and I analyzed  
14          it and determined what the BACT level would be.  
15          And that data, and it's, you know, 9000-plus data  
16          points, very clearly demonstrates that SCONox can  
17          meet 1.3 ppm NOx, averaged over one hour, and 0.7  
18          ppm CO, averaged over one hour.

19          In addition to meeting lower emission  
20          limits, SCONox also eliminates a number of  
21          problems associated with SCR. And you've heard  
22          some discussion of those this morning.

23          Because SCR oxidizes SO2 to SO3, it  
24          increases stack PM10 emissions by about one pound  
25          per hour, which is about four tons per year. It

1 also eliminates the hazards of handling and  
2 transporting ammonia. And it also eliminates  
3 maintenance issues associated with the deposition  
4 of salts within the HRSG, itself.

5           The particulate matter that's formed not  
6 only goes out the stack, but it also deposits on  
7 the boiler tubes which creates a corrosion problem  
8 and reduces heat transfer. And there are some  
9 pretty serious costs associated with the  
10 particulate deposition problem within the HRSG,  
11 itself, which are generally not included in the  
12 BACT analyses that have been done here.

13           I would now like to discuss the  
14 applicant's testimony. I would like to start out  
15 by telling you that I disagree with virtually  
16 everything that the applicant has submitted here;  
17 99 percent of what the applicant has submitted is  
18 materials that were prepared by Three Mountain  
19 Power.

20           And first I'd like to point out that  
21 much of the Three Mountain Power material is not  
22 relevant to the current siting case, and should  
23 never have been attached.

24           Some examples like that's not true is  
25 Three Mountain Power is using aqueous ammonia,

1 while this plant uses anhydrous ammonia.

2 MS. POOLE: Excuse me for interrupting,  
3 Dr. Fox, but you said some examples of why that's  
4 not true. Did you mean some examples of why Three  
5 Mountain is not applicable to this case?

6 DR. FOX: Yes, some examples of why  
7 Three Mountain is not applicable here. This  
8 project is using steam injection for power  
9 augmentation which increases emissions during peak  
10 mode operation. Three Mountain Power does not do  
11 that.

12 Three Mountain Power is offsetting their  
13 SOx emissions as PM10. One of the issues  
14 associated with SCR in this case, or any case, is  
15 the generation of PM10 from the oxidation of SO2  
16 to SO3. This project is not offsetting its SO2  
17 emissions, as far as I know.

18 In addition to the fact that the Three  
19 Mountain Power stuff is not relevant in many  
20 respects to this project, it also includes  
21 extensive misquotes of a number of things that are  
22 in the record.

23 For example, and I urge you, when you  
24 review the materials that have been submitted,  
25 rather than taking what is stated in the

1 attachments to Abreu's testimony on face, I urge  
2 you to dig into the voluminous number of  
3 attachments and read for yourself what is actually  
4 stated.

5           And among other things that are  
6 misquoted is the 3/2 status conference  
7 transcripts, which misquotes the testimony that  
8 ABB presented before the Commission in the Otay  
9 Mesa case. It misquotes the Stone and Webster  
10 report. It misquotes the ABB quote that Three  
11 Mountain Power received. And as I said, anybody  
12 that can read can look at these materials  
13 themselves and make their own conclusions on that.

14           The testimony is full of myths and  
15 misinformation and I'd like to go through them one  
16 by one.

17           So that you can all follow along, I am  
18 going to start with Abreu's testimony, labeled  
19 attachment A, testimony of Alberto Abreu regarding  
20 air quality in support of the application for  
21 certification.

22           And I'm going to start with page 5. And  
23 I'm going to start first partial paragraph on that  
24 page at the top. Abreu claims that it has been --  
25 talking about SCR now -- it has been installed in

1 hundreds of combined cycle projects similar to the  
2 Elk Hills project.

3 It's important for the Commission to  
4 realize that SCR, as far as I know, has never been  
5 employed on a large combined cycle plant like the  
6 Elk Hills project operating at 2.5 ppm NOx,  
7 averaged over one hour with an ammonia slip of 10.  
8 I'm not aware of any other facility that has  
9 operated under those conditions with an SCR  
10 installed.

11 And there's a lot of people in the  
12 industry with real questions about the ability of  
13 the ammonia injection system to respond in  
14 merchant mode operation, and particularly the  
15 start-up and shutdowns that a merchant facility  
16 would experience.

17 In the same paragraph the testimony goes  
18 on to argue that, quote: there are no significant  
19 adverse energy or environmental impacts which  
20 would eliminate this technology from  
21 consideration. That's not true. The PM10 issue  
22 is a real issue. The oxidation of SO2 to SO3 on a  
23 machine this size amounts to about one pound per  
24 hour, which is about four tons per year. And I  
25 don't think that point is in dispute here.

1           In addition, ammonia, contrary to the  
2           testimony of Mr. Radis, does form secondary PM10  
3           downwind. It's called secondary PM10 because it  
4           is downwind.

5           The allegation that secondary PM10 would  
6           not occur in this case because the San Joaquin  
7           Valley is ammonia rich is not true. There have  
8           never been any ammonia measurements made in the  
9           oil fields, as far as I know, and I've had  
10          extensive discussions with CARB scientists on this  
11          point.

12          There are very few ammonia sources in  
13          the oil field. The only one that I have heard of  
14          is the adjacent power plant that Mr. Rowley  
15          mentioned -- Mr. Radis, rather.

16          In general, there are not a lot of  
17          ammonia sources in this particular area, and one  
18          would certainly expect secondary PM10 formation  
19          from the large amount of ammonia that will be  
20          emitted by this plant and other plants in this  
21          same general area, Midway Sunset, Sunrise, La  
22          Paloma, Pastoria and so on and so forth.

23          You can expect a significant change in  
24          ambient ammonia concentrations from the large  
25          concentration of SCR-using power plants that are

1 going into this area.

2 On page 5 still, the second complete  
3 paragraph, the last line: A conclusion that  
4 SCONOx has been demonstrated in practice cannot  
5 validly be drawn since the technology has never  
6 been installed in a project utilizing F-class  
7 combustion turbines. This is simply a nonissue.  
8 The stack gas composition for a small air  
9 derivative turbine is essentially the same as for  
10 a large turbine. We're dealing with a monolithic  
11 catalyst installed in modules. There are no  
12 scale-up issues here.

13 This, as I said, was argued and put to  
14 rest in 1998 by the South Coast and by EPA. And  
15 there's no reason to continue to argue it.

16 At the bottom of page 5 and the partial  
17 paragraph at the bottom, it says: Otay Mesa is  
18 permitting the project at 2 ppm at 15 percent  
19 oxygen over a three-hour average. And this  
20 statement occurs throughout, arguing that this is,  
21 in essence, the same limit that's proposed here.

22 In other words, 2 ppm at three hours is  
23 equivalent to 2.5 ppm at one hour. That statement  
24 is true. But it's not true that the Otay Mesa  
25 project has exactly the same permit limit as this

1 project. The Otay Mesa project is being permitted  
2 at 100 tons per hour. A hundred tons per hour --

3 MS. POOLE: Do you mean 100 tons per  
4 year?

5 DR. FOX: Yes. Thanks. Is being  
6 permitted at 100 tons per year, which is  
7 equivalent to a NOx concentration limit of 1 to  
8 less than 2 ppm NOx, depending on the number of  
9 start-ups and shutdowns and the number of hours of  
10 operation in any given year.

11 Further, the goal of the Otay Mesa  
12 project is to achieve a limit of 1 ppm. But the  
13 permitted level, the 100 tons per year, is  
14 actually lower than the limit that's being  
15 contemplated for this plant.

16 MS. POOLE: And do you know what the  
17 annual ton requirement for NOx is for this plant?

18 DR. FOX: I believe it's about 143 tons  
19 per year, or roughly 40 percent higher than what  
20 is being permitted at the Otay Mesa facility.

21 And next what I would like to do is in  
22 appendix B to Abreu's testimony, which starts with  
23 an April 7th letter to Michael Kuso, followed by  
24 Three Mountain Power's response to CURE's comments  
25 in the Three Mountain Power case. And I'd like to

1 go through those.

2 Starting with page 3, at the very top of  
3 page 3 the conclusion is drawn that SCONox is not  
4 technically feasible for the Three Mountain Power  
5 project for three reasons.

6 First, it's not demonstrated in practice  
7 on turbines of the same size, and we've already  
8 talked about that. Second, vendors won't  
9 guarantee its performance on turbines of the size  
10 proposed by Three Mountain Power project.

11 That second point is simply incorrect.  
12 And the people that can confirm that unequivocally  
13 are sitting here behind me. But based on my  
14 conversations with these folks and many others,  
15 ABB is prepared to guarantee SCONox on large  
16 combined cycle plants like this one at emission  
17 levels as low as 1 ppm NOx, and 0.5 ppm CO.

18 And, in fact, in the attachments to my  
19 testimony there is a guarantee from ABB for the  
20 Nueva Azalea project at 1 ppm NOx and .5 ppm CO.

21 The third point that they raise in their  
22 argument that SCONox is not technically feasible  
23 is that SCONox has not been proposed for any  
24 facilities utilizing duct-fired HRSGs. Not true.

25 The Genetics facility in Andover,

1 Massachusetts is a duct-fired HRSG. And second,  
2 the HRSG is irrelevant anyway. All the duct  
3 burner is, is a combustion source of natural gas.  
4 And that's what's coming out of the turbine. The  
5 turbine exhaust gas is nothing more than  
6 combustion byproducts from burning natural gas.  
7 And all the duct burner does is add a tiny  
8 percentage, 3 percent or less, to the exhaust gas.  
9 It does not change in any way the design of the  
10 SCONox system.

11 MS. POOLE: Dr. Fox, are you stating  
12 that there is no difference between SCONox  
13 operation on an unfired HRSG versus a duct-fired  
14 HRSG?

15 DR. FOX: That's correct. This is a  
16 nonissue.

17 On the same page, page 3, the paragraph  
18 following these three items that we've been  
19 talking about, there is an allegation in there  
20 that reads like this: Specifically discussions  
21 cited by the Shasta County AQMD with John Gaskel  
22 of ABB confirm that ABB is not yet prepared to  
23 guarantee NOx emission rate performance for  
24 merchant mode power plants of the type and size of  
25 the Three Mountain Power project.

1                   This is stated as though it was a  
2                   conversation that occurred very recently. In  
3                   fact, John Gaskel no longer works for ABB and  
4                   hasn't for some months. He never did work for ABB  
5                   Environmental Systems, which is the vendor of  
6                   SCONOx. He worked for the turbine division.

7                   And the statement that's being referred  
8                   to here is a statement that was made in roughly  
9                   November, December of 1998. And it is no longer  
10                  valid. And I think disingenuous to use it in this  
11                  way to suggest that ABB today is not willing to  
12                  guarantee this technology. It's simply not true.

13                 MS. POOLE: Dr. Fox, is it your  
14                 understanding that this discussion that was cited  
15                 here took place before ABB had completed its  
16                 testing of the system and made its determination  
17                 of commercial availability?

18                 DR. FOX: Yes. The correspondence  
19                 actually that is cited on page 3 was made, I  
20                 believe, before ABB had actually started the  
21                 scale-up and testing program.

22                 On page 4, the second complete  
23                 paragraph, there's additional discussion of this  
24                 duct burner issue, adding to the mix the fact that  
25                 oxygen concentrations and catalyst temperatures

1 would vary quickly because of the duct burners in  
2 the HRSG. Therefore, somehow affecting the  
3 performance or design of the SCONOx system. That  
4 is not true. The experts who can testify to that  
5 are sitting behind me.

6 In the last paragraph on page 4 there is  
7 additional discussion of the Otay Mesa project  
8 which again alleges that the permit limits for  
9 that project are, quote, "precisely the same as  
10 those proposed by Three Mountain", that is simply  
11 not correct.

12 And this paragraph also characterizes  
13 the Otay Mesa project as a quote, "three year  
14 demonstration project." That is a  
15 mischaracterization. That project is not a three-  
16 year demonstration project. I understand that at  
17 one time there was some discussion of a three-year  
18 period to work out the bugs, but my understanding  
19 is that period is now reduced to six months. And  
20 that six-month period would only apply for the  
21 first facility that would get up and running in  
22 this kind of situation.

23 The Otay Mesa project is not a three-  
24 year demonstration project. Again, the people  
25 that can testify to that are sitting behind me.

1                   On page 5 at the bottom there is a  
2                   discussion or some conclusions drawn from the  
3                   Stone and Webster report. And basically it's a  
4                   series of bulleted items that start on the bottom  
5                   of page 5 and go two-thirds of the way down page  
6                   6.

7                   The first important thing for you to  
8                   realize is that all of those bulleted items were  
9                   based on a draft report which has now been  
10                  finalized. And none of the items highlighted by  
11                  these bullets are in the final report.

12                  And furthermore, they are not in the  
13                  draft report, either. Virtually every one of  
14                  these cases they represent a misunderstanding or a  
15                  mischaracterization of the report.

16                  The ABB person who was responsible for  
17                  that report and oversaw the Stone and Webster work  
18                  is sitting in the audience behind me. And if  
19                  you'd like to ask any questions, he's available.

20                  The same is true of page 6, the very  
21                  last partial paragraph on page 6. This discusses  
22                  the Marsh report which was a review of the SCONOX  
23                  technology prepared by Marsh. And, again, this  
24                  material quoted here takes out of context and  
25                  misquotes what the report actually says. And I

1 would urge you to read that for yourself.

2 On page 7 the bottom paragraph there is  
3 a discussion of the guarantee that was provided by  
4 ABB for the Nueva Azalea project, which at the  
5 time the guarantee was provided, the project was  
6 referred to as EM-1. So everyplace in here where  
7 you see EM-1, that's actually the project that's  
8 now known as Nueva Azalea.

9 And that guarantee letter is in my  
10 testimony, it's an exhibit to my testimony. But  
11 the interesting statement that occurs in this  
12 particular paragraph, and also in four or five or  
13 maybe more other places throughout the applicant's  
14 testimony, there's a statement that the Nueva  
15 Azalea guarantee requires that the buyer, SunLaw,  
16 reduce the power plant operation or the  
17 electricity generation of the plant by 67 to 68  
18 percent under certain conditions.

19 And that is a mischaracterization of  
20 what that guarantee actually says. What that  
21 guarantee actually says is that the system will be  
22 designed with a space velocity of 22,000 per hour.  
23 The space velocity is nothing more than the  
24 turbine exhaust flow divided by the volume of the  
25 catalyst.

1                   And if you take the reciprocal of it,  
2                   that's the residence time, or the amount of time  
3                   the gas remains in contact with the catalyst.  
4                   Okay.

5                   So, what the Nueva Azalea guarantee  
6                   actually says is that the system will be designed  
7                   with a certain space velocity, 22,000. If that's  
8                   not sufficient to meet the proposed BACT levels of  
9                   1 ppm NOx and .5 ppm CO, then SunLaw will assume  
10                  the liability of adding additional catalysts to  
11                  the system to reduce the space velocity to 15,000.  
12                  Okay.

13                  What Three Mountain Power has done here  
14                  in their comments to our comments in the Three  
15                  Mountain Power case, and what the applicant here  
16                  has adopted, is they have assumed that the space  
17                  velocity of 15,000 would be reached by reducing  
18                  power generation. That's not the case.

19                  The 68 percent is the ratio of 15,000 to  
20                  22,000. And it has nothing to do with power  
21                  generation. All it has to do with is stuffing  
22                  additional catalysts into the SCONox support  
23                  system to reduce the space velocity. Nothing to  
24                  do with electricity generation. And you'll see  
25                  this claim in many many places throughout this

1 testimony.

2 On page 8, under section 3, SCONOX is  
3 not cost effective. In the testimony that we  
4 submitted in the Three Mountain Power case we used  
5 the only --

6 HEARING OFFICER WILLIAMS: Excuse me,  
7 Dr. Fox. Let me note for the record that  
8 Commissioner Moore has left. I think it probably  
9 would be a good time for a break right around now.  
10 So, let's take 20 minutes, okay?

11 (Brief recess.)

12 PRESIDING MEMBER MOORE: Ms. Poole, the  
13 floor is yours, and Dr. Fox.

14 MS. POOLE: Dr. Fox, would you like to  
15 proceed where you left off?

16 DR. FOX: Yes, I think I was --  
17 continuing with my commentary on the Abreu  
18 testimony, we were on page 8 and section 3, SCONOX  
19 is not cost effective, that's the section head.

20 And remembering that these are Three  
21 Mountain Power's responses to CURE's comments in  
22 that case, this first paragraph under here  
23 addresses a cost effectiveness analysis that was  
24 presented in a journal article at the time that we  
25 filed our testimony. And as this paragraph

1 states, there was a qualifier on the cost table in  
2 that article that said, quote, "data have been  
3 abstracted from a preliminary report for U.S.  
4 Department of Energy, numbers are approximate and  
5 subject to debate."

6 Since that journal article was  
7 published, the preliminary EPA report on which it  
8 was based, was finalized. We subsequently  
9 obtained a copy of it, and it's included in my  
10 testimony as attachment 30.

11 Attachment 30 does not contain any such  
12 caveat. And attachment 30 also definitively  
13 supports those calculations with a detailed table,  
14 table A-7 in the appendix.

15 I believe Mr. Abreu testified that those  
16 analyses were incorrect because they did not  
17 include capital costs of SCONOx. That is not  
18 correct. They do include capital costs and all  
19 other reasonable costs for SCONOx which you can  
20 see for yourself by simply looking at table A-7.

21 On page 9 the bottom complete paragraph  
22 is a discussion of the March 2, 2000 status  
23 conference for Otay Mesa. And some commentary  
24 about the feasibility of scaling up SCONOx with a  
25 suggestion that the comments made by ABB in that

1 meeting suggest that scale-up is less than  
2 certain.

3 If you read that testimony what you will  
4 find is that ABB is the largest vendor of  
5 pollution control equipment in the world. And  
6 they have a well-defined, well-worn procedure for  
7 bringing a new technology to market.

8 They actually have a scale-up process  
9 that they routinely use. And in that process they  
10 routinely scale up technologies by factors of 5 to  
11 15. It is common. The scale-up that would be  
12 involved in this case would go from roughly a 25  
13 megawatt turbine to a 160 megawatt turbine, which  
14 is roughly a factor of 6, at the lower end of  
15 ABB's experience.

16 I mean they routinely scale-up over much  
17 larger factor than that. I encourage you to take  
18 a look at that testimony by Bob Hilton, who is the  
19 Vice President of ABB, and was also here earlier  
20 but did not get to present testimony. But what  
21 we're talking about here is really not unusual.  
22 It's commonly done.

23 On page 10 in the third complete  
24 paragraph there is a sentence that says, quote,  
25 "Despite USEPA Region 1's reliance on these vague

1 marketing materials to conclude that SCONOx is  
2 technically feasible, such unsubstantiated  
3 marketing claims do not constitute a demonstration  
4 of technological feasibility under USEPA  
5 guidelines."

6 I would like to point out to you that  
7 the USEPA Region 1's conclusion as to the  
8 feasibility of SCONOx was not based on vague  
9 marketing materials. What actually happened there  
10 is EPA Region 1, in consultation with engineers  
11 associated with the vendors, laid out a series of  
12 detailed technical specifications in a letter  
13 which was sent to ABB. And ABB was asked to  
14 confirm that the things in that letter were indeed  
15 correct. And ABB responded that they were.

16 Based on that correspondence EPA Region  
17 1 made its determination. That series of  
18 correspondence is included in the attachment to my  
19 testimony.

20 On page 13, the second complete  
21 paragraph, we argued in the Three Mountain Power  
22 case, and also in my testimony in this case, that  
23 even if you don't accept the continuous emission  
24 monitoring data from the Federal facility that  
25 demonstrates 1.3 ppm NOx, that Massachusetts has

1 made a BACT determination and issued permits for  
2 facilities that are lower than the 2.5 ppm  
3 averaged over one hour, which is being considered  
4 for this project.

5 Specifically, Massachusetts has  
6 permitted at least two large combined cycle plants  
7 similar to this one at 2 ppm averaged over one  
8 hour. That is lower than 2.5 ppm averaged over  
9 one hour that's being considered for this project.

10 And Three Mountain Power's response to  
11 that comment that we made, which has been adopted  
12 by Elk Hills, is that a one-hour block average  
13 applied in Massachusetts is less stringent than a  
14 one-hour rolling average proposed for Three  
15 Mountain Power.

16 Well, a block average just means that --  
17 a continuous emission monitor works continuously,  
18 and it spits out a number every so often, like  
19 every 15 minutes it will spit out a number. And  
20 what a block average is, if you take each of those  
21 15-minute averages, say there would be four in an  
22 hour, and you average them in a block.

23 That's different from a rolling average  
24 which is used in California where you start at the  
25 beginning of time and you kind of step through the

1 record four at a time, moving one increment each  
2 time along.

3 And the argument that's being made here  
4 is that the one-hour block average used in  
5 Massachusetts is less stringent than the rolling  
6 average used in California, and therefore the 2  
7 ppm limit, averaged over one hour, in  
8 Massachusetts, is no different than 2.5 averaged  
9 over one hour in California.

10 Well, it turns out that that is not  
11 correct. And in fact, it's the reverse. I took  
12 the CEMS data from the Federal facility and I ran  
13 it both ways, using a rolling average --

14 MS. POOLE: May I clarify what CEMS data  
15 means?

16 DR. FOX: Continuous emission monitor.  
17 I averaged it both ways using a rolling average  
18 and a block average. And it turns out that the  
19 block average is more conservative. Not the other  
20 way around as claimed here.

21 MS. POOLE: And when you say more  
22 conservative, you mean that the two-hour limit --  
23 or 2.5 ppm limit over a one-hour block average is  
24 more stringent than a 2.5 ppm limit over a one-  
25 hour rolling average?

1 DR. FOX: Yes. It's more stringent and  
2 it would be harder to meet. You're much more  
3 likely to exceed a block average than a rolling  
4 average.

5 On page 14 under heading A, BACT for NOx  
6 is not an emission limit of 1.3 ppm is the title  
7 of that section head. This gets into the  
8 discussion that we had this morning of  
9 demonstrated in practice, what the applicant has  
10 argued, adopting it from Three Mountain Power's  
11 response to our comments here is that the CEMS  
12 data that I used from the Federal facility doesn't  
13 establish a new BACT level, because it does not  
14 meet EPA's definition of demonstrated in practice.  
15 And they quote that definition of demonstrated in  
16 practice on page 14.

17 And that definition basically requires  
18 that the technology have been installed and  
19 operating continually for at least six months on  
20 an emission unit which has been operating at at  
21 least 50 percent of design.

22 I'd like to make three points about that  
23 conclusion. First, the cited paragraph is draft.  
24 It is not binding. It was language that was  
25 proposed in a July 1996 Federal Register that was

1 never adopted by EPA. So it has no force at all.

2 Second, it allows discretion as to what  
3 one means by operating continually. Clearly  
4 there's a lot of technologies out there that are  
5 batch, or that operate intermittently, such as a  
6 merchant power plant. And if you applied this  
7 definition blindly you would never be able to make  
8 a demonstrated and practices determination for an  
9 intermittently operating process. And there are  
10 many many many of them.

11 The definitions that I have seen of  
12 demonstrated in practice accommodates intermittent  
13 processes. In fact, I understand that CAPCOA,  
14 California Air Pollution Control Officers  
15 Association, is currently in the process of  
16 preparing draft guidance for achieved in practice,  
17 which will provide guidelines for air districts  
18 around the state that would, in fact, address  
19 batch or intermittently operating processes.

20 I'm not aware of any definition for  
21 demonstrated in practice that would exclude  
22 technologies like a merchant power plant. The  
23 Federal facility, when the CEMS data were  
24 collected that I based my analysis on, was, in  
25 fact, operating in merchant mode. And so it is

1 much more similar to the operation mode that's  
2 proposed for this project than any other data out  
3 there that I'm aware of.

4 And then finally I'd like to point out  
5 the paragraph. If you look elsewhere in the same  
6 Federal Register you will find that there is an  
7 alternate definition for demonstrating in  
8 practice, which was proposed as a modification of  
9 the PSD regulations in 52.21, 40 CFR 52.21.

10 And if you look in that Federal Register  
11 on page 38324, you will find that an alternate  
12 definition for demonstrated in practice is simply  
13 listed in a construction permit, not built, but  
14 simply listed, which means that somebody went  
15 through an analysis that resulted in selecting  
16 that technology.

17 And here, as you've heard, SCONox has  
18 been listed in the La Paloma construction permit  
19 which would have complied with this alternate  
20 definition in the same Federal Register site that  
21 is cited here on page 14.

22 Elsewhere on page 14 there is a claim  
23 that USEPA Region 9 has reviewed the Federal CEMS  
24 data that we submitted for a number of plants, and  
25 has concluded that that data does not establish a

1 new BACT emissions limit. In a personal  
2 communication is cited with Don Wynn, March 22,  
3 2000.

4 I have tried repeatedly to confirm that,  
5 and cannot. My understanding is that EPA has not  
6 made a decision yet about whether or not that data  
7 establishes a new BACT limit. They are still  
8 considering it.

9 MS. POOLE: And who have you had  
10 discussions with at EPA?

11 DR. FOX: Steve Branoff, Ed Pike, Matt  
12 Haber.

13 HEARING OFFICER WILLIAMS: I think we've  
14 had some problems with that alarm before, so be  
15 assured that we're not ignoring your safety -- our  
16 safety.

17 DR. FOX: On page 15 in the top partial  
18 paragraph there's a claim, quote, "Moreover there  
19 is no indication in any of the information  
20 provided by CURE from GoalLine Technologies, that  
21 GoalLine and ABB will guarantee 1.3 ppm NOx as an  
22 achievable emission limit for a 500 megawatt power  
23 plant like Three Mountain Power."

24 That's not true. ABB has already  
25 guaranteed a lower emission limit for the Nueva

1 Azalea project. There is a written guarantee in  
2 my testimony provided as an attachment that  
3 guarantees 1 ppm.

4 There's a number of other places on that  
5 page where it's alleged that that guarantee would  
6 require a 67 percent reduction in load. I think  
7 we've already talked about that. All it requires  
8 is stuffing a little bit of additional catalyst  
9 into an existing frame. There's nothing in that  
10 guarantee letter that says anything about reducing  
11 load. You all can look at it.

12 On page 17, the first complete  
13 paragraph, there is a reference to testimony in  
14 the Bellingham siting case which allegedly  
15 supports a regeneration gas composition that  
16 includes 4 percent hydrogen.

17 The cited testimony was not included in  
18 any of the material that I've looked at, so that  
19 is unsupported. However, more importantly, it  
20 claims 4 percent hydrogen. And my understanding  
21 is that the hydrogen content is 2. And that's an  
22 important distinction because some folks have  
23 raised concerns about hydrogen being explosive and  
24 being used in the HRSG where there is a flame.

25 Well, 4 percent is the lower explosive

1 limit, or the LEL for hydrogen. And, in fact, the  
2 system is designed for a hydrogen concentration of  
3 2 percent, just to guard against any potential  
4 explosion hazard.

5 It's analogous to anhydrous ammonia  
6 which is also used in the presence of a duct  
7 burner. Anhydrous ammonia is combustible and  
8 explosive, and the SCR system is typically  
9 designed to keep the ammonia concentration below  
10 the lower explosive limit. It's exactly  
11 analogous.

12 On page 17 still, in the third paragraph  
13 there is a claim that, again based on the  
14 unprovided Bellingham testimony, which was not  
15 provided, that the SCONox system would require  
16 280,000 gallons per day of water for methane  
17 reformation.

18 The SCONox process uses a rather  
19 standard industry process for converting natural  
20 gas into hydrogen. And some steam is used in that  
21 process. However, this figure of 280,000 gallons  
22 per day is not correct. The system is designed to  
23 condense, recover and recycle 90 percent of the  
24 steam. And the actual water demand is a tiny  
25 fraction of that. I believe it's 12,000 gallons

1 per day per turbine, or less than 1 percent, in  
2 the case of Elk Hills, of their total annual water  
3 demand of roughly 1 billion gallons.

4 MS. POOLE: Dr. Fox, to clarify  
5 something you just said, 4 percent is in fact the  
6 flammability limit for hydrogen, and the explosive  
7 limit is much higher, correct?

8 DR. FOX: No, 4 percent is the lower  
9 explosive limit.

10 I would point out to you on the bottom  
11 of page 17 where the secondary PM10 issue comes  
12 up, Three Mountain Power argued that it wasn't an  
13 issue because they are offsetting their SOx  
14 emissions as a PM10 precursor, and this project is  
15 not doing that, as far as I know.

16 I'd like to point out that there is a  
17 large amount of stuff in appendix B, which we're  
18 talking about, which is not relevant at all to the  
19 present case, because it deals with specific  
20 permit conditions in the Three Mountain Power case  
21 that don't exist here.

22 And for the record, page 20 through page  
23 36 is irrelevant and should have never been  
24 submitted.

25 I am now moving on to appendix C, which

1 is an April 18, 2000 letter from Marty McFadden to  
2 Michael Kuso with the BACT analysis attached.

3 The first page of the supplemental BACT  
4 analysis, the first bullet down at the bottom  
5 contains the following statement: Despite Three  
6 Mountain Power's efforts over a period of six  
7 weeks, ABB Alstom Power has failed to provide such  
8 a bid package, and has not offered a reasonable  
9 explanation for such failure.

10 There's a number of suggestions in this  
11 material that Three Mountain Power was unable to  
12 obtain a bid on the SCONox process which they use  
13 as evidence that the technology is not  
14 commercially available.

15 And for the record I would like to  
16 clarify what actually happened there. Three  
17 Mountain Power -- well, first, let me back up  
18 here. When you go out to get a bid on a pollution  
19 control technology which you're using to do a BACT  
20 analysis, you normally specify the pollution  
21 control system with a series of design parameters,  
22 and you send it out to pollution control vendors  
23 for a bid on a pollution control system.

24 What Three Mountain Power did was they  
25 put together a detailed bid package for a heat

1 recovery steam generator with the SCONOX installed  
2 in it. And they sent it to ABB Alstom Power in a  
3 letter dated March 7th. And they asked for a  
4 response by March 15th.

5 A response to that kind of bid package  
6 would normally take six to eight weeks, not seven  
7 days. Also, they sent the bid package to ABB  
8 Environmental. ABB Environmental does not design,  
9 build and bid heat recovery steam generators.  
10 They design, bid and build pollution control  
11 systems.

12 They were told by ABB, and there are  
13 witnesses in the audience who can testify to this,  
14 they told Three Mountain Power, at the time of the  
15 submittal, that they could not --

16 MS. WILLIS: I'm going to object as this  
17 is total hearsay. If we do have people in the  
18 audience that were a part of the conversations,  
19 that's fine. But I don't believe that Dr. Fox was  
20 part of that conversation.

21 MS. POOLE: We'd be happy to put on the  
22 percipient witness.

23 PRESIDING MEMBER MOORE: We're going to  
24 allow Dr. Fox to continue in her capacity as  
25 expert witness, and having the opinions based on

1 her field surveys. Dr. Fox.

2 DR. FOX: My understanding is that Three  
3 Mountain Power was told that ABB Environmental  
4 would not bid the HRSG, the heat recovery steam  
5 generator, but would provide a cost estimate for  
6 SCONOx, independent of the HRSG.

7 And that's the way these types of  
8 pollution control systems would normally be bid.  
9 SCR and SCONOx both go in the heat recovery steam  
10 generator, in the zone where the temperature is  
11 between 600 and 700 degrees Fahrenheit. And  
12 normally the bidding for that kind of system is  
13 handled by the HRSG vendor who then goes out to  
14 the various air pollution control technology  
15 vendors and gets bids for the technology that they  
16 will then incorporate into their design.

17 It's very unusual, when you're trying to  
18 collect data for a BACT analysis, to ask for a  
19 complete design and cost estimate on the entire  
20 HRSG and the SCONOx system. But that's what they  
21 did here, and ABB explained very clearly that they  
22 weren't going to bid the HRSG, they were going to  
23 provide a SCONOx bid.

24 And, in fact, about a month after the  
25 RFP was received by ABB, ABB provided Three

1 Mountain Power with a BACT cost effectiveness  
2 analysis that included the costs and all of the  
3 operating and maintenance expenses for the SCONOX  
4 system.

5 They did not finally provide a bid  
6 package with a guarantee attached until roughly a  
7 month later. But they did provide it.

8 And the suggestion here, and in a lot of  
9 other material that I have seen submitted in this  
10 case, suggests that ABB was somehow not responsive  
11 and did not provide the information that was  
12 requested by Three Mountain Power.

13 And based on my review of all the  
14 detailed information, each piece of information  
15 that was in question by Three Mountain Power was  
16 actually provided -- that was requested by Three  
17 Mountain Power was actually provided, or there was  
18 an explanation given for why it was not provided.  
19 Or it was simply irrelevant to the case at hand.

20 For example, they asked for --

21 PRESIDING MEMBER MOORE: I think you've  
22 made your point.

23 DR. FOX: You got the idea?

24 PRESIDING MEMBER MOORE: I've got the  
25 point. I think we'll --

1 DR. FOX: Anyway, the --

2 MR. MILLER: I'm going to interrupt. We  
3 would stipulate that the Three Mountain Power bid  
4 can be introduced into evidence if you want.

5 MS. POOLE: We would not unless we can  
6 put witnesses on to rebut that bid.

7 PRESIDING MEMBER MOORE: Go ahead, Dr.  
8 Fox.

9 MR. MILLER: She is testifying on the  
10 bid.

11 MS. POOLE: She's testifying on appendix  
12 C and on the letter that's attached to Mr. Abreu's  
13 testimony which he's submitted.

14 MR. MILLER: Well, but I believe she  
15 just now testified as to the submittal of the bid.

16 MS. POOLE: The attachment to Mr.  
17 Abreu's testimony states that ABB has not  
18 responded. Dr. Fox is responding to that  
19 statement, and saying that, in fact, they have.

20 MR. MILLER: I'm going to request that  
21 it come in.

22 PRESIDING MEMBER MOORE: Is it  
23 available? I mean is that --

24 MR. MILLER: It was actually submitted  
25 previously to the docket.

1 MS. POOLE: It's the attachment that was  
2 attached to Mr. McFadden's testimony which came in  
3 on Friday.

4 PRESIDING MEMBER MOORE: Okay, so it  
5 actually is in, then. Okay, I'll take --

6 MR. MILLER: It's --

7 MS. POOLE: No, actually it's not in,  
8 since the Committee's ruled that Mr. McFadden will  
9 only be allowed to provide public comment. That  
10 testimony does not come in as testimony.

11 PRESIDING MEMBER MOORE: Dr. Fox.

12 DR. FOX: On page 2 of the supplemental  
13 BACT analysis, the top bullet claims that the  
14 Stone and Webster engineering evaluations  
15 concluded that SCONOx only operated successfully  
16 80 percent of the time.

17 No specific page number is provided.  
18 And neither myself nor the ABB engineer who is  
19 sitting behind me who is responsible for the  
20 report, can find any support for that or has any  
21 knowledge of any such conclusion coming out of  
22 either ABB's scale-up work, or Stone and Webster's  
23 evaluation of their scale-up work.

24 Still on page 2, the third bullet  
25 there's a claim that ABB Alstom Power has

1 indicated that SCONOx is still in the design phase  
2 for turbines of the size, design and operational  
3 characteristics as those proposed for Three  
4 Mountain Power. That is not true.

5 ABB completed a comprehensive scale-up  
6 and design program which was then reviewed by  
7 Stone and Webster, and documented in the Stone and  
8 Webster report that I submitted. And based on the  
9 results of that review, ABB announced on December  
10 1, 1999, that the technology was commercially  
11 available.

12 On the bottom of page 2, under the  
13 bullet called energy and environmental impacts of  
14 SCONOx, there is a claim that the catalyst  
15 configuration for SCONOx, quote, "requires a  
16 higher back pressure in the system."

17 You heard a lot of testimony in the dry  
18 cooling session on the relationship between back  
19 pressure and reduced electricity generation. This  
20 statement is not true. And Three Mountain Power's  
21 very own supplemental BACT analysis that I am  
22 addressing here, shows it very clearly.

23 And this BACT analysis, in various  
24 places, they report a back pressure for an SCR  
25 system of 3.5 inches of water. Elsewhere in the

1 document they report a back pressure for the  
2 oxidation catalyst of .8 inches of water.

3 The total back pressure caused by Elk  
4 Hills' proposed system of an SCR and an oxidation  
5 catalyst is 3.8 plus 8, which is 4.3. And yet,  
6 elsewhere in this document Three Mountain Power  
7 reports a back pressure for the SCONOX system of 4  
8 inches of water.

9 The last time I checked, 4 is less than  
10 4.3. And so the back pressure for a SCONOX  
11 system, based on Three Mountain Power's very own  
12 analysis is lower than for the conventional SCR  
13 and oxidation catalyst. So this claim is untrue.

14 The third bullet claims that SCONOX  
15 requires considerable steam consumption as a  
16 carrier for the regeneration gas. It requires a  
17 very small amount of steam consumption, because as  
18 I explained previously, the steam is condensed and  
19 recycled.

20 The fourth bullet or the last bullet on  
21 page 2 claims that there is a significant risk  
22 that explosive concentrations of hydrogen may  
23 accumulate within the hot section of the HRSG, and  
24 downstream of the duct burners.

25 This is completely untrue. As I

1 testified to a few minutes ago, the lower  
2 explosive limit for hydrogen is 4 percent. This  
3 system is designed to deliver a hydrogen  
4 concentration of 2 percent.

5 The hydrogen is used in an inner  
6 atmosphere. You can only have an explosion or  
7 fire hazard if you have three things: the right  
8 concentration, an ignition source, flame, and  
9 oxygen. And the hydrogen is used in an inner  
10 atmosphere which is created by closing dampers on  
11 either side of each module in the catalyst system.  
12 So we have no oxygen.

13 Even if the hydrogen concentration was 4  
14 percent, as they incorrectly stated here, you  
15 still wouldn't have any explosion hazard simply  
16 because you don't have any oxygen.

17 And then finally there's the allegation  
18 that the duct burners, again somehow pose a risk.  
19 This is more of a risk for SCR, which uses  
20 ammonia, which is also explosive and combustible,  
21 than it is for SCNOx because the dampers that  
22 you've heard a number of unfavorable comments  
23 about, basically isolate the area where the gas is  
24 being used from the duct burners.

25 There's no such isolation in an SCR

1 system. So, if you want to talk about explosion  
2 hazards, the explosion hazard for an SCR system  
3 with its ammonia is much more substantial than the  
4 explosion hazard of SCONOx due to the low  
5 concentration of hydrogen in the regeneration gas.

6 On page 3 there is the claim that the  
7 SCONOx catalyst is highly sensitive to sulfur  
8 fouling. And that's true. And you heard some  
9 discussion about SCOSOx, which is used to deal  
10 with the sulfur fouling problem.

11 However, there are a couple of important  
12 things to realize. First, there's two ways to  
13 skin the cat. And contrary to the allegations  
14 you've heard here, you don't have to use a SCOSOx  
15 catalyst to deal with the sulfur problem.

16 You can additionally wash the catalyst  
17 at more frequent intervals using an 8.5 percent  
18 potassium carbonate solution. Both processes,  
19 SCOSOx and catalyst washing, are commercially  
20 viable. Both are available. Both are cost  
21 effective. The choice between them depends  
22 largely on economics.

23 The Federal facility uses the catalyst  
24 washing technique, although they have tested  
25 SCOSOx. While the Genetics Institute uses a

1 SCOSOx catalyst.

2           There was some discussion earlier by Mr.  
3 Radis that suggested that the PM10 formation from  
4 an SCR and a SCONOx system would be the same,  
5 because the sulfur emissions were the same. And  
6 there was the claim that the Stone and Webster  
7 report supported the fact that all the SCOSOx  
8 catalyst does is capture the sulfur dioxide and  
9 route it around the SCONOx catalyst and emit it  
10 out the stack.

11           That is, granted, one design option.  
12 However, if you look at the Stone and Webster  
13 report carefully, I believe page 3-9, you will see  
14 that there is an alternate operational mode which  
15 ABB is willing to sell, which would involve the  
16 installation of a scrubber to remove sulfur  
17 dioxide from the gases when the SCOSOx catalyst is  
18 regenerated.

19           So if you included a scrubber or other  
20 similar device in the design of SCONOx you would  
21 actually reduce 95-plus percent of the SO2, and  
22 essentially eliminate the SO2 to SO3 conversion  
23 that you have in an SCR, which amounts to a pound  
24 per hour, or about four tons per year of  
25 particulate matter out the stack.

1                   Still on page 3, the second bullet,  
2                   there is a statement that Three Mountain Power has  
3                   significant concerns regarding the ability to  
4                   finance the SCONox technology. Based on my  
5                   conversations with folks who are financing similar  
6                   projects, there is no concern with financial  
7                   ability, the ability to finance these plants.

8                   The folks are sitting behind me. If you  
9                   want to ask them for yourself, you can call them  
10                  up.

11                 MS. POOLE: Dr. Fox, are there in fact  
12                 not three projects now that have proposed to use  
13                 SCONox, including Genetics Facility, San Diego  
14                 State and Los Angeles Airport, that have been  
15                 financed?

16                 DR. FOX: Yes, that's correct.

17                 MR. MILLER: Excuse me, could you repeat  
18                 those three? I didn't quite get that.

19                 MS. POOLE: The Genetics Facility, San  
20                 Diego State, and Los Angeles Airport.

21                 MR. MILLER: Thank you.

22                 DR. FOX: On page 9 the third complete  
23                 paragraph there is a discussion that suggests that  
24                 there is, quote, "limited information on the  
25                 SCOSox performance, and uncertainty as to the

1 frequency of washing."

2 Based on my conversations with the  
3 vendors I'm not aware of a) limited information,  
4 or b) uncertainty as to the frequency of washing.  
5 SCOSOx has been operating since July of last year  
6 on the Genetics Facility; and based on that  
7 experience ABB anticipates that the washing  
8 frequency for SCOSOx would be roughly every three  
9 years, or every 24,000 hours of operation.

10 On page 10 at the top underneath the  
11 equation there is the suggestion that SCR has been  
12 demonstrated in practice on F-class turbines, like  
13 the GE 7FA proposed for this project. And, again,  
14 I would point out that it hasn't been demonstrated  
15 at 2.5 ppm at 10 ppm ammonia slip anywhere that  
16 I'm aware of.

17 In fact, there's actually far more  
18 operating history of SCONOx meeting an emission  
19 limit of 1.3 ppm NOx than there is for SCR meeting  
20 2.5 ppm NOx.

21 On page 11 we have the same discussion  
22 of the Stone and Webster report that I mentioned  
23 earlier, which discussion came out of a draft  
24 report. Although some of the material that's  
25 quoted in here made it into the final report, the

1 conclusions and the spin put on these bulleted  
2 items is not consistent with that report.

3 And, again, the ABB person who oversaw  
4 that work is sitting behind me and can talk to you  
5 in greater detail about it. I'd just like to make  
6 a few comments.

7 The second bulleted item suggests that,  
8 quote, "raw natural gas leakage into the heat  
9 recovery steam generator was observed in the Stone  
10 and Webster report, indicating problems in the  
11 catalyst regeneration system."

12 And then that's followed by an  
13 allegation that this may lead to increased VOC  
14 emissions. I'd like to put that into perspective.

15 There are two ways that you can design  
16 the steam reforming process that generates the  
17 hydrogen used in the regeneration process. One of  
18 them is a stand-alone, fairly standard, steam  
19 reforming process that's used throughout the  
20 industry.

21 For example, you find them all over in  
22 refining and petrochemical facilities. That  
23 process completely reacts the hydrocarbons and the  
24 natural gas feed, and you end up with a  
25 regeneration gas stream that does not have natural

1 gas contamination. And that's the way that the  
2 Federal facility operates.

3 And ABB can supply that design to  
4 anybody that wants it. They have an alternate  
5 design where the regeneration process is internal  
6 to the SCONOx system, and that process generates -  
7 - the reaction does not go to completion. And as  
8 a result you get a small amount of natural gas in  
9 your regeneration gas. It's on the order of 2 to  
10 4 percent of the regeneration gas. And some small  
11 amount can leak out.

12 However, the percent of natural gas that  
13 would be present, assuming that a small amount of  
14 it leaked out, is roughly .04 percent of the gas  
15 flow through the HRSG.

16 PRESIDING MEMBER MOORE: Dr. Fox, I'm  
17 going to ask a favor of you and ask you to  
18 condense those kinds of comments. I think that  
19 the level of detail that you're going into in your  
20 rebut is probably more than you need to, to make  
21 the point, to make your contention that these  
22 points have been inadequately addressed.

23 DR. FOX: Okay, fine.

24 PRESIDING MEMBER MOORE: So, I'll ask  
25 you to condense wherever you can.

1           DR. FOX: The point is is that even if  
2           you designed a system that had natural gas  
3           leakage, the concentration of natural gas would be  
4           infinitesimally small. It's a nonissue in other  
5           words.

6           The next bullet complains about the  
7           conclusions in the Stone and Webster report as to  
8           failure of the seals on the -- during the damper  
9           test that was done.

10          The dampers were actually a scaled-up  
11          version of the dampers was built and artificially  
12          tested by running them through 100,001 cycles,  
13          which is equivalent to about five years of  
14          operation in a very short period of time.

15          And that test showed that they worked  
16          just fine for the equivalent of three years of  
17          operation, which would be normal for most of the  
18          equipment you find in a power. The allegation  
19          here is that somehow the operation of a merchant  
20          plant would create more intense thermal cycles,  
21          which would somehow validate the tests that were  
22          done.

23          I would like to point out that the  
24          Federal Facility has been in operation since  
25          December of 1996 using these very same dampers,

1 and I'm not aware of any failure modes associated  
2 with them.

3 The Federal plant has been operating in  
4 merchant mode for nearly a year. And so this  
5 statement is not correct.

6 The next bullet suggests that because  
7 the SCONox system is still being modeled that the  
8 design is not complete. This is very misleading.  
9 It is common practice in the pollution control  
10 industry to model pollution control equipment  
11 before it is designed and installed.

12 For example, it is common practice to  
13 model the injection grid of an SCR system. ABB,  
14 in fact, conducts modeling on all of their  
15 pollution control equipment that they install,  
16 SCONox as well as other equipment, scrubbers, SCR,  
17 et cetera. Just because a system is being modeled  
18 does not mean that the design is not complete.

19 MS. POOLE: Dr. Fox, when you're talking  
20 about modeling, you mean modeling a system on a  
21 specific project that has its own specifications,  
22 correct?

23 DR. FOX: Right.

24 (Pause.)

25 DR. FOX: We're moving along.

1                   PRESIDING MEMBER MOORE: Well, you're  
2 moving paper anyway. I can see that.

3                   (Laughter.)

4                   DR. FOX: Now, we come to what's labeled  
5 exhibit 6, which is the cost effectiveness  
6 calculations which is attached to the supplemental  
7 BACT analysis submitted by Three Mountain Power.

8                   And I'd like to make a few comments  
9 about that. There is, at this point, a large  
10 number of BACT analyses that have been submitted  
11 in this case.

12                   We have a BACT analysis that was  
13 submitted by ABB, one submitted by GoalLine, one  
14 submitted by CURE, one submitted by -- one  
15 included in the FDOC prepared by the San Joaquin  
16 Valley, one prepared by the applicant. And now  
17 here we have another one, one prepared by Three  
18 Mountain Power.

19                   The only ones of those BACT analyses  
20 that are reasonable are the ones prepared by the  
21 vendors. The rest of them are not based on vendor  
22 information. They're basically based on numbers  
23 that were pulled out of mid-air.

24                   And I'd like to comment on, in a generic  
25 fashion, some of the problems with this BACT cost

1 effectiveness analysis prepared by Three Mountain  
2 Power which is now part of the record in this  
3 case.

4 MS. POOLE: Dr. Fox, are you stating  
5 that the only analyses that are reasonable are the  
6 ones that are based on the vendors' numbers?

7 DR. FOX: Yes. The vendors know how  
8 much the technology costs, and they know how much  
9 the technology costs to operate. None of the  
10 parties to this case have bothered to get vendor  
11 information to support their cost effectiveness  
12 analysis.

13 And, in fact, Three Mountain Power --

14 MS. POOLE: Excuse me, again. When you  
15 say none of the parties, you don't mean CURE,  
16 which did rely on the vendors' numbers, correct?

17 DR. FOX: Correct. None of the other  
18 parties.

19 In the case of the Three Mountain Power  
20 cost effectiveness analysis, Three Mountain Power  
21 was actually give the cost effectiveness analysis  
22 by ABB around April 7th. And Three Mountain Power  
23 did not use the vendors' numbers in preparing its  
24 cost effectiveness analysis.

25 Three Mountain Power went off on its own

1 and pulled numbers from where I don't know, you  
2 may want to ask them. But they're certainly not  
3 supported by the cost effectiveness analysis which  
4 was prepared by the vendor for this project, which  
5 I have reviewed.

6 The numbers that were used are  
7 substantially higher and are unsupported by any  
8 vendor information.

9 Other problems with the cost  
10 effectiveness analysis is first, it appears that  
11 they patterned it after the Elk Hills analysis,  
12 because they quoted extensively. So, many of the  
13 problems that I laid out in my written testimony  
14 on the applicant and the District's cost  
15 effectiveness analysis are also present in this  
16 Three Mountain Power cost effectiveness analysis.

17 They used the wrong method. They did  
18 not follow EPA guidance. They didn't adjust for  
19 periodic payments, such as catalyst replacement.  
20 They calculated the impact on electricity  
21 generation incorrectly.

22 The SCR costs are much lower than you  
23 could support by a vendor quote. They used the  
24 wrong natural gas prices for the Elk Hills  
25 project. You'll recall that there was some

1 discussion in the dry cooling discussion about  
2 natural gas prices. And the Elk Hills project,  
3 because it's located in the middle of a natural  
4 gas field, has the benefit of not having to pay  
5 transportation costs, which results in lower price  
6 for natural gas.

7 Well, this cost effectiveness analysis,  
8 which is submitted as part of Abreu's testimony,  
9 is based on the wrong set of natural gas prices.  
10 It's based on aqueous ammonia, while the applicant  
11 is using anhydrous. And it's using the wrong  
12 emissions for the Elk Hills project.

13 So it's really not relevant to the Elk  
14 Hills project. It also doesn't account for any  
15 credit for recovering platinum from the catalyst.  
16 It assumes power losses due to taking the plant  
17 off line to wash the catalyst in a five-day  
18 turnaround. In other words, you have to wash  
19 these catalysts periodically, and they assume that  
20 the plant has to have a scheduled down time just  
21 for that.

22 Catalyst washing would ordinarily occur  
23 during regularly scheduled turnarounds on either  
24 an 8000-hour frequency, which would occur during  
25 the annual turnaround, or during the three-year

1       turnaround. There isn't any separate turnaround  
2       that's required for any part of the maintenance of  
3       the SCONOX system that I'm aware of.

4                What Three Mountain Power does in this  
5       BACT analysis, and which is also done in the  
6       applicant's analysis and the District's analysis,  
7       is they use percentages of capital costs to  
8       estimate other costs, like engineering and  
9       supervision, construction and field expenses,  
10      initial spares and consumables.

11               They simply take percentages like 5  
12      percent of direct capital cost. So if you start  
13      out with a higher initial capital cost for  
14      something and you calculate all of your operating  
15      expenses, and engineering and design and  
16      installation and what-have-you, using a flat  
17      percent, then the technology that costs the most  
18      initially is always going to come out looking bad.

19               Well, you never use this percent method  
20      for doing a cost effectiveness analysis if you  
21      have valid data for these items. This is only a  
22      rough cut kind of approach that's used when you  
23      don't have anything else. When you have something  
24      else, you use it.

25               And in the case of the Three Mountain

1 Power analysis they had a BACT cost effectiveness  
2 analysis prepared by the vendor for their project  
3 that chose not to use. And instead they went to  
4 this percent of direct capital cost technique,  
5 which substantially over-estimates the cost of the  
6 technology.

7 (Pause.)

8 DR. FOX: I think I'm going to leave  
9 SCONOX for a second. Dennis Champion this morning  
10 recommended a change in mitigation measure AQC2 --

11 PRESIDING MEMBER MOORE: Air quality 2.

12 DR. FOX: Air quality 2. To include  
13 assumptions used in the construction emission  
14 calculations for injection timing retard and a few  
15 other things. And I would like to say that I  
16 agree with those, and I urge you to adopt.

17 Then what I would like to do next is  
18 rebut the testimony that you heard this morning  
19 from the applicant.

20 PRESIDING MEMBER MOORE: I'm sorry, Dr.  
21 Fox, I guess I understood that in your critique  
22 you were rebutting all the way along. Is there  
23 something new that you didn't add in the last  
24 three hours?

25 DR. FOX: I rebutted a few things as I

1 was moving through their prefiled testimony. And  
2 what I would now like to do is rebut additional  
3 things that I heard in the oral testimony this  
4 morning.

5 PRESIDING MEMBER MOORE: Well, let me  
6 stipulate that where you found an error that you  
7 contend is an error in the testimony today, and if  
8 you maintain that it recurs, a statement of it,  
9 and then a statement of the recurrence will  
10 probably do fine.

11 DR. FOX: Right. I haven't pointed out  
12 all of the recurrences of the things I've been  
13 talking about.

14 PRESIDING MEMBER MOORE: I suspected  
15 that, so that's a possibility, so were that to  
16 occur, I'll stipulate that one size will fit all  
17 with a reference to the other error, alleged  
18 errors.

19 Fine, we have AQ2. Thank you, Mr.  
20 Loyer.

21 Dr. Fox.

22 DR. FOX: There was a lot of discussion  
23 this morning by Mr. Rowley about his role in the  
24 EPRI study which allegedly resulted in the  
25 commercialization of SCR in this country.

1                   And I would like to talk a little bit  
2                   about the history of SCR and the role that EPRI  
3                   might have played.

4                   SCR was originally patented in 1959 by  
5                   an American company. And, of course, the  
6                   Americans didn't embrace it, just like they're not  
7                   embracing SCONox. So it was left up to the  
8                   Japanese to implement SCR.

9                   Japanese companies started putting SCR  
10                  systems into place in the late 1960s through the  
11                  1970s. There were many many many large SCR  
12                  installations in Japan that were built in the  
13                  1970s.

14                 SCR didn't find its way back into this  
15                 country until the mid 1980s. And when it did,  
16                 there was a strong resistance put up by industry  
17                 fighting the technology, just like you see here,  
18                 that was uniformly resistant. And one of the  
19                 leaders of the resistance was Bob Danziger, who's  
20                 sitting back here in the audience.

21                 The South Coast attempted to impose an  
22                 SCR system on one of SunLaw's facilities, and Bob  
23                 Danzinger, because he had been personally involved  
24                 in a number of ammonia spills, and the proposed  
25                 facility was across the street from an elementary

1 school, refused to allow SCR to be installed in  
2 his plant.

3 And rather than allowing it, he  
4 abandoned the investment and embarked on the  
5 program that led to the development of SCONOX.  
6 But that was the opening shot. And SCR was  
7 aggressively opposed by virtually all of industry  
8 in the 1980s, even though it was widely used  
9 successfully in Japan.

10 And EPRI is basically a research  
11 organization. They study things to death. They  
12 don't demonstrate technologies, they study  
13 technologies. They're a power industry study  
14 club.

15 (Laughter.)

16 MS. WILLIS: I'm going to object to  
17 this. I think we need to move on.

18 PRESIDING MEMBER MOORE: I think I'm  
19 going to sustain that.

20 DR. FOX: SCR was actually --

21 PRESIDING MEMBER MOORE: Unless it was  
22 meant to wake us up.

23 MR. MILLER: Let her go on.

24 (Laughter.)

25 PRESIDING MEMBER MOORE: In which case

1       you're overruled, counsel.

2                       (Laughter.)

3                       PRESIDING MEMBER MOORE:  Let's keep  
4       it --

5                       MR. MILLER:  Is that like a book club?

6                       PRESIDING MEMBER MOORE:  Okay, frankly,  
7       I'm embroiled enough in what EPRI does.  I'm not  
8       so concerned about their motives.  But let's go to  
9       your point about the differences.

10                      DR. FOX:  It was Engelhardt, I believe,  
11       based on my memory, and I was around in those  
12       days, who actually finally succeeded in getting  
13       SCR to the market, in spite of all of the industry  
14       opposition to it.

15                      And today we have the same sort of  
16       situation with SCONOx.  Industry is fighting it,  
17       not because it doesn't work, or not because of  
18       scale-up issues, or not because it's commercially  
19       available.  Those are excuses that they're using.

20                      The truth of the matter is SCONOx costs  
21       more than SCR does.  However, the key point is  
22       whether or not it's cost effective.  Just because  
23       it costs more, because you have to spend more  
24       money at the front end to put a SCONOx plant on  
25       your power plant than you do an SCR, that

1 shouldn't be the deciding factor.

2           The deciding factor should be whether or  
3 not its cost effective. And in this debate we  
4 have cost effectiveness guidelines that have been  
5 laid out by the EPA, which are routinely used in  
6 deciding appeals before the Environmental Appeals  
7 Board. We have a manual that has been published  
8 by EPA laying out procedures that one must use in  
9 preparing a cost effectiveness analysis.

10           And when you follow those guidelines and  
11 those procedures, you find that SCONOx is cost  
12 effective. And all of these arguments about  
13 scale-up and commercial feasibility and finance-  
14 ability and insurability and all of the other  
15 stuff you've heard this morning, it's nothing more  
16 than a smokescreen because Elk Hills doesn't want  
17 to pay more money for SCONOx.

18           I'm sure they know that it works, you  
19 know. There's a facility, the Federal Facility --

20           MR. MILLER: I object to this. To the  
21 extent that it professes to have knowledge of Elk  
22 Hills' motives.

23           PRESIDING MEMBER MOORE: Yeah, I'm going  
24 to sustain that. Let's stay with the technology,  
25 Dr. Fox.

1 DR. FOX: Right, I'd like to clarify  
2 that I'm talking about capital costs is more  
3 expensive, from a dollars per ton cost  
4 effectiveness, that's what it is, dollars per ton,  
5 it's comparable. And it's within the criteria.

6 PRESIDING MEMBER MOORE: The distinction  
7 between straight capital costs and cost  
8 effectiveness is clear. I get that.

9 DR. FOX: There was discussion this  
10 morning of the fact that SCONOX is batch, and thus  
11 more difficult to scale-up. I would not  
12 characterize SCONOX as a batch process. And the  
13 vendors sitting behind me agree, they do not view  
14 SCONOX as being a batch process.

15 There was the suggestion that the  
16 operating experience on the Federal Facility was  
17 somehow not relevant to the Elk Hills project  
18 because the Federal Facility is a retrofit  
19 application and the catalyst temperature is under  
20 450 degrees Fahrenheit, while the Elk Hills  
21 application will be a high temperature application  
22 with the SCONOX and the 700 degree temperature  
23 range.

24 And therefore the applicant set aside  
25 the Federal Facility experience and based their

1 arguments on the Genetics Institute facility,  
2 which is a small 5 megawatt plant in  
3 Massachusetts, arguing that that was all that was  
4 relevant here because that is a high temperature  
5 application, where the SCONox catalyst is in the  
6 600 to 700 degree region of the HRSG.

7 That's a very misleading line of  
8 argument. The SCONox catalyst, its removal  
9 efficiency is a function of temperature. The  
10 higher the temperature the better the system  
11 works. And in a high temperature application you  
12 can achieve the same removal rate with less  
13 catalyst than you can in a low temperature  
14 application.

15 The fact that the system works in a low  
16 temperature retrofit application means that it  
17 will therefore work much better in a high  
18 temperature application. It doesn't make any  
19 sense to push aside the experience of the Federal  
20 Facility and focus on the Genetics Facility and  
21 argue that the scale-up that's required is from 5  
22 megawatts to 150 megawatts. That's just not true.

23 I think it's very revealing that the  
24 experience at the Federal Facility, which is a low  
25 temperature application, works as well as it did.

1 I mean it's demonstrated 1.3 ppm NOx in a low  
2 temperature application, which is one of the  
3 reasons that ABB is confident that they can build  
4 it in a high temperature application, which is  
5 easier. I mean it's an easier design case because  
6 you've got higher temperatures, and the removal  
7 efficiency is a function of temperature.

8 And the graphs that support that are in  
9 the back of the Stone and Webster report, which is  
10 one of the attachments to my written testimony.

11 (Pause.)

12 DR. FOX: There was a critique of the  
13 ABB cost effectiveness analysis by Mr. Abreu, in  
14 which he argued that it was appropriate to base  
15 his cost effectiveness analysis on a three-year  
16 catalyst lifetime because that is all that ABB is  
17 willing to guarantee.

18 That is not accurate. ABB is willing to  
19 guarantee a ten-year lifetime if you ask for it.  
20 And the ten-year guarantee is crafted in terms of  
21 a maintenance agreement. You can sign a contract  
22 for a ten-year maintenance agreement at a cost of  
23 \$1.2 million a year, which is the annualized cost  
24 for the catalyst. Which covers all of the  
25 operating and maintenance costs associated with

1 the catalyst.

2 And that was the basis on which they  
3 estimated their cost effectiveness. They used the  
4 ten-year lifetime in their cost effectiveness  
5 analysis because they're willing to guarantee  
6 that.

7 There was an allegation that ABB had  
8 underestimated steam and gas consumption in their  
9 cost effectiveness analysis. No support was  
10 provided for it. I find it pretty amazing that  
11 anyone would argue that the vendor doesn't know  
12 what it costs for gas and steam to operate their  
13 process.

14 I suspect that the misunderstanding is  
15 based on the applicant's misunderstanding of steam  
16 use in this case. They assumed a steam demand  
17 without realizing that the system is equipped with  
18 a condensing system that condenses and recycles  
19 the steam, so the actual demand is only 10 percent  
20 of what they assumed.

21 PRESIDING MEMBER MOORE: Dr. Fox, it's  
22 25 till. I'm going to give you till ten till to  
23 wrap up. And then at that point I want to be able  
24 to reserve time for questions and to be able to  
25 hear the guests that you've asked, because I think

1 a lot of what you're talking about is probably  
2 going to come in that presentation, and I'll have  
3 questions, myself.

4 MS. POOLE: In fact, much of what Dr.  
5 Fox is addressing now are things that we had hoped  
6 these parties would address. And she's doing  
7 it instead --

8 PRESIDING MEMBER MOORE: Well, actually  
9 I understand that she's doing it, and I'm not sure  
10 that does them justice, that they couldn't be  
11 presenting this, themselves. And certainly, I  
12 assure you, I'll have questions.

13 Anyway, let's go on.

14 DR. FOX: There was some discussion of  
15 why the ABB and the GoalLine cost estimates  
16 varied. I think if you look at the closely you'll  
17 find that in all of the essential features they  
18 are the same, and the only real place where there  
19 was any difference is GoalLine assumed a higher  
20 cost per ton for anhydrous ammonia. And GoalLine  
21 also assumed some additional costs for regulatory  
22 activities associated with handling a hazardous  
23 material, namely aqueous ammonia.

24 But otherwise the costs were essentially  
25 the same. The basic system at \$13 million was the

1 same. There was a small difference in  
2 engineering. But if you compare those two cost  
3 effectiveness analyses line by line you'll see  
4 that the numbers are essentially the same.

5 With respect to the CEMS data that I  
6 used to argue that the BACT level for NOx should  
7 be 1.3 and not 2.5, you heard argument this  
8 morning that that data was incomplete, it was only  
9 37 percent complete, suggesting that there was  
10 some problem with the data set.

11 And there was also a suggestion that  
12 there was something unusual about tossing out data  
13 associated with start-up and shutdowns or with  
14 some other sorts of operational problems,  
15 implicating that it was unusual to toss out high  
16 values.

17 First, I'd like to point out that the  
18 data is not incomplete. It's complete. If the  
19 plant was operating in merchant mode and whenever  
20 the plant was operating, SCONOx was operating.  
21 The only times when there aren't data is when the  
22 plant was down because it could not sell power.  
23 That's the way merchant plants operate. It  
24 doesn't mean there's anything wrong with the data  
25 set or it's somehow incomplete.

1           Also, the data points that were tossed  
2 out are the ones that are valid exceedances that  
3 are allowed to be tossed out based on the terms  
4 and conditions of the permit.

5           Start-ups and shutdowns are excluded.  
6 And equipment failures, like turbine problems, are  
7 excluded by the permit. There was nothing unusual  
8 about that data set.

9           There was some discussion by Mr. Radis  
10 about secondary PM10. Secondary PM10 refers to  
11 PM10 that's formed downwind from the plant, as  
12 opposed to at the stack where you measure it.

13           And the assumption was that the  
14 formation of secondary PM10 is driven by NOx and  
15 SO2, completing ignoring the role that ammonia  
16 plays in it. It's pretty well known that ammonia  
17 is a sizeable fraction of the particulate matter  
18 in the San Joaquin Valley. The number that sticks  
19 in my head is about 30 percent.

20           Ammonia, indeed, forms secondary PM10.  
21 The reactions are well described and well  
22 understood. And you can pick up any atmospheric  
23 chemistry book and read about them.

24           The SCR system, by virtue of its ammonia  
25 slip, emits large amounts of ammonia that can

1 react downwind and form secondary PM10.

2 The argument that the San Joaquin Valley  
3 is ammonia rich is completely unfounded. All of  
4 the studies that have been done by CARB in the San  
5 Joaquin Valley have been done in agricultural  
6 areas, basically north of this area and on the  
7 east side of the Valley.

8 There haven't been any measurements that  
9 I was able to find, and I looked, for ammonia in  
10 the oil field areas. And there's no reason to  
11 expect that the atmosphere in that area would be  
12 ammonia rich just because there is one nearby  
13 power plant that uses an SCR system and has  
14 ammonia slip.

15 The secondary PM --

16 MR. MILLER: Excuse me, but I'm going to  
17 object here. I think this is exactly the same  
18 testimony you gave about an hour ago on this  
19 point.

20 DR. FOX: I think about an hour ago I  
21 was talking about the SO2 to SO3 conversion.

22 MR. MILLER: I think my watch indicates  
23 it was this. Perhaps we could skip this --

24 HEARING OFFICER WILLIAMS: Well, she's  
25 already under a time limit, so if she wants to use

1           it in that fashion, that's fine.

2                   MR. MILLER: Thank you.

3                   (Pause.)

4                   DR. FOX: There was a claim by Mr.  
5           Rowley that the dampers are a, quote, "complex  
6           mechanical contraption." And I would like to  
7           point out that dampers are not unusual in the  
8           power industry and in many other industries.

9                   They are widely used, and they are  
10          widely used in services that are more severe than  
11          what is being proposed here. There's nothing  
12          unusual about dampers. Dampers will be used in  
13          more than like in this plant. Dampers are widely  
14          used in pollution control systems particularly in  
15          coal-fired power plants. They're widely used in  
16          the refining industry. And they're also used in  
17          the steel industry in my experience.

18                   And some of those operating  
19          environments, particularly in the steel industry,  
20          are more severe than what we're dealing with here.  
21          There's nothing unusual about these dampers.

22                   There was a suggestion, actually this  
23          was information in response to Major's question on  
24          air cooled condensers. The FDOC claims that air  
25          cooled condensers are not viable. And somehow

1 don't work in the San Joaquin Valley.

2 In fact, there is an air-cooled  
3 condenser in operation in the San Joaquin Valley,  
4 which has been operating for at least ten years.  
5 I'm not aware of any constraints to the operation  
6 of an air cooled condenser in this kind of  
7 environment.

8 And there are people in the audience  
9 here who have worked on air cooled condensers that  
10 can testify to that.

11 MS. POOLE: Dr. Fox, in Mr. Abreu's  
12 testimony there's a statement that the River Road  
13 CEMS data is not relevant to a facility with duct-  
14 fired HRSGs because the River Road facility is an  
15 unfired HRSG. Do you agree?

16 DR. FOX: No, I do not agree. Duct  
17 firing has nothing to do with it.

18 MS. POOLE: So duct firing wouldn't  
19 affect the effectiveness of the CO oxidation  
20 catalyst?

21 DR. FOX: No, it wouldn't.

22 MS. POOLE: Can SCR achieve lower  
23 emission limits than 2.5 ppm NOx averaged over one  
24 hour?

25 DR. FOX: It can. The lower you go the

1 less cost effective it becomes.

2 MS. POOLE: Do you have any reason to  
3 believe that SCONOx will not achieve the same or  
4 lower emission rates in a Frame 7 turbine as it  
5 has achieved on smaller turbines?

6 DR. FOX: No, I don't.

7 MS. POOLE: Based on your discussion  
8 with GoalLine and ABB representatives, are the  
9 terms and conditions of GoalLine's and ABB's  
10 guarantee for SCONOx similar to the terms and  
11 conditions offered by other pollution control  
12 technology vendors, such as SCR?

13 DR. FOX: Yes, they are.

14 MS. POOLE: And can GoalLine supply  
15 power plant developers with SCONOx?

16 DR. FOX: Yes, they can.

17 MS. POOLE: Under what conditions?

18 DR. FOX: Well GoalLine basically  
19 supplies SCONOx system into the market for  
20 facilities that are less than 100 megawatts in  
21 size. ABB occupies the niche above 100 megawatts.

22 If ABB chooses not to bid a project or  
23 supply it, for whatever the reason, then as I  
24 understand the licensing agreement, GoalLine has  
25 the right of offering the technology.

1 MS. POOLE: And can you just clarify  
2 whether you believe that the cost effectiveness  
3 analysis submitted by CURE is reasonable?

4 DR. FOX: Yes, I think it is.

5 MS. POOLE: And to your knowledge are  
6 one-year equipment warranties standard for SCR  
7 systems?

8 DR. FOX: One year?

9 MS. POOLE: For equipment and a three-  
10 year catalyst warranty?

11 DR. FOX: Yes.

12 MS. POOLE: And one question for Mr.  
13 Marcus. Wake up, Dave.

14 (Laughter.)

15 HEARING OFFICER WILLIAMS: Go ahead.

16 DIRECT EXAMINATION

17 BY MS. POOLE:

18 Q You heard Dr. Fox explain that the gas  
19 prices used in Three Mountain's cost effectiveness  
20 analysis were incorrect for this project, because  
21 Elk Hills will be getting its gas from Occidental  
22 on site, rather than transported from afar.

23 Do you have any comment on that?

24 MR. MARCUS: Yes. The market price for  
25 gas, if there were an arm's length transaction

1 between the seller and the buyer, has to take  
2 account of any transport charges.

3 If Occidental is selling to a buyer who  
4 is not locally connected, but had to transport gas  
5 through the PG&E system, the buyer would have to  
6 pay a PG&E transport charge. And the Occidental  
7 price would then have to be netted back to take  
8 account of that.

9 So, the price that the seller can  
10 receive, if they're using the transport system, is  
11 net of the part of the money that goes to PG&E.

12 And you therefore expect that the price  
13 that Elk Hills would pay Occidental -- that  
14 Occidental wouldn't get any more money from Elk  
15 Hills than they would get from any other buyer.

16 That would imply that the appropriate  
17 price to use in a calculation of what Elk Hills  
18 would pay as buyer of gas should be a market  
19 price, net of intrastate transportation charges  
20 that they wouldn't have to pay.

21 It's possible to argue that well,  
22 there's market power going the other way, and in  
23 an arm's length transaction Occidental would say  
24 to Elk Hills, as the buyer, well, from anybody  
25 else you'd have to pay transportation charges to

1 PG&E, so this time you're going to have to pay  
2 them to us. But you're going to have to pay them  
3 anyway.

4 And in that case, if the seller had the  
5 market power, the buyer would end up paying a  
6 market price as if they were paying money to PG&E,  
7 although they would actually be paying it to  
8 Occidental.

9 If it were truly an arm's length case  
10 and either one had market power, you'd negotiate  
11 between those two positions and you'd end up  
12 somewhere in between.

13 So, either way, if you're treating this  
14 like an arm's length transaction, a market price  
15 that includes a PG&E tariff cost is not the  
16 appropriate price to use for what Elk Hills would  
17 pay for gas to Occidental.

18 If it's an affiliate transaction, of  
19 course, they can pick any price they want, subject  
20 perhaps to IRS audit about whether they're  
21 shifting profits between one and the other.

22 And there's no way to tell a priori what  
23 the nominal price of the transaction will be.

24 MS. POOLE: But in this case it would be  
25 an affiliate transaction, correct?

1                   MR. MARCUS: As I understand it, if  
2 Occidental is selling gas to Elk Hills it will be  
3 an affiliate transaction.

4                   MS. POOLE: Thank you. The witnesses  
5 are available for cross. Would you like to get  
6 the other representatives --

7                   PRESIDING MEMBER MOORE: I would in a  
8 moment, but you know what, I'd like to give our  
9 stenographer a short break. And so we're going to  
10 call time out, and come back right at 5:00. And  
11 then we'll -- I'm going to let questions come to  
12 your witnesses, and then we'll entertain the  
13 comments. Or do you want to go the other way  
14 around?

15                   MS. POOLE: It might be more effective  
16 if we allow the comment first.

17                   PRESIDING MEMBER MOORE: Fine.

18                   MS. POOLE: And then do cross.

19                   PRESIDING MEMBER MOORE: Happy to do it.  
20 Okay, we're on break.

21                   (Brief recess.)

22                   PRESIDING MEMBER MOORE: All right, now  
23 what I have indicated to Ms. Poole was that we can  
24 now go to the speakers that she's invited, and I  
25 will simply say welcome to them.

1                   Oh, a housekeeping order, Major Williams  
2                   informs me directly, but I'd better sit down --  
3                   tired of sitting, as is everyone else. But, if we  
4                   go past 6:00 the place locks down. So you've got  
5                   to go in and out of this door here if you go  
6                   outside, and if you do, you're trapped by a  
7                   forcefield outside the door, and you have to pick  
8                   up the phone to call the guard to get it open.

9                   So, let's just, if you need to go  
10                  outside for something, just be advised, that's the  
11                  way to get back in, if we go that late.

12                  And, so, Ms. Poole, to you, and I'll  
13                  simply ask that where material's already been  
14                  covered, obviously it's not important to go over  
15                  it again. But we're interested in hearing what  
16                  they have to say, and what they can tell us about  
17                  the product.

18                  MS. POOLE: Thank you, Commissioner.  
19                  Because the Committee had asked CURE to sponsor  
20                  these witnesses, the way that we prepared was to  
21                  have a series of questions for Mr. Danziger and  
22                  Mr. Hilton, or Mr. Oegema in his place.

23                  And they haven't prepared any public  
24                  comments, so to speak. So, I would like to just  
25                  walk them through this if that's all right.

1                   PRESIDING MEMBER MOORE: Well, again, I  
2                   said earlier I think that's probably not really  
3                   appropriate for comment. I'm trying to keep this  
4                   on the up and up.

5                   You might just outline the -- I'll tell  
6                   you what, what do you expect them to hit in this  
7                   presentation? Why don't you just tell me right  
8                   now, and I assume they're listening while you're  
9                   talking, what are the high points that you think  
10                  comments would hit?

11                  MS. POOLE: Well, basically --

12                  PRESIDING MEMBER MOORE: I mean I assume  
13                  they know their product --

14                  MS. POOLE: -- what's been covered here  
15                  today, which is, you know, whether SCONOX has  
16                  scale-up problems, what emissions they expect to  
17                  achieve on larger turbines like the Frame 7's, the  
18                  cost effectiveness of the product, the guarantees  
19                  that ABB and GoalLine are willing to offer. And  
20                  to address some of the, what I would call  
21                  misrepresentations in the record as to both of the  
22                  companies' positions.

23                  PRESIDING MEMBER MOORE: Well,  
24                  misrepresentations, I mean they've obviously been  
25                  listening, so they can make a presentation about

1       what their product is all about, clearly. And my  
2       sense is that this is the kind of thing that they  
3       might be telling a prospective client, in any  
4       case. So I assume that their presentations are  
5       probably pretty well honed, in any case.

6               MS. POOLE: Well, I will let them  
7       address that. All I can tell you is that this is  
8       what they were prepared to do, and I'm not sure  
9       that they're prepared to present anything without  
10      some question-and-answer.

11             PRESIDING MEMBER MOORE: I probably have  
12      some questions. I'll see if I can ask intelligent  
13      questions for a change, and try and get some of  
14      that on the record.

15             So, why don't we introduce them and  
16      let's let them talk.

17             HEARING OFFICER WILLIAMS: Again, that  
18      center mike isn't working, so we're going to have  
19      to have a --

20             PRESIDING MEMBER MOORE: Is there a  
21      reason why we couldn't turn the podium -- well,  
22      all right. They can have a seat right here.  
23      That's just as good. Just as good.

24             Gentlemen, thank you for your patience.  
25      You've been -- to sit through one of these

1       hearings is an extraordinary feat in any case, so,  
2       welcome.

3               Please introduce yourselves.

4               MR. MILLER:  Excuse me, I apologize for  
5       interrupting you.  Could we have just a  
6       demarcation point in the record clearly that this  
7       comment period now has begun and that we're no  
8       longer --

9               PRESIDING MEMBER MOORE:  This is a  
10       comment period and --

11              MR. MILLER:  -- in the evidentiary  
12       record?

13              PRESIDING MEMBER MOORE:  -- this is --  
14       that's a good point, Mr. Miller.  This is a  
15       comment period, in a similar way that I instructed  
16       Ms. Poole that I wasn't going to have her asking  
17       questions of the folks who were going to comment,  
18       I won't let you question them, and I won't let  
19       staff question them.  But I can.  That's one of  
20       the privileges of power and so we can have a  
21       dialogue and you can listen.

22              MR. MILLER:  Thank you.

23              PRESIDING MEMBER MOORE:  Yes, sir.

24              MR. DANZIGER:  My name is Robert  
25       Danziger.  I am the Chairman Emeritus of Goalline

1 Environmental Technology. I'm also the Chairman  
2 and CEO of Sunlaw Energy Corporation, which is the  
3 proponent of Nueva Azalea project.

4 PRESIDING MEMBER MOORE: Where is  
5 GoalLine based?

6 MR. DANZIGER: Knoxville, Tennessee.

7 MR. OEGEMA: Okay, my name is Rick  
8 Oegema. I'm the Product Manager for SCONOX with  
9 ABB Alstom Power. I'm here in Bob Hilton's  
10 absence.

11 PRESIDING MEMBER MOORE: Okay, he's the  
12 gentleman who had to leave earlier on the flight?

13 MR. OEGEMA: That's correct.

14 PRESIDING MEMBER MOORE: And where are  
15 you based?

16 MR. OEGEMA: Out of Knoxville,  
17 Tennessee.

18 PRESIDING MEMBER MOORE: Same place.

19 MR. DANZIGER: Commissioner Moore, we  
20 were not prepared to make public comment, as you  
21 know, we were invited to testify in this matter.  
22 I called Major Williams to ask if we were to bring  
23 anything, he said no. We prepared for cross-  
24 examination. We prepared for some direct  
25 questions.

1           As Harry Truman, to use an analogy, he  
2           said -- or rough quote, he said, "If you want me  
3           to speak for two hours, I can do it now. If you  
4           want me to speak for an hour, give me a week. If  
5           you want me to speak for five minutes, I'll need a  
6           couple of weeks to prepare."

7           As we did not prepare for public comment  
8           here in any way, it is -- we are not prepared to  
9           make -- or I, at least, am not prepared to make  
10          comment. And I need to know how long we have,  
11          because to make any sort of meaningful comment  
12          without any preparation will take a considerable  
13          period of time.

14          PRESIDING MEMBER MOORE: Well, I'll tell  
15          you what. I'm prepared to talk for say up to half  
16          an hour or so. And I think, in fairness, given  
17          the time that you've waited -- let me ask you a  
18          couple of questions. Let's see if we can get the  
19          ball rolling and get --

20          MR. DANZIGER: Could I just say that  
21          I'll be happy to answer any questions you have, of  
22          course, but in that period of time I'm simply not  
23          prepared to comment beyond just a couple of top  
24          level things, which I'll be happy to do.

25          But I can't possibly address the issues

1 that were raised, the misrepresentations that were  
2 made, and the gross assumptions that were  
3 articulated here anywhere remotely in that period  
4 of time without very substantial preparation.

5 So, --

6 PRESIDING MEMBER MOORE: Well, and I  
7 understand that that's the reason that Dr. Fox  
8 took on some of the things that she did. But,  
9 we're now, --

10 MR. DANZIGER: Dr. Fox --

11 PRESIDING MEMBER MOORE: -- chewing  
12 into --

13 MR. DANZIGER: -- she was not the  
14 inventor of SCONOX.

15 PRESIDING MEMBER MOORE: She -- I'm  
16 sorry?

17 MR. DANZIGER: She was not the inventor  
18 of SCONOX, nor did she assemble the data. I did.

19 PRESIDING MEMBER MOORE: Well, I  
20 understand that, but I certainly think she's a  
21 credible witness and she certainly --

22 MR. DANZIGER: Yes, she certainly is.

23 PRESIDING MEMBER MOORE: -- stepped into  
24 the fray to answer what she could. So why don't  
25 we start by introduce your company and talk about

1        what they do and what is the product, itself, and  
2        where's your market today, who are you serving?

3                MR. DANZIGER:  Are you asking me?

4                PRESIDING MEMBER MOORE:  I'm asking you.

5                MR. DANZIGER:  SunLaw Energy Corporation  
6        is the parent company.  It has two portions.  It  
7        has GoalLine Environmental Technology and it has  
8        power generation and development arm.

9                We are actively involved in both areas.  
10       We have sold a number of environmental products in  
11       a number of different areas, as well as developing  
12       the Nueva Azalea project that I referred to  
13       earlier.

14               I'm not sure what you really want me to  
15       get into with that question.

16               PRESIDING MEMBER MOORE:  Well, we've  
17       heard some testimony about the preference for SCR  
18       versus using SCONox.  It's obviously based on some  
19       historical analysis.

20               MR. DANZIGER:  Yes.

21               PRESIDING MEMBER MOORE:  How did you  
22       come to -- why develop SCONox?

23               MR. DANZIGER:  Sure.

24               PRESIDING MEMBER MOORE:  And why is it  
25       fundamentally more expensive, if you will, than

1 SCR? Why -- and is there another alternative out  
2 there? I mean, why don't you address those for  
3 us?

4 MR. DANZIGER: Sure. My first  
5 experience with ammonia occurred when I was having  
6 lunch across the street from our plant in Los  
7 Angeles when we were developing the Federal and  
8 U.S. Growers Plants. The forklift operator, or  
9 something, pierced an ammonia line at a  
10 refrigerated warehouse across the street,  
11 whereupon an ammonia cloud enveloped a number of  
12 us causing panic, fear.

13 The hazardous materials unit of the  
14 Vernon Fire Department responded and addressed us  
15 behind their HAZMAT suits to find out how we were.  
16 We were all very scared.

17 Then about four months later, five  
18 months later, an anhydrous ammonia delivery man  
19 who was brand new on the job, first day on the  
20 job, clipped the wrong hose on the inlet or outlet  
21 or whatever he was delivering to, and another  
22 spill occurred. And I was there, and again panic  
23 ensued, people were very scared, we all thought  
24 that we were going to die. A few people were  
25 taken to the hospital. The area was evacuated.

1                   Those were very scary events. And I  
2                   knew at that moment that ammonia, without having  
3                   to do the studies I knew at that moment that  
4                   ammonia was a very bad thing.

5                   Subsequent to that time we were  
6                   developing a project called the U.S. Growers 2  
7                   project, which was -- we made a permit application  
8                   at South Coast Air Quality Management District.  
9                   At the end of the 180-day review period that South  
10                  Coast had, it was actually on the 179th day, they  
11                  made a BACT determination that SCR was BACT. Our  
12                  permit was the first permit that such a  
13                  determination was made on.

14                 We fought it, we fought it tooth and  
15                 nail. We were the lead on that because after all  
16                 it was our permit, it was our hearings, it was our  
17                 appeals, that the industry rallied behind.  
18                 Because we know exactly how the industry,  
19                 including some of the parties here today,  
20                 responded at that time.

21                 And we fought it because of secondary  
22                 particulate emissions in particular, as well as  
23                 the ammonia spill and other problems associated  
24                 with ammonia.

25                 After a period of time and we had our

1 engineers looking at it, and so forth and so on,  
2 after a period of time the South Coast, along with  
3 the EPA, determined that their position was not  
4 going to change, there was not a single gas  
5 turbine SCR operating in the United States. There  
6 was only one gas turbine and it was not operating  
7 at that time, it was in Japan at Japan National  
8 Railway. And yet they made that determination.

9           Because our proposed plant would be  
10 across and upwind of an elementary school, which  
11 children I am taking to Disneyland tomorrow, the  
12 poorest school in the L.A. City school system, we  
13 abandoned the project at a great cost to our  
14 company, great criticism from our shareholders,  
15 because of our great fear of ammonia. And also,  
16 we just simply weren't going to put in something  
17 that we felt was an environmental fraud, which I  
18 believe SCR is.

19           With respect, later on in looking at --  
20 and we were involved in the scale-up of many  
21 things, including gas turbines. We were involved  
22 in the LM6000. We were intimately involved in the  
23 Frame 7FA. Which the compressor section of which  
24 is a scale-up of the LM6000.

25           In the process of doing that we looked

1 at various combustors including dry low NOx  
2 combustors down to 9 ppm. We also looked at water  
3 injection as an alternative to -- massive water  
4 injection as an alternative to dry low NOx. And  
5 in the process of that we were able to get down as  
6 low as 9 ppm, and in one case 5 ppm, on water  
7 injection alone.

8 This had certain good things about it,  
9 but nevertheless, we were able to determine at  
10 that time that a 9 ppm Frame 7 sized engine or any  
11 engine using SCR would emit more pollutants than  
12 if you did nothing to the engine at all.

13 There's some argument here about whether  
14 secondary particulates will be formed at the Elk  
15 Hills facility. I don't know the Elk Hills  
16 facility that well to be able to say. Maybe it  
17 would, maybe it would not.

18 My understanding of the area is that  
19 secondary particulates would certainly be formed.  
20 And certainly at the Nueva Azalea project  
21 secondary particulates would be formed.

22 So that if you took the Frame 7FA  
23 without anything on it, no SCR, no SCONox, it  
24 would emit about 56 pounds an hour of NOx. If you  
25 put an SCR on it, going to 2 ppm, brings it down

1 to about 15, 16 pounds an hour of NOx. And  
2 between 70 and 100 pounds an hour of secondary  
3 particulates.

4 So by putting the SCR on, you don't  
5 reduce emissions at all. You transfer the  
6 emissions from a regulated pollutant to a  
7 nonregulated pollutant. Sounds a lot like MTBE to  
8 me.

9 And having actual notice of the dangers  
10 of ammonia, how could I sit in a courtroom and  
11 say, I didn't know ammonia was a problem? Having  
12 actual notice of the problems of ammonia, how  
13 could I ever put together a project that used  
14 SCR? As a power plant developer I simply  
15 could not.

16 Now, I'm the founder of the Los Angeles  
17 Power Producers Association, which some of the  
18 parties here were involved in at the same time.  
19 We've had a lot of discussions about this stuff  
20 through the years.

21 I'd like to read you one brief thing  
22 here which I've asked these folks about from time  
23 to time. In the December 1998 issue of "Power  
24 Plant Technology, Operations and Maintenance"  
25 magazine it is stated:

1                   There is little benefit from investing  
2                   in expensive plant modifications to bring NOx  
3                   levels down much further than the legal limit.  
4                   Most plant owners are interested in the cheapest  
5                   available technology which allows them to narrowly  
6                   avoid prosecution. Shocked philanthropists  
7                   reading this, sell your plant to someone who will  
8                   use it to make a profit, and go and join Green  
9                   Peace."

10                   As the head of the Los Angeles Power  
11                   Producers Association, I saw this attitude way too  
12                   often. I am shocked that these gentlemen never  
13                   asked the SCR vendors how low can you go. What  
14                   can you get me for another million dollars,  
15                   another half a million dollars. What can you get  
16                   me.

17                   They chose the cheapest available  
18                   technology, cheapest available SCR, cheapest  
19                   available anything. And I cannot, as a member of  
20                   the industry, sit by and say, hey, I'm going to do  
21                   SCR because I can get my plant permitted.

22                   That's the history, sir.

23                   PRESIDING MEMBER MOORE: Let me go to a  
24                   couple of questions, if I can, about issues that  
25                   Dr. Fox raised. She divided her comments into

1 three macro areas. One was SCONOx was technically  
2 feasible.

3 MR. DANZIGER: Um-hum.

4 PRESIDING MEMBER MOORE: Second, that it  
5 was scaleable. And finally, that it was  
6 commercially available.

7 And so let me just ask you to expound a  
8 little bit on a question which keeps coming up  
9 which is the scaleability. And so --

10 MR. DANZIGER: Yes, sir, with due  
11 deference to my colleague over here, I started my  
12 career in scale-up in 1979. My first assignment  
13 when I was working at Jet Propulsion Laboratory  
14 was looking at the scale-up of a fluidized bed  
15 coal combustor from 30 megawatts to 800 megawatts.

16 Subsequent to that time I've been  
17 involved in scale-up of gas turbines; scale-up of  
18 HRSGs, so forth and so on. And so when I was  
19 developing SCONOx I decided to scale down. We  
20 took coal-based technologies, damper technologies,  
21 and we scaled them down. We took technology and  
22 we scaled them down to our 30 megawatt  
23 application. We took former technologies and  
24 scaled them down.

25 PRESIDING MEMBER MOORE: I understand

1       that you did that.  But I want you to talk to me  
2       about scaling up.

3               MR. DANZIGER:  Well, what I'm saying is  
4       that the -- from where we are today, and we are  
5       going back a little bit to be able to scale up to  
6       even smaller than the original damper designs and  
7       other things that we looked at were larger than  
8       the Frame 7FA application we're talking about  
9       here.

10              So, we have no concern about scale-up  
11       whatsoever.  We see no evidence, after years of  
12       looking, that scale-up is going to be any issue at  
13       all here.

14              There is an option that the applicant  
15       has which is to take the system exactly the way it  
16       is right now, the EPA has said you can take --  
17       because it's a modular system that we have at  
18       Federal.  We did that intentionally so it would be  
19       easily scaled.

20              And you could take the system exactly  
21       the way it's designed today with no innovation  
22       whatsoever, duct the air as you see fit, and get  
23       the same results we're getting at the Federal  
24       plant today.  There is no technological reason  
25       that can't be done.

1           The applicants here, and others in the  
2           industry, seem to be taking the position that when  
3           you innovate that's the crime; innovation is the  
4           crime. And so we are attempting to do something a  
5           little innovative on the Nueva Azalea project, the  
6           Otay Mesa project, and ABB has put together a very  
7           interesting design which has innovation features  
8           to it which should make the system easier and  
9           cheaper and different things like that.

10           But right now you could take exactly  
11           what we have, duplicate it, and put it on this  
12           plant that the applicant has proposed. And they  
13           know that.

14           In terms of scale-up there is not a  
15           single component here that does not exist at much  
16           large scale. There's not a single system here  
17           which does not exist at larger scale under more  
18           rigorous conditions than we're proposing here.

19           PRESIDING MEMBER MOORE: Is there a  
20           SCONOX application for something in the range of  
21           300 to 400 megawatts out there?

22           MR. DANZIGER: No.

23           PRESIDING MEMBER MOORE: In Europe or  
24           anywhere else?

25           MR. DANZIGER: No.

1                   PRESIDING MEMBER MOORE: In terms of the  
2 point about commercially available, if I said  
3 could this be fitted up in the construction  
4 timetable that is indicated by the applicant for  
5 their project, would the parts be available in  
6 that timeframe?

7                   MR. DANZIGER: Yes.

8                   PRESIDING MEMBER MOORE: And are there,  
9 in your mind, any feasibility arguments,  
10 technical feasibility arguments that still have to  
11 be tested out and still need a field test before  
12 they're warrantable?

13                  MR. DANZIGER: No, sir. And the reason  
14 that I say that is the thing that we've learned,  
15 the one variable is regeneration gas flow  
16 distribution. Because what we learned in the last  
17 nine years -- ten years now we've been working  
18 with SCONOX, is that if you have good regeneration  
19 gas flow distribution, the catalyst works, things  
20 work just fine.

21                  That's one of the reasons we went to the  
22 modular approach, so we could duplicate that. But  
23 that is the one thing in every new design you're  
24 going to have to tweak, is the regeneration gas  
25 flow distribution. Not unlike the ammonia grid

1 stuff. But that is the one thing that will have,  
2 on every innovative design, that's the one thing  
3 that will have to be tweaked up.

4 PRESIDING MEMBER MOORE: Is there --  
5 SCONOx has been available for ten years?

6 MR. DANZIGER: No, no, the initial  
7 invention was about ten years ago. And we've been  
8 working on it ever since.

9 PRESIDING MEMBER MOORE: How long would  
10 you say it's been available in a commercial  
11 application where someone could have come to you  
12 and said, I've got a Frame 7F, and I'd like to  
13 have you fit it up with SCONOx? How long could I  
14 go backcast and say that capability's been  
15 available?

16 MR. DANZIGER: GoalLine's been prepared  
17 to do that for about three years.

18 PRESIDING MEMBER MOORE: Okay.

19 MR. OEGEMA: If I could interject right  
20 now.

21 PRESIDING MEMBER MOORE: Yes, go ahead.

22 MR. OEGEMA: I think there's some of the  
23 scale-up issues and the availability issues come  
24 into play because of ABB Alstom Power's  
25 involvement with SCONOx, with signing of the

1 license agreement for 100 megawatt and larger  
2 applications.

3 We signed the license agreement with  
4 GoalLine in September of '98 basically four large  
5 gas turbine applications, again in excess of 100  
6 megawatts.

7 Since that time, actually since prior to  
8 that time, since July of '98, we were working with  
9 GoalLine on the Genetics Institute project at that  
10 time, even prior to signing of the license  
11 agreement, to start learning the technology.

12 After we signed the license agreement we  
13 completed our work with the scale-up design. We  
14 worked with damper suppliers. We worked with our  
15 engineering people. We have structural engineers,  
16 mechanical engineers, electrical engineers on  
17 staff. We are in the business of designing and  
18 supplying air pollution control equipment to the  
19 industry.

20 And at the end of that design effort we  
21 now had a design on paper. We then took it to the  
22 next step where we undertook a verification  
23 program. And in that verification program we  
24 modeled things like regeneration gas distribution.  
25 Initially using computer models, and then on a

1 secondary basis, on a fine tuning, doing scale  
2 modeling, very similar to what is done on SCRs  
3 with ammonia injection systems, doing scale  
4 modeling.

5 This work has been completed. The  
6 damper test, we built a full-scale damper test,  
7 and cycled the damper for 100,000 cycles at an  
8 accelerated rate to check the reliability of the  
9 damper system.

10 PRESIDING MEMBER MOORE: Didn't Dr. Fox  
11 say 100,001 cycles?

12 MR. OEGEMA: Over 100,000 cycles.

13 (Laughter.)

14 MR. OEGEMA: The point here is that this  
15 program needed to be completed prior to us  
16 offering SCONox commercially. This was an  
17 internal program which our management required us  
18 to do. At the completion of this program,  
19 basically in December of '99, --

20 PRESIDING MEMBER MOORE: That's when the  
21 program ended?

22 MR. OEGEMA: Well, the program had ended  
23 before that. We then had corporate review, et  
24 cetera, and that's why in December of '99, over a  
25 year after we had signed the license agreement,

1 did we make the announcement that SCONOX was  
2 commercially available because of the work that  
3 we'd been doing since then. Since we signed the  
4 license agreement to the time we made SCONOX  
5 commercially available, the issue was the design  
6 verification program.

7 PRESIDING MEMBER MOORE: So, in reality,  
8 December '99, I mean this is emergent on the  
9 market right now, this is just literally  
10 available, as it were --

11 MR. DANZIGER: From ABB.

12 MR. OEGEMA: From ABB Alstom Power,  
13 correct.

14 PRESIDING MEMBER MOORE: -- very very  
15 recently.

16 MR. DANZIGER: Right.

17 PRESIDING MEMBER MOORE: Go back to the  
18 crossed figures that got debated here a little  
19 earlier, and that interests me quite a bit, where  
20 there was a great deal of discussion about why or  
21 whether or not bids had been asked for for SCONOX  
22 products.

23 And what I'm curious about is why in the  
24 case of a new emergent product with potentially 25  
25 to 30 plants out there that might be able to make

1 use of this, why would someone come to you and ask  
2 you for a bid? Why wouldn't you be going to them  
3 and literally laying a bid on their doorstep?

4 Or why wouldn't the Frame 7F people have  
5 a set of specs that when they marketed their  
6 product, even though I know there's a back-order  
7 for the Frame 7F's, they wouldn't have it next to  
8 it for the client to see? Why would they be  
9 coming to you for a bid? Why wouldn't your folks  
10 be at their doorstep handing them a bid? Or  
11 handing me one, saying, Commissioner, this is what  
12 the costs are. You ought to know this. Why  
13 aren't those costs out there?

14 MR. OEGEMA: Well, they are getting out  
15 there. We have made presentation to a number of  
16 people, to a number of buyers. We made a  
17 presentation to Sempra some months ago in San  
18 Diego. We are acting in that manner. We are  
19 contacting, we are doing presentations to these  
20 people.

21 MR. DANZIGER: If I could just interject  
22 briefly. ABB was under tremendous pressure from  
23 some of its biggest clients not to introduce  
24 SCONOx, specifically I don't know that he can  
25 address that, but specifically Power Systems

1       Engineering, which is El Paso, and -- Power  
2       Development Corporation, excuse me, and American  
3       National Power were their two biggest clients.

4               And one of the problems that they have  
5       faced, we've been told, is that GoalLine was  
6       providing proposals to people even if they didn't  
7       want them. And we received a lot of flak about  
8       that, to say the least.

9               We made presentations and presented  
10       various proposals to all sorts of folks, and that  
11       was not effective.

12              So ABB got stung pretty hard by some of  
13       the people out there, and they took the corporate  
14       position that they didn't want to lose sales in  
15       other areas by pushing SCONOx onto people who  
16       didn't request proposals.

17              And they were sort of forced into that  
18       position, in my view, anyway, because of the way  
19       the industry was solidly working to try to delay  
20       or avoid SCONOx.

21              PRESIDING MEMBER MOORE: Okay. What  
22       else in -- you've obviously seen the process. You  
23       know what I'm faced with in terms of making a  
24       decision about various components, of which this  
25       is only one of tens, involved in this case.

1                   What else, in terms of your proprietary  
2 products, should I know about them that hasn't  
3 already been introduced into evidence?

4                   MR. DANZIGER: Well, the only thing that  
5 off the top of my head I would add is that with  
6 respect to duct firing, that issue's been raised.  
7 SCONOx works better with duct firing. SCONOx has  
8 been deployed on industrial boilers now, and what  
9 we found is that as the lab results have shown  
10 consistently for the last several years, the lower  
11 the oxygen content the better SCONOx works. And  
12 so duct firing helps us, it doesn't hurt us.  
13 That's one thing I think you should be aware of.

14                   And also I think you should be aware of  
15 in your decision that innovation in this industry  
16 is extremely important. We have an industry that  
17 is growing out of a period where if something  
18 wasn't in the catalogue for 15 years, they didn't  
19 consider it available.

20                   It's very important, sir, that this  
21 industry start adopting some of the kinds of  
22 attitudes and approaches that the rest of our  
23 economy is taking, in terms of taking on new  
24 technology, trying things out.

25                   We have experienced just yesterday with

1 CARB, and certainly with EPA, Massachusetts  
2 Department of Environmental Protection, San Diego  
3 Air Pollution Control District, the South Coast  
4 Air Quality District, EPA Region 9, EPA Region 1,  
5 a tremendous amount of willingness to be flexible  
6 in the regulatory process to allow the first plant  
7 or two to have a real option to optimize without  
8 violating their program.

9 And so we're encouraged by that. And  
10 the fact is that when an applicant comes in and  
11 says, hey, we want to try to work this out, the  
12 proponents of Elk Hills have been in our plant  
13 dozens and dozens of times. We've never received  
14 any offer of help, we've never received any  
15 feedback from them.

16 If people -- if we were working together  
17 these problems could be solved in minutes.

18 PRESIDING MEMBER MOORE: Who makes the  
19 catalyst materials for you?

20 MR. DANZIGER: We do the coding. We  
21 have an agreement -- the principal portion of it  
22 is the substrate, which is the ceramic thing just  
23 like using SCR. That comes from a number of  
24 different suppliers, such as Corning and so forth.

25 Then there's a lumina layer which is a

1 washcoat. We can either do that ourselves, and we  
2 also have a manufacturing agreement with Sutkame,  
3 which is one of the largest chemical companies in  
4 the world, to manufacture that portion of it for  
5 us. We apply the platinum and potassium carbonate  
6 layers, ourselves, which is where the mostly  
7 proprietary --

8 PRESIDING MEMBER MOORE: Is it  
9 proprietary technology?

10 MR. DANZIGER: Yes, it is.

11 PRESIDING MEMBER MOORE: Patented?

12 MR. DANZIGER: Yes, sir. We did offer  
13 it to the industry very widely and we were turned  
14 down. I mean other people in the pollution  
15 control business, other people who are now  
16 developers and so forth, other equipment vendors.  
17 We did offer licenses to a number of different  
18 people, but they chose not to do that.

19 PRESIDING MEMBER MOORE: Do you run a  
20 training institute for people who would use your  
21 product so that their engineers can come and get  
22 trained?

23 MR. DANZIGER: Yes, sir, we've had the  
24 good fortune of training a number of different  
25 folks from Genetics Institute and now from San

1 Diego State University and L.A. International  
2 Airport, and the PG&E folks who are working on  
3 Otay Mesa spent a lot of time with us. And that's  
4 a very enjoyable part of the process.

5 PRESIDING MEMBER MOORE: I'll bet.  
6 Well, give me a sense of scale on the product,  
7 itself. I know what a Frame 7F looks like in  
8 terms of size. Can you use that as a reference  
9 point and tell me when your product is used in  
10 conjunction with it, what's the scale?

11 MR. DANZIGER: It's essentially the same  
12 size. It's a sliver of the HRSG. So if you've  
13 seen the HRSG, -- have you seen an SCR --

14 PRESIDING MEMBER MOORE: Yes.

15 MR. DANZIGER: We're just a little  
16 smaller than an SCR, and in the same location.

17 PRESIDING MEMBER MOORE: And in the same  
18 location?

19 MR. DANZIGER: Right.

20 PRESIDING MEMBER MOORE: Well, what else  
21 would you like to leave me with, other than --

22 MR. OEGEMA: I think there's also an  
23 issue of the commercial nature with the  
24 guarantees. There's been some discussion going on  
25 about what is offered, what is guaranteed. And we

1 are offering SCONOx, that's why the process took  
2 as long as it did, is because we were offering it  
3 with commercial guarantees.

4           Some of the issues that have come up  
5 with regards to preliminary positions with  
6 preliminary proposals, certainly on a preliminary  
7 proposal we would introduce some conditions that  
8 may not be consistent with final negotiated terms.  
9 This process is typical in the industry when you  
10 discuss terms.

11           Damages obviously need to be clarified,  
12 are there liquidated damages, how much are they  
13 going to be, those kind of things come into the  
14 discussions with the negotiation process of  
15 commercial guarantees. But we are certainly  
16 willing to negotiate those.

17           MR. DANZIGER: If I can just elaborate  
18 briefly on that point. The applicant's talked  
19 about some vendor would have to take consequential  
20 damages. In other words, lost profits, lost -- no  
21 one, no one takes -- no SCR vendor, nor do we at  
22 GoalLine take consequential damages, nor do we  
23 expect them.

24           One other thing I should say is we did,  
25 our U.S. Growers and Federal, SunLaw Cogeneration

1 Partners 1 was the very first project financing  
2 done for an independent cogeneration project in  
3 the United States, and I did that financing.

4 We did it at a time it was completely  
5 unknown in the industry. And what we did was we  
6 developed a system where the vendor took --  
7 because they wouldn't take consequential damages,  
8 either, then or now.

9 The vendor took a portion of the risk,  
10 the insurance company took a portion of the risk,  
11 we took a portion of the risk, the regulators took  
12 a portion of the risk, the banks took the lowest  
13 portion of the risk, of course. But we were able  
14 to, with almost nothing in the bank, I mean we  
15 were not a rich company. You know, our total  
16 capital when we started was \$10,000. And we were  
17 able to raise \$87 million for the first project,  
18 with several new technologies in it that had never  
19 been used before in commercial operations, by  
20 apportioning the risk in these ways.

21 And that's the same technique that we've  
22 proposed to use on Nueva Azalea.

23 PRESIDING MEMBER MOORE: Okay. Well,  
24 gentlemen, I thank you very much. I appreciate  
25 your comments, and I think in spite of not making

1 a prepared presentation, you're very lucid, and to  
2 the point. So I think I'm the better for it, and  
3 I appreciate your staying.

4 MS. POOLE: Commissioner, may I make a  
5 brief suggestion before you dismiss this? I think  
6 one issue that might be very helpful for you to  
7 hear in your decision-making capacity, if these  
8 gentlemen will address it, is the issue of the  
9 guarantees they're willing to provide for NOx and  
10 CO emission limits.

11 PRESIDING MEMBER MOORE: I thought he  
12 just did address that in the form of the  
13 warranties.

14 MR. DANZIGER: Are you asking what the  
15 actual levels are? Well, we have a slightly  
16 different position on this --

17 MR. OEGEMA: Yeah, as far as our  
18 standard guarantee there's been some discussion  
19 with Massachusetts going to a 2.0 on a one-hour  
20 averaging. And we have guaranteed that. We'll  
21 guarantee 2.0 on a one-hour averaging, as opposed  
22 to the 2.5.

23 MR. DANZIGER: We would guarantee 1.

24 PRESIDING MEMBER MOORE: 1.0?

25 MR. DANZIGER: 1.0, which is what we are

1       permitting Nueva Azalea at.

2               PRESIDING MEMBER MOORE:   And that's one-  
3       hour averaging?

4               MR. DANZIGER:   We would do that at 15  
5       minutes.   One of -- the averaging stuff is  
6       something that's poorly understood.   If you go  
7       back through all the data there was never an  
8       exceedance on a 15-minute basis, let alone a one-  
9       hour or three-hour.

10              That's, I don't know how that ended up  
11       being such a part of the discourse, but it's  
12       not -- SCONOX never exceeded on 15 minutes.   So a  
13       one-hour average doesn't help us.

14              PRESIDING MEMBER MOORE:   Well, that's  
15       important to know.   Thank you very much.  
16       Gentlemen, thank you.

17              All right, we're going to turn back now,  
18       and I think -- where am I?   We're going back to --

19              MS. POOLE:   I believe cross of Dr. Fox  
20       and Mr. Marcus.

21              PRESIDING MEMBER MOORE:   Right.   Thank  
22       you, Ms. Poole.   Okay, so --

23              MS. POOLE:   We could just skip that  
24       part.

25              PRESIDING MEMBER MOORE:   I don't know,

1 we'll see how far we get. All right. To the  
2 applicant, Mr. Miller, the floor is yours for  
3 cross-examination.

4 MS. POOLE: May I make a request. Mr.  
5 Marcus has family duties calling him. Could we do  
6 any cross of him first?

7 PRESIDING MEMBER MOORE: Can you do  
8 that?

9 MR. MILLER: We have no questions for  
10 Mr. Marcus.

11 MS. WILLIS: We also have no questions.

12 PRESIDING MEMBER MOORE: Mr. Marcus, it  
13 looks like one of those extraordinary days where  
14 you get to answer two questions, earn your pay,  
15 and --

16 MR. MILLER: And it took all day.

17 MR. MARCUS: It's been a pleasure.

18 PRESIDING MEMBER MOORE: There aren't  
19 many consulting gigs like this around. You'll  
20 want to remember this one. Good, you're  
21 dismissed. Drive carefully.

22 Mr. Miller.

23 MR. MILLER: Thank you. For Dr. Fox.

24 CROSS-EXAMINATION

25 BY MR. MILLER:

1           Q     I'd like to cover some preliminary  
2 matters and then ask just a few questions. With  
3 regard to your background, Dr. Fox, you have not  
4 at any point worked for an air regulatory agency,  
5 I believe that's correct?

6           A     Worked for a what?

7           Q     Air regulatory agency, an air pollution  
8 control district or EPA?

9           A     No, I have not.

10          Q     And you are not any of the following  
11 kinds of engineers, I'd just like confirmation of  
12 that: registered mechanical engineer, chemical  
13 engineer, civil engineer or process engineer, is  
14 that correct?

15          A     Correct.

16          Q     Have you ever been responsible for  
17 managing a power facility and been responsible for  
18 meeting emission limits?

19          A     Not a power facility, but other types.

20          Q     And you're not an atmospheric scientist,  
21 is that correct?

22          A     I consider atmospheric sciences to be  
23 within my area of expertise.

24          Q     Based upon your training, experience?

25          A     Training and experience, yes.

1           Q     I see.  Have you ever procured a bid for  
2     an SCR or a SCONOx installation?

3           A     Yes.

4           Q     For what facility?

5           A     I have secured bids for many SCR  
6     systems.

7           Q     On behalf of the owner?

8           A     No.

9           Q     Thank you.  Are you a member of any  
10    professional societies such as the American  
11    Institute of Chemical Engineers?

12          A     I'm a member of the American Chemical  
13    Society and the Air and Waste Management  
14    Association, among others.

15          Q     Thank you.  With regard to the -- there  
16    were three facilities you mentioned in your  
17    testimony that had previously installed SCONOx, I  
18    believe.  One of them was Genetics?

19          A     Yes.

20          Q     And I believe we can agree that's a 5  
21    megawatt facility?

22          A     Yes.

23          Q     And the other two were the L.A. Airport  
24    and San Diego State, I believe that's correct?

25          A     Yes.

1 Q And could you tell us the size of those  
2 facilities in terms of their megawatt output?

3 A I'm not sure I would get it right. I  
4 would defer to the gentlemen in the audience.

5 Q Do you believe they are less than 5?

6 A I don't know.

7 Q I'm being corrected. Those are  
8 facilities that you've stated financing had been  
9 obtained for, correct? And you don't know their  
10 size?

11 A Not as I sit here, no.

12 Q Do you think they're 170 megawatts?

13 A No.

14 Q Thank you.

15 MR. MILLER: May I have just one moment,  
16 please?

17 PRESIDING MEMBER MOORE: Yes.

18 MR. MILLER: We have no further  
19 questions for Dr. Fox.

20 PRESIDING MEMBER MOORE: Thank you.  
21 Staff?

22 MS. WILLIS: Yes, I just had a few  
23 questions.

24 CROSS-EXAMINATION

25 BY MS. WILLIS:

1           Q     Dr. Fox, you're aware that EPA commented  
2           on the San Joaquin Air District's preliminary  
3           determination of compliance for this project, is  
4           that correct?

5           A     I don't believe I have personally  
6           reviewed their comments, so, no.

7           Q     So you did not review the final  
8           determination of compliance that included the  
9           EPA's comments?

10          A     No, I did not completely review it.

11          Q     Okay. EPA has required the District to  
12          revise their top-down BACT analysis to  
13          specifically include SCONox, is that correct?

14          A     Yes.

15          Q     But EPA, and apparently, since you  
16          haven't reviewed the FDOC in complete, in their  
17          comment they did not require the District to  
18          change the District's determination of BACT for  
19          this project, is that also correct?

20          A     The EPA's request for a BACT analysis  
21          was with respect to --

22          Q     I'm sorry, that's not --

23          A     -- the PSD permit.

24          Q     I'm sorry, that's not the question. The  
25          question is on their comments on the PDOC did they

1 change BACT for the District, was the District  
2 required to change their BACT determination?

3 A I haven't reviewed them.

4 Q So you're not aware of what EPA's  
5 comments are on this case?

6 A No.

7 Q Okay, thank you.

8 MS. POOLE: Comments on the PDOC, is  
9 that correct?

10 DR. FOX: Comments on the PDOC, that's  
11 correct.

12 BY MS. WILLIS:

13 Q Well, that would be the only comments  
14 EPA has provided in this case, is that correct?

15 A No, that's not correct.

16 Q There are other comments other than --

17 MS. POOLE: There are several  
18 attachments to --

19 MS. WILLIS: I'm sorry, I'm asking the  
20 witness a question.

21 BY MS. WILLIS:

22 Q I'm just trying to establish that  
23 apparently you aren't aware of EPA's comments on  
24 the District's preliminary determination of  
25 compliance in this case regarding BACT, best

1 available control technology in this case?

2 A I did not review EPA's comments on the  
3 PDOC in this case. However, there are other EPA  
4 comments with respect to PSD with which I am  
5 familiar.

6 Q But not on this particular --

7 A Not on the PDOC, no.

8 Q Okay. Also, the La Paloma project you  
9 had mentioned that in your testimony. They're no  
10 longer proposing to use SCONOx, are they?

11 A No, they're not.

12 Q And also on the Nueva Azalea project,  
13 which you cite, too, they have not even been  
14 determined data adequate in this proceeding, have  
15 they?

16 A I'm not sure what the status of data  
17 adequacy is on Nueva Azalea.

18 MS. WILLIS: Thank you, that's all I  
19 have.

20 PRESIDING MEMBER MOORE: I'm sorry --  
21 Mr. Miller?

22 MR. MILLER: We have a short rebuttal  
23 testimony we'd like to present.

24 MS. POOLE: I have --

25 PRESIDING MEMBER MOORE: Well, before --

1 MS. POOLE: -- a couple little redirect.

2 MR. MILLER: Oh, I apologize, excuse me.

3 PRESIDING MEMBER MOORE: Yes.

4 REDIRECT EXAMINATION

5 BY MS. POOLE:

6 Q Dr. Fox, you have consulted for air  
7 regulatory agencies, correct?

8 A Yes.

9 Q Would you like to summarize your  
10 experience in the power industry?

11 A I may require a little coaching, it goes  
12 back so far.

13 But I originally started out working in  
14 the power industry in the early '60s.

15 MS. WILLIS: I'm going to ask that this  
16 be relevant to the questions that were asked --

17 MS. POOLE: Mr. Miller asked a series of  
18 questions about Dr. Fox's qualifications to  
19 testify --

20 PRESIDING MEMBER MOORE: Counsel, I'm  
21 going to allow it to come in. He was going at her  
22 qualifications, and I'll allow Ms. Poole to  
23 elaborate on those.

24 I think probably jobs is sufficient, Dr.  
25 Fox.

1 DR. FOX: Pardon?

2 PRESIDING MEMBER MOORE: Job titles --

3 DR. FOX: I'm not sure my memory is that  
4 good any more. But I'll try.

5 My experience goes back to the '60s when  
6 I worked for Bechtel Power at power plant  
7 construction sites in Florida where I worked in  
8 purchasing and accounts payable and receivable.

9 After that I worked at Florida Power &  
10 Light, actually running the administrative end of  
11 a large fuel-oil-fired power plant.

12 After that I came to California and  
13 started working for Bechtel. And a good portion  
14 of the time that I spent at Bechtel I spent  
15 working for Bechtel Power on the design of power  
16 plants and, among other things, I was the head of  
17 an internal Bechtel task force that was  
18 investigating erosion, corrosion type failures of  
19 power plants.

20 Subsequently I was involved in the  
21 Public Utilities Commission hearings on the then-  
22 proposed merger of San Diego Gas and Electric and  
23 Southern California Edison where I presented  
24 testimony on behalf of the IBEW and the Attorney  
25 General.

1                   And thereafter I have been involved in  
2                   regulatory activities and permitting of numerous  
3                   power plants, too many for me to remember.

4                   And I have also been involved in Energy  
5                   Commission proceedings on, I don't know, seven or  
6                   eight separate facilities.

7                   MS. POOLE: Thank you, I think we're all  
8                   done.

9                   PRESIDING MEMBER MOORE: Thank you. Any  
10                  recross?

11                  MR. MILLER: I have no questions, thank  
12                  you.

13                  PRESIDING MEMBER MOORE: All right. Let  
14                  me go back to staff. Did you have material that  
15                  you needed to get sponsored?

16                  MS. WILLIS: We do. I don't know, have  
17                  you been able to review this?

18                  MS. POOLE: I haven't. Since I was  
19                  given this we've been testifying, so I haven't had  
20                  a chance to look it over.

21                  PRESIDING MEMBER MOORE: We'll come back  
22                  to it.

23                  MS. WILLIS: Okay.

24                  PRESIDING MEMBER MOORE: And so let's  
25                  turn to Mr. Miller, and you have rebuttal?

1                   MR. MILLER: Yes. I don't think this  
2 will be terribly extensive; only take a few  
3 minutes.

4                   DIRECT EXAMINATION

5 BY MR. MILLER:

6                   Q I would like to ask a question  
7 generally, ask a question of Mr. Rowley to please  
8 comment on statements made in Dr. Fox's testimony  
9 regarding the scale-up issue, and in particular, I  
10 believe, the Stone and Webster report, and its  
11 implications.

12                  A Starting on page 11 of Dr. Fox's  
13 testimony it's stated that there are no scale-up  
14 issues. We've heard that repeatedly here, today,  
15 as well.

16                  On page 13 of the testimony there's a  
17 statement that scale-up is simply, and I'll quote,  
18 "Scale-up is simply not an issue for monolithic  
19 modular catalyst systems such as SCONOx and SCR.  
20 There is nothing anywhere in the technical  
21 literature to the contrary."

22                  That's quite a sweeping statement, and  
23 in fact, you actually need look no further than  
24 the ABB report -- actually the Stone and Webster  
25 report --

1 MS. POOLE: I'm sorry, can you please  
2 show me where you're reading on page 13?

3 MR. ROWLEY: Page 13, just above the  
4 number 2.

5 MS. POOLE: I see, okay, thank you.

6 MR. ROWLEY: We really need look no  
7 further than the Stone and Webster report done for  
8 ABB Alstom. The title of the report, which is  
9 appended to Fox's testimony, is, Independent  
10 Technical Review, SCONOX Technology and Design  
11 Review.

12 It was completed and published on  
13 February 22nd of this year, so it's very recent.

14 I think it would be helpful just to take  
15 a look at the objectives and scope of the study.  
16 These are found on page 2-1. The primary  
17 objectives of the study include provide an  
18 independent opinion of the technical viability of  
19 the process for the proposed applications with a  
20 maximum NOx emission of 2.5 ppmvd and a CO  
21 emission of 4.0 ppmvd, both corrected to 15  
22 percent O2.

23 Review full-scale system operation of  
24 low temperature, 28 megawatt, and high temperature  
25 applications, 5 megawatt. The low temperature

1 operation is primarily for retrofit applications,  
2 and high temperature operations is for new  
3 installations.

4 Review the system scale-up, KA-24  
5 reference plan documents. The KA-24 is ABB gas  
6 turbine, or combined cycle based on ABB GT-24.  
7 Review the various system modifications and  
8 improvements from the operating plants to the  
9 proposed reference plant. Identify potential  
10 areas of process modification and equipment  
11 systems improvement, if any, required to meet  
12 technical and financial due diligence criteria.

13 So, those are the objectives of the  
14 study. If we take a look at the results of the  
15 study, first on page 1-2 of the study. The second  
16 bullet on that page first makes reference to low  
17 temperature retrofit application. A 28-megawatt  
18 plant where the system is installed as a retrofit  
19 and operates in the temperature range of 300 to  
20 350 degrees was visited.

21 Goes on to describe the Federal  
22 facility, talks about the failure of a damper  
23 shaft, and sulfur poisoning of the SCONOX  
24 catalyst, which, quote, "for this application is  
25 being resolved by periodic water washing and

1 reactivation of the catalyst" close quote.

2           The next bullet on that page talks about  
3 the high temperature application and the Genetics  
4 facility on which it's based. High temperature  
5 new applications and KA-24 reference plant design.  
6 The KA-24 reference design is for a new 270  
7 megawatt combined cycle plant consisting of one  
8 ABB GT-24 gas turbine, one HRSG and one steam  
9 turbine. The SCONox system will operating in the  
10 temperature range of 600 to 700 degrees.

11           The system will be installed upstream of  
12 low pressure HRSG and treat turbine exhaust gas.  
13 The design inlet NOx concentration is 25 ppm, and  
14 the exit concentration 2.5 ppm, corrected to 15  
15 percent O2. There will be a SCONox catalyst  
16 system upstream of the SCONox system to remove  
17 sulfur based compounds in the flue gas.

18           The catalyst --

19           MS. POOLE: Mr. Rowley, may I interrupt  
20 you? How does this respond to anything that Dr.  
21 Fox has stated?

22           MR. ROWLEY: She made a reference to  
23 this, and I'm getting to the scale-up issues.

24           MS. POOLE: Okay, perhaps you don't have  
25 to read us all the way to it. Could you just

1 quote us the sections that you're concerned about  
2 in here?

3 MR. MILLER: If you would like to make  
4 an objection I would suggest you address it to the  
5 Chair.

6 PRESIDING MEMBER MOORE: Well, okay, I'm  
7 interpreting that as an objection. And I'll  
8 gently support it and say, Mr. Rowley, I  
9 understand where you're going, let's go there.

10 MR. ROWLEY: Okay. I'll just paraphrase  
11 then. It states that a system based on this  
12 design, it's referring to the referenced plant  
13 design, a system based on this design is installed  
14 at the Genetics Institute, 5 megawatts, it's been  
15 in operation since June '99.

16 Quote, "Several operational challenges  
17 have been experienced, and corrective measures and  
18 design modifications have been and are being  
19 implemented. These include, one, replacement of  
20 original metal seals with fiberglass steel-wool  
21 based tadpole design.

22 Two, installation of external reformer  
23 catalyst to produce regeneration gas. Three,  
24 installation of carbon filter upstream of the  
25 reformer catalyst, remove sulfur compounds from

1 the feed pipeline gas, which tend to deactivate  
2 the reformer catalyst.

3 And four, installation of a parallel  
4 reformer catalyst system to enable online catalyst  
5 washing to improve system reliability.

6 From this section of the report it's  
7 clear, first of all, that the new installation,  
8 the KA-24 reference plant design is based on the  
9 Genetics facility. The Genetics facility  
10 operates at 600 degrees.

11 The testimony of Dr. Fox suggests that  
12 the Federal plant is relevant, and that a catalyst  
13 will actually work better at 600 degrees than it  
14 does at 300 degrees.

15 The issue is not the absorption rate of  
16 the catalyst. The issue is the performance of the  
17 dampers, the performance of the seals, and the  
18 SCOSOx system.

19 There is no 600-degree application of  
20 the dampers and seals at the 28 megawatt facility  
21 at Federal. There is no SCOSOx system at Federal.  
22 These things are only found at the 5 megawatt  
23 facility at Genetics.

24 The only other test of the damper is at  
25 the higher temperature has occurred at the test

1 rig that ABB put together.

2 And if we go to page 1-4 of the Stone  
3 and Webster report, in the first bullet it states,  
4 damper seal and damper actuators are critical  
5 system components. Based on full-scale test  
6 results, that's the test rig, the seal design has  
7 been modified.

8 Full-scale testing of the new seal  
9 design has not been performed, but is planned in  
10 the near future. Both pneumatic and electric  
11 actuators will be tested to assess operational  
12 reliability.

13 So, when you take a look at the test  
14 results, the test results were not a success, they  
15 were really a failure. And the seal design had to  
16 be modified accordingly.

17 In fact, if we take a look at the  
18 detailed results, the detailed results are found  
19 starting on page 4-12. It talks about the tadpole  
20 seal design incorporating stainless steel encased  
21 in fiberglass cloth, and it was tested for this  
22 test rig.

23 They cycled the test rig for 100,001  
24 times. Now, if you do the math, there are four  
25 cycles in an hour, there are four cycles in an

1 hour both at Federal and at Genetics. If you do  
2 the math you'll find out that 100,001 cycles is  
3 less than three years. It's not the five-plus  
4 years that was talked about.

5 Also, the actuators and -- the  
6 actuators, quote, on page 4-15, "actuators  
7 presented numerous problems which resulted in  
8 several repairs and test interruptions after the  
9 completion of 60,000 cycles."

10 You do the math, 60,000 cycles is less  
11 than two years of operation. And this is in an  
12 ideal like situation, it's not an actual HRSG.

13 Quote, "Leakage tests conducted at the  
14 end of the program after approximately 100,001  
15 cycles show a significant increase in the leakage.  
16 Inspection showed that the seals at the lower  
17 chamber have failed at various places."

18 The system proposed for the KA-24 has  
19 2500 feet of seals. The KA-24 is similar to one  
20 of our two machines proposed for the Elk Hills  
21 project.

22 So for our project you'd be looking at  
23 5000 feet of these seals. The only test that  
24 they've done shows that the seals failed after  
25 cycles that are equivalent to less than three

1 years of operation.

2 Another important scale-up parameter, in  
3 fact it's been referenced both in my earlier  
4 testimony, as well as in Dr. Fox's testimony, is  
5 the distribution of regeneration gas.

6 The distribution of regeneration gas is  
7 a critical design parameter -- this is from the  
8 Stone and Webster report, quote: Regeneration gas  
9 flow distribution through the catalyst is an  
10 important process design parameter. The degree of  
11 regeneration, regeneration cycle time, and the  
12 amount of gas required for regeneration, hence  
13 process economics depend on this important  
14 parameter. Because of its process and economic  
15 significance, both computer and physical model  
16 studies were performed to improve and finalize the  
17 design.

18 If you take a look at the computer model  
19 results on page 4-19, the first bullet, first they  
20 tried to verify the model against the Federal and  
21 Genetics facilities. A normalized velocity of 1.0  
22 indicates uniform velocity. If it's higher than  
23 1.0 then it's going faster; lower, then it's going  
24 slower in that given portion of the catalyst  
25 chamber.

1           Quote: The velocities are between .8  
2           and 1.1 of the average velocity for the Federal  
3           design. That's pretty good, hovering around 1.  
4           And between .4 and 1.2 for the Genetics design.  
5           That's not as good, .4 to 1.2.

6           The corresponding values are .5 and 2.1  
7           for the original KA-24 design, and .3 and 1.5 for  
8           the KA-24 design with the distribution holes and  
9           reduced out the plenum length configuration 10.

10           So, they scaled it up in a computer  
11           model and it performed worse. So, that, by  
12           definition, is a scale-up issue. They were not,  
13           even in a computer model, able to replicate what  
14           they're getting at the smaller scale.

15           And then they tried changing the design  
16           with distribution holes and reduced out the plenum  
17           length, it got marginally better. But still, not  
18           as good of distribution as the smaller units.

19           Again, that, by definition, is a scale-  
20           up issue.

21           At the conclusion section of the  
22           computer modeling, conclusion number one, this is  
23           on page 4-21. Flow distribution is significantly  
24           worse for the baseline KA-24 design than for the  
25           Genetics and Federal designs. Modification of the

1 base design resulted in substantial improvements.  
2 Using the region under the catalyst modules as a  
3 distribution plenum, again this is the distributed  
4 design, provides improved distribution across the  
5 catalyst, but the distribution is still not as  
6 good as for the Federal and Genetics design.

7 The larger unit has poorer distribution  
8 for a parameter as described as a critical design  
9 parameter. It sounds to me like they still have  
10 work to do based on their own study.

11 Further, the bottom of -- conclusion  
12 number 2. The top to bottom distribution required  
13 improvement, and this was a primary objective for  
14 the scaled model study at NELS. The scaled model  
15 study is the physical model they made reference  
16 to.

17 They had a subcontractor build a one-  
18 sixth scale model of a typical shelf, it's this  
19 NELS is the name of the contractor. And the one  
20 parameter that they were concerned about in the  
21 computer modeling, the top to bottom distribution,  
22 and quote, this was a primary objective for the  
23 scaled model study at NELS to prove that, N-E-L-S.

24 The results of the study at NELS states,  
25 quote, -- this is at page 4-24, first bullet: The

1 gas distribution from top to bottom of the  
2 catalyst was not within the specified values.  
3 However, it was considered acceptable at this time  
4 and was a major improvement from the original non  
5 baffle design. It is thought that distribution  
6 could be improved by utilizing a larger scale  
7 model so that perforated baffles could be studied.

8 This is a one-sixth scale model in an  
9 ideal life situation. And they were not able to  
10 achieve the result they wanted. Instead they  
11 lowered their standard and declared victory  
12 basically.

13 So, those are some of the issues on  
14 scale-up that are talked about in the Stone and  
15 Webster report. I could go on, but I think you  
16 get the idea.

17 Some other points that I need to touch  
18 on just quickly. Dr. Fox referenced ammonia,  
19 ammonium salt, boiler deposition both in her  
20 testimony and her oral comments.

21 I've operated natural gas fired combined  
22 cycles with SCR. For natural gas only operation  
23 there is no such problem. That is a myth.

24 She alluded to 100 tons per year at Otay  
25 Mesa resulting in a lower annual emission, a lower

1 PPM level. In fact, the 100 tons per year number,  
2 when combined with the permit limit proposed by  
3 Otay Mesa, does not result in a lower ppm level,  
4 but rather in a lower plant capacity factor.

5 She objected to the three-year  
6 demonstration that has been talked about with  
7 regard to Otay Mesa, and I'll quote from their  
8 AFC. Quote: If after a three-year technology  
9 demonstration period it is determined that SCONOx  
10 cannot meet BACT, or if other technical problems  
11 indicate that SCONOx is not appropriate for this  
12 application, a conventional post-combustion SCR  
13 system, using 19.5 percent aqueous ammonia may be  
14 used to replace the SCONOx." Close quote.

15 There is talk about the guarantee  
16 offered by ABB Alstom to the EM1, or Nueva Azalea  
17 facility. I think I need only point out that if  
18 you take a look at the guarantee it's from ABB  
19 Alstom Power addressed to SunLaw Energy  
20 Corporation. This is an incestuous document. It  
21 is an internal document from the licensor of the  
22 technology to the licensee of the technology.

23 And who knows if this project will  
24 really go forward. I hope it does, because the  
25 technology needs to be demonstrated. I think it

1 has some promise. But, this guarantee has no  
2 meaning to the outside world. This a guarantee  
3 between a licensee and a licensor.

4 Dr. Fox talked about ammonia being  
5 explosive. I'm not aware of ammonia ever igniting  
6 or exploding in an HRSG. As soon as the ammonia  
7 is introduced into the HRSG, the concentration  
8 almost immediately descends to ppm levels. We're  
9 not talking percent levels, but ppm levels.

10 There is mention about the fact that 2.5  
11 ppm has not been achieved by a merchant plant. We  
12 know that 3.5 ppm has been achieved by large gas  
13 turbine merchant plant. And I'm much more  
14 comfortable going from 3.5 ppm to 2.5 ppm. That's  
15 not nearly the stretch as the scale-up from 5  
16 megawatts for SCONox to 170 megawatts.

17 Dr. Fox talked about leakage being not a  
18 concern with the SCONox dampers, and used the word  
19 infinitesimal. I think I need only point out that  
20 according to the Stone and Webster report the  
21 design criteria for leakage, in other words,  
22 acceptable, is not infinitesimal. It's 5 percent.  
23 5 percent of the regeneration gas flow.

24 There is kind of just waving away of the  
25 solution catalyst washing. Instead of using

1 SCOSOx in order to deal with the sulfur poisoning  
2 or the SCONOx catalyst, the catalyst washing is  
3 actually a recoating with potassium carbonate.  
4 This is not a trivial operation. It cannot be  
5 done on line.

6 In order for SCONOx to be commercially  
7 viable they need to get SCOSOx to work. And they  
8 need to demonstrate it.

9 Dr. Fox alleged that ABB offers a  
10 scrubber for SCOSOx. And she cited the Stone and  
11 Webster report, page 3-9. Page 3-9 does not say  
12 that ABB offers a scrubber. It says that they're  
13 trying to develop a scrubber.

14 And that concludes my rebuttal.

15 MR. MILLER: I have a few additional  
16 questions, three minutes.

17 PRESIDING MEMBER MOORE: These are  
18 questions on the rebuttal?

19 MR. MILLER: Yes.

20 PRESIDING MEMBER MOORE: All right.

21 BY MR. MILLER:

22 Q There was a reference in Dr. Fox's  
23 testimony to the need for oxygen to promote an  
24 explosion of the hydrogen that is in the  
25 atmosphere within the SCONOx equipment.

1                   What would be the result if the dampers  
2                   leaked as you've just indicated that they might,  
3                   or have in the past?

4                   A     If the dampers leaked and the hydrogen  
5                   was outside of its explosive limits, then nothing  
6                   would happen.

7                   If, as often happens in the real world,  
8                   things don't always perform exactly as you expect,  
9                   and instead of 2 percent hydrogen we have say 5  
10                  percent hydrogen and it's within its explosive  
11                  limit, then it need only contact something hot  
12                  enough to ignite it. And it could burn or  
13                  explode.

14                 Q     I believe she also testified that the  
15                  dampers that would be in the Elk Hills project, if  
16                  they were to be used there, are the very same  
17                  dampers that are used today at the Federal  
18                  facility. Could you comment on that?

19                 A     That is not possible because the Federal  
20                  facility operates at 300 degrees, and according to  
21                  ABB and Stone and Webster, the dampers that would  
22                  be offered for a large gas turbine would operate  
23                  at 600 to 700 degrees.

24                 That's a completely different operating  
25                  environment, different design, different

1 materials.

2 Q She also asserted that the only reliable  
3 data for a cost analysis would be presented,  
4 obtainable from the vendors. Could you comment on  
5 that?

6 A As noted by the ABB rep, Semptra did meet  
7 with SCONox. The data in our cost analysis is  
8 based on data from the ABB representative.

9 I think it's also worth mentioning that  
10 vendors like to sell their equipment. And  
11 generally tend to under-report the cost of the  
12 equipment. So you need to take a look at not only  
13 that bias that's inherent, but also look for  
14 integration costs that the individual equipment  
15 vendor is likely to overlook, either intentionally  
16 or accidentally.

17 Q Does ABB sell HRSGs as well as SCONox?

18 A Yes, they do, and I have purchased one.

19 Q And could you comment further just on  
20 the testimony by Mr. Marcus with regard to  
21 transportation costs and the purchase of natural  
22 gas?

23 A Mr. Marcus alleged that the natural gas  
24 purchase by the project was an affiliate  
25 transaction. In fact, it is an arm's length

1 relationship. It is not an affiliate transaction.

2 The fact that Sempra Energy Resources is  
3 a 50 percent partner in this project insures that  
4 it is an arm's length transaction. And the result  
5 of that is that we do pay a market price for  
6 natural gas; it's locational in nature; and either  
7 directly or indirectly reflects whatever it takes  
8 to get gas to that location, including  
9 transportation charges.

10 MR. MILLER: Thank you. I have one  
11 question for Mr. Abreu and then we'll be done.

12 DIRECT EXAMINATION

13 BY MR. MILLER:

14 Q There's been criticism lodged by Dr. Fox  
15 of the BACT analysis prepared by Three Mountain  
16 Project. Had you ever seen that analysis before  
17 you prepared yours?

18 A No, I did not. My analysis was prepared  
19 independently and before the Three Mountain  
20 analysis was prepared.

21 Q And so the purpose of your attaching it  
22 to your testimony was to provide confirmation of  
23 the independent analysis you prepared?

24 A Yes.

25 Q Had you ever seen the Towantic analysis

1 before you prepared your analysis?

2 A No, I had not.

3 MR. MILLER: Thank you. That concludes  
4 our rebuttal.

5 PRESIDING MEMBER MOORE: Staff, do you  
6 have questions on the rebuttal?

7 MS. WILLIS: No questions.

8 PRESIDING MEMBER MOORE: Ms. Poole, do  
9 you have questions?

10 MS. POOLE: Yes, a few. I believe  
11 they're all for Mr. Rowley.

12 CROSS-EXAMINATION

13 BY MS. POOLE:

14 Q Does the Stone and Webster report  
15 indicate that any of the, quote, "operational  
16 challenges" that you cited are insurmountable?

17 A No, I think the report is generally  
18 upbeat for the ability to ultimately overcome the  
19 challenges.

20 Q In fact, it states that, quote,  
21 "corrective measures and design modifications have  
22 been and are being implemented" unquote, correct?

23 A That's one the quotes that they made,  
24 and that's with regard to the 5 megawatt facility.

25 Q What was the emission limit that the

1       SCONox catalyst achieved when the modifications  
2       that you discussed were being made at Genetics?

3           A     Generally the report talks about a 2.5  
4       ppm number.

5           Q     Well, in fact, would it surprise you to  
6       learn that Genetics was achieving less than 2 ppm  
7       NOx during all those modifications?

8           MR. MILLER:  Is that your testimony,  
9       counsel?

10          MS. POOLE:  No, I'm asking the witness  
11       if it would surprise him to learn that.

12          MR. ROWLEY:  If I could find the  
13       specific site in here, I think we will learn  
14       otherwise.

15                 This is on page 1-2, quote, "Because of  
16       the above system modifications and turbine  
17       operation which frequently increased the NOx  
18       concentration above the design value of 25 ppm by  
19       80 percent to 100 percent, this system could not  
20       maintain an outlet concentration of 2.5 ppm on a  
21       continuous basis" close quote.

22                 So, due to two factors the system  
23       modifications and problems with the gas turbine,  
24       it could not maintain the 2.5.

25       BY MS. POOLE:

1           Q     And it doesn't clarify whether that was  
2           because of the turbine problems, or because of the  
3           system modifications, does it?

4           A     It uses the word and.  Because of the  
5           above system modifications and turbine operation,  
6           and so forth, the system could not maintain.  So  
7           it was due to both.

8           Q     But, in fact, you don't know whether the  
9           system modifications alone caused the Genetics  
10          facility to exceed its outlet concentration?

11          A     It says what it says.  It says it was  
12          due to both --

13          Q     I'm asking you what you know.

14          A     I know what --

15          Q     Do you know --

16          A     -- the words are on this page.

17          Q     Okay.  So you do not know whether either  
18          one of these factors alone caused the Genetics  
19          facility to exceed the outlet concentration?

20          A     I think I answered that.  What I know is  
21          what is written here.

22          Q     Does the Stone and Webster report  
23          conclude that any emission limits are not or  
24          cannot be met under the modeled space velocity  
25          issue which you discussed?

1           A     I never mentioned space velocities.

2           Q     Well, the issues that you discussed, I  
3     may be mischaracterizing it, I'm not a technical  
4     expert. The issues that you discussed about the  
5     range around 1.

6           A     That has to do with flow distribution of  
7     the regeneration gas.

8           Q     Okay. Did the Stone and Webster report  
9     conclude that emission limits are not or cannot be  
10    met under the modeled regeneration gas issues that  
11    you discussed?

12          A     I think that the Stone and Webster  
13    conclusion is similar to mine. The conclusion is  
14    that they believe that it can be surmounted. But  
15    clearly the results indicate that it has not been  
16    to date.

17          Q     Did it conclude that any emission limits  
18    could not be achieved because of those issues?

19          A     That portion of the report had to do  
20    with flow distribution and did not -- it has to do  
21    with the regeneration part of the cycle, not the  
22    absorption part of the cycle.

23          Q     So it does not conclude that any  
24    emission limits are not or cannot be met because  
25    of that issue?

1           A     That would be true because that is not  
2           logically connected to the achievement of NOx  
3           levels.

4           Q     Thank you.  Is a 100 tons per year  
5           annual limit on NOx a lower emission limit than a  
6           140-plus tons per year emission limit on NOx?

7           A     One hundred is lower than 140, but in  
8           terms of an emission limit, we expect that our  
9           emission rates will be governed on an hourly and  
10          daily basis.  And that we need to acquire emission  
11          offsets in order to offset annual emissions.  And  
12          we have fully offset the emissions.

13          Q     What are you offsetting, on an annual or  
14          hourly basis?

15          A     I would defer to someone who is more  
16          familiar with the District offset rule.

17                  MR. ABREU:  The offset requirement for  
18          San Joaquin and the federal offset requirement is  
19          an annual offset requirement; the offsets will be  
20          provided on a quarterly basis in accordance with  
21          the San Joaquin provisions.

22                  MS. POOLE:  And they're based on the  
23          annual NOx limit for NOx?

24                  MR. MILLER:  Excuse me, we're going  
25          beyond the scope of the direct.

1 MS. POOLE: No, we're not. Mr. Rowley  
2 specifically stated that a 100 ton per year  
3 emission limit for Otay Mesa was not less than  
4 what was required for this project.

5 MR. MILLER: He did not state that. He  
6 stated that it would affect the operating capacity  
7 of the project, rather than the emission  
8 limitation and concentration limit of 2 ppm.

9 MS. POOLE: Well, in fact, I disagree.  
10 I think he stated that it was --

11 MR. ROWLEY: I never mentioned --

12 MS. POOLE: -- not a lower emission  
13 limit because --

14 MR. ROWLEY: I never mentioned Elk Hills  
15 as --

16 HEARING OFFICER WILLIAMS: Counsel, I'm  
17 going to sustain the objection.

18 BY MS. POOLE:

19 Q Have you asked ABB or GoalLine whether  
20 the Federal facility design would be available for  
21 the Elk Hills project?

22 MR. ROWLEY: My information on the  
23 federal design is based on the Stone and Webster  
24 report. I have not asked them outside of the  
25 Stone and Webster report.

1 MS. POOLE: I believe that you stated  
2 that the ABB/SunLaw guarantee is meaningless --  
3 I'm not sure if that was your word, but --

4 MR. ROWLEY: Incestuous, I think is the  
5 word I used.

6 MS. POOLE: Incestuous. And not  
7 available to other developers because of the  
8 licensor and licensee relationship, is that right?

9 MR. ROWLEY: Not available is not what I  
10 said. It's not meaningful because of the dollar  
11 relationship between these two parties.

12 MS. POOLE: So do you think SunLaw is  
13 getting a better deal than others would get  
14 because of the relationship between the parties?

15 MR. ROWLEY: I'm simply saying that  
16 because of the licensee/licensor relationship  
17 that's a financial relationship. And a financial  
18 relationship that's not above board, you can't see  
19 it. All we can see is the portion that deals with  
20 the guarantee.

21 When you have an iceberg where you have  
22 just the tip showing up, which is these two pages,  
23 and the rest of the iceberg is the contractual  
24 relationship between the two parties, you're not  
25 getting the whole story.

1 MS. POOLE: What does the licensee/  
2 licensor relationship have to do with that?

3 MR. ROWLEY: It has everything to do  
4 with that, because guarantees are about money.

5 MS. POOLE: And what you are implying is  
6 that SunLaw is getting a better deal from ABB  
7 because of that licensor/licensee relationship,  
8 correct?

9 MR. ROWLEY: It's certainly possible,  
10 but we will never know. That's also true.

11 MS. POOLE: But that is your opinion?

12 MR. ROWLEY: I think it's a fact that  
13 this is a licensee/licensor relationship.

14 MS. POOLE: But, Mr. Rowley, you took  
15 that a little further and you stated that that  
16 discredited the Nueva Azalea guarantee somehow.  
17 I'm trying to understand your concern about that  
18 guarantee is because you think that they're  
19 getting a different deal because of the licensor/  
20 licensee relationship, correct?

21 MR. ROWLEY: I think that's true on the  
22 face of it, yes.

23 MS. POOLE: But you don't think a  
24 relationship where one party owns 50 percent of  
25 the other party would create the opportunity for a

1 party to get a better deal?

2 MR. ROWLEY: If you're referring to the  
3 Elk Hills project, there is no one party owning 50  
4 percent of the other party. I'm not sure what  
5 you're getting at there.

6 I mean, from my perspective, from Sempra  
7 Energy Resources' perspective, we are a 50 percent  
8 equity participant in the project. No one owns us  
9 except the Sempra parent company.

10 MS. POOLE: Are you here on behalf of  
11 Sempra or on behalf of the Elk Hills project?

12 MR. ROWLEY: As stated in my  
13 qualifications, I'm here in both regards. I'm the  
14 Director of Project Development for Sempra Energy  
15 Resources; I'm also an Officer of Elk Hills Power.

16 I'm also directly involved in  
17 negotiation of the fuel supply for the project.  
18 And I can tell you that my testimony is that that  
19 is an arm's length transaction.

20 MS. POOLE: Who owns the other half of  
21 the Elk Hills Power Company?

22 MR. ROWLEY: The other half is owned by  
23 Occidental Energy Ventures Corp.

24 MS. POOLE: And the natural gas supplier  
25 for the project will be Occidental, correct?

1                   MR. ROWLEY: That's true, but in the  
2 relationship, Sempra is the one that's negotiating  
3 the fuel supply, not Occidental Energy Ventures.

4                   MS. POOLE: You heard ABB and GoalLine  
5 comment on their guarantees?

6                   MR. ROWLEY: I need to clarify that the  
7 fuel supply is not coming from Occidental Energy  
8 Ventures, but rather an affiliate of Occidental  
9 Energy Ventures, which is Occidental Energy  
10 Marketing, Inc.

11                  MS. POOLE: Which is a subsidiary of  
12 Occidental Energy Ventures?

13                  MR. ROWLEY: No, it's an affiliate, but  
14 it's not a subsidiary.

15                  MS. POOLE: You heard ABB and GoalLine  
16 comment on their guarantees --

17                  MS. WILLIS: I'm going to object to  
18 that. We weren't allowed to cross-examine the  
19 representatives from ABB and GoalLine.

20                  MS. POOLE: I'm not cross-examining the  
21 representatives from ABB and --

22                  MS. WILLIS: No, but you're pointing out  
23 a comment that were just made as though -- and  
24 you're going to ask Mr. Rowley to comment on  
25 those.

1 MS. POOLE: Yes, I was.

2 MS. WILLIS: Those are not testimony in  
3 this case. They're comment.

4 MS. POOLE: So? That doesn't mean Mr.  
5 Rowley can't address them.

6 PRESIDING MEMBER MOORE: Well, --

7 MS. WILLIS: They're not part of  
8 testimony at this point.

9 PRESIDING MEMBER MOORE: -- let's --  
10 actually, --

11 MR. MILLER: This is cross on his  
12 rebuttal.

13 PRESIDING MEMBER MOORE: -- hang on.  
14 That's correct. And, so let's keep questions to  
15 the rebut, and when the opportunity comes back the  
16 other way, I'll make it the same thing.

17 So let's only question on the actual  
18 rebuttal offered by Mr. Rowley.

19 MS. POOLE: All right, well, this did  
20 have to go to Mr. Rowley's characterization of the  
21 relationship as incestuous.

22 PRESIDING MEMBER MOORE: Well, you know,  
23 I'm going to take responsibility for that, because  
24 I should have stepped in and called him on that.  
25 It was probably as improper as some of the other

1        comments that were made, and so I'm expunging it  
2        from my mind. Bad word. And we won't use it  
3        anymore.

4        BY MS. POOLE:

5                Q        Do you think that the guarantee that ABB  
6        or GoalLine would offer the Elk Hills project  
7        would be meaningless?

8                MR. ROWLEY: I already testified to that  
9        in my direct testimony. I gave specific reasons  
10       for the guarantee of an undemonstrated technology  
11       not being particularly meaningful for a merchant  
12       power plant.

13               MS. POOLE: I have no more questions.

14               PRESIDING MEMBER MOORE: All right, let  
15       me do just a bit of housekeeping. I said that we  
16       would try and go straight through tonight because  
17       I think I'm -- I'm trying to make sure that  
18       everyone gets the 30th back if we can hold to  
19       that. That's the reason I've been trying to go  
20       all the way through.

21               Now, my question to all of you is would  
22       you prefer to -- I'm going to turn to Ms. Poole  
23       and ask her if she has rebuttal testimony. I'm  
24       assuming that she probably does.

25               MR. MILLER: Pardon me, I don't think

1           there's rebuttal on rebuttal.

2                       PRESIDING MEMBER MOORE:  No, no, but I  
3           think that there's the opportunity to rebut what  
4           was said in the main testimony.

5                       MR. MILLER:  But that's already been  
6           done.

7                       HEARING OFFICER WILLIAMS:  No, I think  
8           what we're talking --

9                       MR. MILLER:  Two hours of rebuttal.

10                      HEARING OFFICER WILLIAMS:  -- what we're  
11          talking about is surrebuttal, and it has to do  
12          with the particular issue that was addressed  
13          concerning the scale-up.  And the Committee  
14          certainly has the discretion to allow that  
15          surrebuttal in the interest of fact finding.

16                      So, that's the ruling.

17                      MS. POOLE:  Thank you, we'd appreciate  
18          that opportunity.

19                      PRESIDING MEMBER MOORE:  Well, let me  
20          just ask this.  Considering that there's probably  
21          a fair amount of discussion that's still in front  
22          of us, would you like to keep going, or would you  
23          like to take a dinner break?  What's your  
24          pleasure?

25                      MR. MILLER:  We would certainly agree

1 that we should finish today. And --

2 PRESIDING MEMBER MOORE: Well, that's  
3 before midnight, it's still technically today.

4 MR. MILLER: We don't have really I  
5 don't believe anything further to offer in terms  
6 of testimony. We trust that this second crack at  
7 rebuttal, which there was already two or three  
8 hours of it from Dr. Fox earlier would be limited  
9 in some manner or another.

10 HEARING OFFICER WILLIAMS: I understand,  
11 counsel. I think clearly that surrebuttal will be  
12 limited to the issue of scale-up. That was  
13 brought up in Mr. Rowley's testimony on rebuttal.

14 MR. MILLER: We would be happy -- to  
15 come back to your question, sir, we would be happy  
16 to proceed without dinner. We might want to, I  
17 mean at least for awhile -- I guess the question -  
18 -

19 PRESIDING MEMBER MOORE: That's a  
20 qualified answer.

21 MR. MILLER: Well, I don't know -- it  
22 shouldn't take, actually, too much longer. We  
23 have some additional commenters that have not  
24 yet --

25 PRESIDING MEMBER MOORE: I understand

1           that.

2                   MR. MILLER:  So, if staff --

3                   MS. WILLIS:  Yeah, we just also want to  
4           remind that we also have alternatives section.

5                   PRESIDING MEMBER MOORE:  And I  
6           understand that.

7                   MS. WILLIS:  I don't know if Ms. Poole  
8           will have any questions.

9                   MS. POOLE:  I don't believe we do.

10                  MS. WILLIS:  Because maybe we could just  
11          do that by, you know, stipulation or --

12                  PRESIDING MEMBER MOORE:  Acclamation.

13                  MS. WILLIS:  -- acclamation.

14                  PRESIDING MEMBER MOORE:  All right, no,  
15          I do understand that we have alternatives to go,  
16          and I do understand that there are other people  
17          who would like to comment.  So, I'm sensitive to  
18          that.

19                  So, what's your pleasure?  Ms. Poole?

20                  MS. POOLE:  We would also prefer, I  
21          think, to keep going.

22                  PRESIDING MEMBER MOORE:  You have to  
23          move your car.

24                  MS. POOLE:  We'd like to keep going for  
25          awhile, but I was going to suggest that we take a

1 short break anyway so we can review this modified  
2 air quality condition --

3 PRESIDING MEMBER MOORE: That's a good  
4 idea. All right, let's take ten minutes. We'll  
5 come back at 15 till. We're off the record.

6 (Brief recess.)

7 PRESIDING MEMBER MOORE: Good evening,  
8 we're back on the record, and I'm going to turn it  
9 back to staff.

10 MS. WILLIS: Okay, I think we're going  
11 to need to swear Mr. Golden in just to sponsor  
12 this one document.

13 Whereupon,

14 KEITH GOLDEN  
15 was called as a witness herein and after first  
16 being duly sworn, was examined and testified as  
17 follows:

18 DIRECT EXAMINATION

19 BY MS. WILLIS:

20 Q Mr. Golden, could you state your name  
21 for the record?

22 A My name is Keith Golden.

23 Q And what is your job title?

24 A My title is Senior Mechanical Engineer.

25 Q And at the Energy Commission, what is --

1 your job responsibilities are?

2 A I oversee technical staff, air quality  
3 technical staff in the air quality unit of the  
4 Environmental Protection Office.

5 Q And tonight you are going to be  
6 sponsoring a change to one of the conditions of  
7 certification, is that correct?

8 A That's correct.

9 Q And can you state the title of that  
10 condition?

11 A It is condition AQ-C2.

12 Q And just for the record I think all  
13 parties have a copy of that change?

14 A Yes.

15 Q Is there any --

16 PRESIDING MEMBER MOORE: Let me ask if  
17 there's any objection to this? Is there any  
18 objection on the part of any party, applicant, to  
19 this condition?

20 MR. MILLER: No objection.

21 PRESIDING MEMBER MOORE: The  
22 intervenors?

23 MS. POOLE: No objection.

24 PRESIDING MEMBER MOORE: No objection.

25 All right.

1 MS. WILLIS: Do we need to mark that as  
2 a different number?

3 HEARING OFFICER WILLIAMS: You just want  
4 to make it part of the FSA, 19D, I think --

5 MS. WILLIS: We'll go ahead and make  
6 that part of the FSA exhibit 19D, and we'd like to  
7 move that into the record.

8 PRESIDING MEMBER MOORE: So moved.

9 MS. WILLIS: Okay, thank you.

10 MR. GOLDEN: Thank you.

11 PRESIDING MEMBER MOORE: Thank you for  
12 your contribution.

13 All right, let's turn back then, and I  
14 have offered a limited opportunity for rebuttal to  
15 Ms. Poole, who's looking anxiously for her  
16 witness.

17 MS. POOLE: For my witness.

18 PRESIDING MEMBER MOORE: Welcome back,  
19 Dr. Fox. And let me just say we're going to  
20 entertain rebuttal comments on the scaleability  
21 issue. And you have the floor.

22 MR. MILLER: Could I ask one quick  
23 question? Is the scaleability issue relates to  
24 the scope of scaleability as addressed by Mr.  
25 Rowley in his rebuttal testimony, is that correct?

1 HEARING OFFICER WILLIAMS: That's  
2 correct.

3 MR. MILLER: Thank you.

4 DR. FOX: Am I limited to just that one  
5 narrow issue?

6 HEARING OFFICER WILLIAMS: Yes.

7 DIRECT EXAMINATION

8 DR. FOX: I think Mr. Rowley started out  
9 his scaleability dialogue by quoting from my  
10 testimony, in which I stated that there was no  
11 information available that would suggest that a  
12 quote, "monolithic catalyst" had a scale-up  
13 problem.

14 And then Mr. Rowley went on to present  
15 testimony not on monolithic catalysts, but on some  
16 of the mechanical interface parts of the SCONOx  
17 system, which is not what my testimony addressed.

18 Mr. Rowley then followed that by a  
19 discussion of two scale-up issues which he alleges  
20 is supported by the Stone and Webster report. The  
21 first one is seal failure. And he stated that  
22 there was some 4000 feet of these seals in a  
23 SCONOx facility that would be installed on the Elk  
24 Hills plant, and cited failure information in the  
25 Stone and Webster report.

1                   In fact, the Stone and Webster report  
2                   found that the seals failed after greater than  
3                   75,000 cycles. 75,000 cycles corresponds to about  
4                   four years of operation in a compressed three-  
5                   month period of time. So they saw more severe  
6                   service than you would expect to see in practice.

7                   But the most important thing to  
8                   recognize is that most of the components in a  
9                   power plant have a warranty life for three years  
10                  and under.

11                  For example, the components of a typical  
12                  combustor are warrantied for from one to three  
13                  years. On wearable components like dampers and  
14                  seals and actuators, it is common, it is typical  
15                  that their lifetime is no more than one to three  
16                  years.

17                  So the fact that there were failure  
18                  problems with the seals after four years of  
19                  service is no big deal. This is typical service  
20                  life for components that you find in the power  
21                  industry.

22                  You normally get a warranty which  
23                  requires replacement of parts after a fixed  
24                  period, which is on that order. So this is  
25                  basically a nonissue, again.

1           The second point that he raised was the  
2           distribution of gases. And in his discussion of  
3           the distribution of gases he cited a number of  
4           ranges of flows from like .5 to 2.5, and argued  
5           that if the distribution was proper the number  
6           would be 1. And for it to be acceptable it had to  
7           hover narrowly around that 1. And the further  
8           apart the limits got the less acceptable the  
9           distribution was.

10           Well, there are some misleading things  
11           about that testimony, and let me just start by  
12           explaining to you what ABB's process is for  
13           scaling up a technology.

14           There are basically two steps that are  
15           used. The first step is computer modeling.  
16           Computer modeling, by its nature, is inaccurate,  
17           but it's quicker and cheaper. And computer  
18           modeling is no better than the assumptions that go  
19           into it.

20           And the way ABB normally does their  
21           scale-up work is they will develop a computer  
22           model and tweak it. And after they get it  
23           tweaked, they will use the results of the computer  
24           modeling to make design changes. And then they  
25           will go to a physical scale model. And the

1 physical scale model is then used as a basis for  
2 design.

3 The numbers that Mr. Rowley was quoting  
4 are the results of preliminary computer modeling.  
5 That was followed by scale-up modeling in which  
6 the numbers hovered close to 1. And all of those  
7 comments are irrelevant anyway. It's not really  
8 part of scale-up, it's part of design.

9 I mean you use this modeling physical  
10 model process to develop design parameters for the  
11 SCONOX system, or for other pollution control  
12 devices. The fact that there was a wide range in  
13 the numbers around 1 in preliminary computer  
14 modeling doesn't really mean anything. I mean  
15 that process is always used in preliminary scale-  
16 up studies like this one, and also subsequently in  
17 the design of the final plan.

18 And then finally it's important to  
19 realize that all of the studies that are described  
20 in the Stone and Webster report were part of the  
21 ABB scale-up program. And based on the ABB scale-  
22 up program, they tweaked the design and modified  
23 things that were found to not work quite the way  
24 they wanted it to, to come up with a final design  
25 which they are now marketing as their commercial

1 product.

2           It's important to keep in mind that that  
3 Stone and Webster report documents part of the ABB  
4 in-house scale-up program. It doesn't mean that  
5 if you take the technology and install it on a  
6 Frame 7FA that you're going to have scale-up  
7 problems reflected in gas distribution issues or  
8 seal failure. That's not what that report is.

9           I mean the way this process worked is  
10 ABB did the initial scale-up design, ABB did the  
11 damper testing, ABB did a large number of gas  
12 distribution studies, physical modeling, and then  
13 they gave the results of their work to ABB, who  
14 then reviewed it. This was all part of the normal  
15 ABB process that resulted in the commercial system  
16 which they now allege has no scale-up issues.

17 BY MS. POOLE:

18           Q     Dr. Fox, do you mean that they gave --  
19 ABB gave its work, after it did the test, to Stone  
20 and Webster?

21           A     Yes, that's how it worked. So, in  
22 summary, the regeneration modeling was really part  
23 of tweaking of the operation of the system for  
24 purposes of design.

25           The regeneration modeling is really not

1 a scale-up issue. And it's certainly not a  
2 monolithic catalyst scale-up issue.

3 Q Does that conclude your surrebuttal?

4 A That's all I'm allowed, yes.

5 PRESIDING MEMBER MOORE: Thank you. Are  
6 there questions, applicant?

7 MR. MILLER: No questions, thank you.

8 PRESIDING MEMBER MOORE: Staff,

9 questions?

10 MS. WILLIS: No questions.

11 HEARING OFFICER WILLIAMS: All right,  
12 thank you.

13 Let me turn to other matters then and  
14 ask first, on the question of the alternatives,  
15 should we deal with that?

16 MR. MILLER: I believe we had a short  
17 colloquy before the break that we might be able to  
18 dispose of that by stipulation submittal, if  
19 that's agreeable.

20 PRESIDING MEMBER MOORE: I'm prepared to  
21 accept such a stipulation, if everyone's prepared  
22 to say that they understand what it would be, and  
23 that the alternatives are as submitted.

24 If there's comments then this is the  
25 time to take them.

1 MS. POOLE: Well, I assume we're  
2 stipulating that the testimony that Mr. Pryor has  
3 provided is, in fact, his testimony.

4 MS. WILLIS: We can go through the few  
5 questions if you'd like, just to lay the  
6 foundation for the testimony.

7 PRESIDING MEMBER MOORE: Happy to. Mr.  
8 Pryor, who has waited patiently, let's do that and  
9 get this over with.

10 Yes, all right, excuse me. I should  
11 formally close the record now on air quality,  
12 which I will do. That does not mean we won't  
13 entertain comments at the end, but the record is  
14 now closed, and we will now turn back to counsel.  
15 Ms. Luckhardt takes the chair.

16 MS. LUCKHARDT: I don't need much, this  
17 won't take but a moment. Mr. Rowley has already  
18 been sworn.

19 Whereupon,

20 JOSEPH ROWLEY  
21 was recalled as a witness herein and having been  
22 previously duly sworn, was examined and testified  
23 further as follows:

24 DIRECT EXAMINATION

25 BY MS. LUCKHARDT:

1           Q     Mr. Rowley, please state your name -- we  
2 all know who you are. We won't continue with  
3 that.

4           MS. POOLE: I'm sorry, I missed  
5 something. I thought we were going to staff on --

6           PRESIDING MEMBER MOORE: Yeah, actually,  
7 I --

8           MS. LUCKHARDT: Do you want to start  
9 with staff first?

10          PRESIDING MEMBER MOORE: Could I please?

11          MS. LUCKHARDT: That's fine. We also  
12 have alternatives testimony that we need to enter.

13          PRESIDING MEMBER MOORE: I understand,  
14 but I'd like to just start with staff. I couldn't  
15 figure out where you were headed, so I thought you  
16 were -- never mind. We're going to start with  
17 staff. Thank you. Counsel.

18 Whereupon,

19                               MARC PRYOR

20 was recalled as a witness herein and having been  
21 previously duly sworn, was examined and testified  
22 further as follows:

23                               DIRECT EXAMINATION

24 BY MS. WILLIS:

25           Q     Mr. Pryor, could you please state your

1 name for the record.

2 A My name is Marc Pryor.

3 Q And you have been previously sworn in  
4 this hearing?

5 A Yes.

6 Q And your qualifications have been  
7 included in the FSA part 1?

8 A Yes, they have.

9 Q And could you please state the document  
10 that you're going to be offering for testimony  
11 today?

12 A Final staff assessment part 3 of 3, the  
13 alternatives section.

14 Q And you prepared that section?

15 A Yes, I did.

16 Q And does that state your professional  
17 opinion?

18 A It does.

19 Q Do you have any changes or corrections?

20 A No.

21 MS. WILLIS: We'd like to offer this  
22 witness for cross-exam, if there is --

23 PRESIDING MEMBER MOORE: Any objections?

24 MS. LUCKHARDT: No objections, no  
25 questions.

1 PRESIDING MEMBER MOORE: Ms. Poole?

2 MS. POOLE: No objections, no questions.

3 PRESIDING MEMBER MOORE: We'll enter  
4 that formally. Thank you.

5 MS. WILLIS: Thank you.

6 PRESIDING MEMBER MOORE: All right.

7 Sorry we made you wait. Ms. Luckhardt, now back  
8 to you.

9 MS. LUCKHARDT: Okay, the applicant  
10 calls Mr. Joe Rowley to testify in the area of  
11 alternatives. He has previously stated his name,  
12 occupation and qualifications for the record.

13 DIRECT EXAMINATION

14 BY MS. LUCKHARDT:

15 Q Mr. Rowley, could you please identify  
16 the portion of exhibit 1 you are sponsoring as  
17 your alternatives testimony?

18 A I'm sponsoring AFC section 3.11.

19 Q And I'm just going to ask a couple  
20 questions to get this in. Do you have any  
21 corrections to make to section 3.11 at this time?

22 A No.

23 Q Do you agree with California Energy  
24 Commission Staff's conclusion on page 5 of the  
25 alternatives section that any potentially

1 significant impacts of the Elk Hills Power project  
2 have been mitigated to less than significant  
3 levels?

4 A Yes.

5 Q And do you agree with CEC Staff that the  
6 no-project alternative is not superior to the  
7 proposed project?

8 A Yes.

9 Q And is the proposed project superior to  
10 alternatives you analyzed in section 3.11 of the  
11 AFC?

12 A Yes, it is.

13 Q And do you adopt section 3.11,  
14 identified previously, as your true and sworn  
15 testimony in this proceeding?

16 A Yes.

17 Q And does that include your best  
18 professional judgment?

19 A Yes, it does.

20 MS. LUCKHARDT: We'd like to offer  
21 applicant's testimony on alternatives into the  
22 record at this time.

23 PRESIDING MEMBER MOORE: Accepted. And  
24 questions, counselor?

25 MS. WILLIS: I just had one question on

1 the exhibit numbers of the applicant's testimony  
2 for today. I believe they've been moved into  
3 evidence, but I don't have a record of what  
4 exhibit number they are.

5 HEARING OFFICER WILLIAMS: 19D. Oh, you  
6 mean the --

7 MS. WILLIS: No, the applicant's, Elk  
8 Hills'. Not the AFC portions, but the portions  
9 that provide --

10 MS. LUCKHARDT: Twenty-something. We  
11 were going down on letters, it was, I think, --

12 MS. POOLE: While you're figuring that  
13 out can I move CURE's exhibits 44 and 45 into the  
14 record?

15 PRESIDING MEMBER MOORE: Any objection?

16 MS. WILLIS: No objection.

17 MS. LUCKHARDT: No objection.

18 PRESIDING MEMBER MOORE: So moved.

19 HEARING OFFICER WILLIAMS: The erratas  
20 are 21.

21 MS. WILLIS: I just remember them being  
22 marked --

23 MS. LUCKHARDT: Yeah, we were moving in  
24 applicant's testimony, the actual testimony that  
25 we've been filing beforehand, and I think it went

1 down letters after one main number. And I just  
2 can't get my hands on the exhibit list fast enough  
3 to tell you what it is.

4 It's all been under 20, I guess, so.

5 MS. WILLIS: Thank you.

6 HEARING OFFICER WILLIAMS: Right, yeah,  
7 it's -- yeah, 20. And we've just been moving it  
8 in under 20.

9 MS. LUCKHARDT: That's fine.

10 MS. WILLIS: That's fine, thank you.

11 PRESIDING MEMBER MOORE: Questions for  
12 Mr. Rowley?

13 MS. WILLIS: No questions.

14 MS. POOLE: No questions.

15 PRESIDING MEMBER MOORE: Thank you. All  
16 right, and, Ms. Poole.

17 MS. POOLE: We have no testimony on  
18 alternatives.

19 PRESIDING MEMBER MOORE: All right.

20 None. If there are none --

21 MS. LUCKHARDT: We just have a few folks  
22 here who would like to comment, if that's where  
23 we're at.

24 PRESIDING MEMBER MOORE: Understand.

25 Let me close the record then on alternatives, and

1 we'll open the comment period at the end of this  
2 hearing, a long and tedious hearing. I thank all  
3 the counselors for their patience.

4 HEARING OFFICER WILLIAMS: As one other  
5 housekeeping matter, in the briefs, which will be  
6 in accordance with the scheduling order, ten days  
7 from posting the transcripts, and then reply  
8 briefs, whatever it says.

9 Please include a section in those briefs  
10 on the exhibit list. If you have questions or  
11 comments or whatever --

12 PRESIDING MEMBER MOORE: Or you think we  
13 missed one.

14 HEARING OFFICER WILLIAMS: -- or you  
15 think we missed one, or whatever, please include a  
16 discussion of that, so that I can get the parties  
17 a final exhibit list at some point, so we don't  
18 have any issues on that.

19 MS. WILLIS: May I also ask a  
20 housekeeping question? There was a matter left  
21 undone at our last hearing on dry cooling. Will  
22 we know soon how we will be proceeding?

23 HEARING OFFICER WILLIAMS: Yes.

24 MS. WILLIS: Thank you.

25 PRESIDING MEMBER MOORE: All right, with

1 that I'm going to open the floor up, and the  
2 people who would like to address us in the comment  
3 period, I'm going to ask, because of the  
4 microphone situation, if you'd come up and sit  
5 next to staff counsel and offer us your comments.

6 So, anyone who's interested? Come on  
7 up. Please identify yourself for the record, and  
8 if your last name is tough to spell, please spell  
9 it out for our stenographer.

10 MR. CLARK: My name's Ivan Clark; I'm a  
11 Principal and Senior Director of R.W. Beck,  
12 Incorporated.

13 A little background: I'm a registered  
14 professional engineer and have 29 years of  
15 experience in the planning, licensing, and design  
16 of electric generation and transmission  
17 facilities.

18 Specific to this project I recently have  
19 been Project Manager for the Towantic Energy  
20 project in Connecticut. In licensing that  
21 project, somewhat similar project to this  
22 proceedings, it includes two Frame 7FA gas  
23 turbines in a combined cycle mode.

24 As part of that project management, we,  
25 R.W. Beck, prepared a BACT analysis in response to

1 Connecticut DEP's request, evaluating and  
2 comparing SCONOx to SCR. That document was  
3 prepared in January and February and was submitted  
4 in February.

5 It was surprising to learn that just  
6 last week that we had been -- our report had been  
7 attached to this particular proceeding as an  
8 example of another BACT analysis for reference.  
9 That was the first I knew about this situation  
10 here.

11 But a few comments, though, about the  
12 cost. We did a fairly detailed cost analysis for  
13 the BACT analysis, comparing SCONOx to SCR. And  
14 we were able to do that by meeting with ABB  
15 representatives in January, and securing  
16 information from them concerning what the capital  
17 costs are, what the operating characteristics are  
18 for the SCONOx and so on.

19 So our report that has been referenced  
20 here reflects the costs that we calculated and  
21 prepared for the SCONOx as compared to SCR. And  
22 really, if you look at the capital costs of the  
23 various people that have prepared BACT evaluations  
24 here, they're fairly close all across the board.

25 The major differences really lie in

1       whether how to treat the catalyst replacement or  
2       catalyst replacement in the future. And what are  
3       the steam and natural gas usages. Those appear to  
4       be the major significant differences between the  
5       various cost estimates.

6               We did a fairly detailed analysis of  
7       those particular elements based on the information  
8       that ABB gave us concerning energy usage, natural  
9       gas consumption, steam requirements, and the  
10      impacts those particular elements would have on  
11      the project's capabilities, as compared to a  
12      project with SCR.

13             And I think that's one reason there's  
14      some differences between costs, it's just the  
15      approach that we used in the detail that we made,  
16      or we got into in doing those cost estimates.

17             I might comment also, just an  
18      observation. We do a lot of review of projects as  
19      a firm for Independent Engineering Services, and  
20      in that review we review new projects having  
21      different kinds of technologies. And in that  
22      sense we are looking at this project with respect  
23      to the SCONOX technology versus SCR.

24             If we were to review this project as an  
25      independent engineer, and it was to include

1       SCONOx, we would be very skeptical of the risk  
2       involved in proceeding with the project.

3               Anytime that you have a new technology  
4       that has not been demonstrated at the size that  
5       you're dealing with, it raises a very large red  
6       flag for the financing community and the project,  
7       as a whole.

8               And we, as independent engineers, have  
9       to be very careful in recommending whether it's a  
10      good idea to proceed on a project of that type.  
11      So, we would be very sensitive to that issue of is  
12      this technology really demonstrated for the  
13      application on this project.

14              I think Evis Couppis, who will comment  
15      after me, has a lot more experience in reviewing  
16      those technologies of that sort, and he'll have a  
17      few comments about how you might treat those as an  
18      independent engineer.

19              Finally, the scale-up issue is one that,  
20      I guess, that comment relates to the scale-up  
21      issue is, in our opinion since there isn't a  
22      demonstrated project in the market today that is  
23      operating to use as a guide for this project,  
24      that's a fundamental flaw for proceeding on SCONOx  
25      on a given project at this point.

1 PRESIDING MEMBER MOORE: Thank you.

2 DR. COUPPIS: Okay, what I'd like to  
3 do --

4 PRESIDING MEMBER MOORE: Would you  
5 introduce yourself, please?

6 DR. COUPPIS: Yes, my name is Evis  
7 Couppis. I'm a Principal and a Senior Consultant  
8 with R.W. Beck. I have 27 years experience in the  
9 environmental field, mainly in the licensing area.  
10 Also have done a fair amount of work with  
11 independent engineering. I have a chemical  
12 engineering degree, a Ph.D., and also a registered  
13 P.E.

14 I would like to make my comments  
15 relative to the independent engineering, and to  
16 define what it is just to let everyone know what  
17 that is involved.

18 Independent engineering services are  
19 provided for lenders in trying to identify risks,  
20 both on the technical side as well as the  
21 environmental side. And then work with lenders to  
22 address the risks.

23 My comments will be from the viewpoint  
24 of an independent engineer, and the viewpoint of  
25 the lenders in trying to evaluate a project, as we

1 have here.

2 When a lender is involved with a project  
3 that employs a new process like we have with  
4 SCONOx, they must do a number of items.

5 One, they must understand the technical  
6 risks. Number two, they examine the operating  
7 history of the new process in similar  
8 applications. And I underline that.

9 The lenders want conclusive evidence,  
10 based on prior operating history, that the  
11 technology works. They would insist that the  
12 allocation of risks among the various  
13 participants, i.e., the owners, and the turnkey  
14 contractor, are such that the revenue stream of  
15 the project is intact.

16 The lenders will ask items like who will  
17 take the risk if the SCONOx process doesn't work.  
18 What are the technical options to fix whatever is  
19 not working. And what are the associated costs,  
20 and who would bear those costs.

21 And when I imply costs, that doesn't  
22 mean the costs with the technology, itself. It  
23 means protecting the revenue stream for the  
24 project. If the project is shut down for a number  
25 of months or weeks, that loses the opportunity to

1 generate revenue. That is important in terms of  
2 trying to cover the debt.

3           Ultimately they will ask, will the  
4 turnkey contractor wrap around the guarantees  
5 provided by the various vendors.

6           They will ask how will the project be  
7 available, will the project be available during  
8 the first one or two years of operation to the  
9 same degree as it would be after all the bugs are  
10 worked out.

11           The bottomline is if something doesn't  
12 work, who will take the risk to secure that the  
13 revenue stream for the project is good enough to  
14 cover the debt.

15           A couple of examples here that I think  
16 have come up throughout the day. There was a lot  
17 of talk about the life of the catalyst. Whether  
18 it's a three-year life or a ten-year life.

19           From a lender's view, if the guarantee  
20 is three years, he will use the three-year  
21 replacement life, and the cost associated with  
22 that to evaluate the project.

23           Even with SCRs, and we have experience  
24 with them, we have seen them last six, seven,  
25 eight, even nine years, if the guarantee is for

1 three years, they would use the three-year life  
2 cycle to estimate the costs.

3 So, the bottomline of a lender, while we  
4 can have technical discussions about whether a  
5 process is available, if they don't see it, they  
6 need to go to a site of a similar application,  
7 similar size, see it, touch it to reassure that  
8 it's there. And that may be an un-engineering  
9 type description of what they go through, but  
10 that's life. That is what is involved in getting  
11 a lender to a point where he's got a level of  
12 comfort that the process works.

13 The other item that I wanted to note.  
14 To my knowledge the guarantees that have been  
15 reported by ABB, to my knowledge have not been  
16 incorporated into the guarantees of an HRSG. The  
17 SCONOx, like the SCR, will have to be incorporated  
18 into the HRSG. Ultimately the vendor, the  
19 manufacturer of that HRSG will need to accept the  
20 design and guarantees that is offered by ABB.

21 And ultimately the turnkey contractor  
22 must, in turn, embrace the guarantees. The lender  
23 will look to the turnkey contractor to offer the  
24 wrap-around guarantees for the project.

25 Now, that's not to say that these

1 instruments cannot be developed for a project.  
2 Comparable to the scale-up issue, it's not that a  
3 technology can never be developed. The issue is,  
4 is it done now. And a project that deals with a  
5 new technology like we have here will be more  
6 difficult to develop all the contracts.

7 And if the relationships between vendors  
8 and manufacturers and turnkey contractors are not  
9 there, it will take more time. And more time is  
10 usually translated into costs.

11 I think that's about it for what I have  
12 to say here.

13 PRESIDING MEMBER MOORE: Thank you very  
14 much, appreciate your comments and your  
15 experience.

16 Yes, sir.

17 MR. McFADDEN: My name is Marty  
18 McFadden, and I'm the Vice President of Three  
19 Mountain Power. I've been in power plant  
20 maintenance operations, development and management  
21 positions for 30 years.

22 And I'm kind of caught between a rock  
23 and a hard place. On one side I have a hardnosed  
24 competitor, on the other side I have a hardnosed  
25 intervenor. I think I got raked over the coals

1 today, and I'd like to make a few comments.

2 I think I offer a different perspective  
3 from anybody else that's testified today, in that  
4 I tried to buy a SCONOx system for my project to  
5 see, so I could do a true evaluation of what the  
6 costs were.

7 And that came about because when we did  
8 our initial BACT analysis we determined, and it  
9 was prior to the EPA Region 1 letter in December,  
10 it was prior to ABB announcing the commercial  
11 availability of SCONOx, as they said they did in  
12 December. By the time those announcements came  
13 out our submittals were already in the hands of  
14 the Shasta County Air Quality Management District,  
15 and were being evaluated.

16 But the intervenors brought these to the  
17 attention of the District, and the District  
18 returned -- turned this over to us and said, we  
19 would like to see a supplemental BACT analysis,  
20 please find out what the situation is.

21 And the way we approached that situation  
22 was for some of the things that Mr. Couppis has  
23 said, we need to finance the power plant, and we  
24 need to find out what the costs are, and we need  
25 to find out what all of the costs are.

1                   And so what we did was we asked our  
2                   engineer to obtain a proposal for a heat recovery  
3                   steam generator with an integral SCONOx system.  
4                   And we elected to ask the heat recovery steam  
5                   generator manufacturers for integral SCONOx  
6                   because we expected to be able to get a wrapped  
7                   guarantee that we could evaluate, because that  
8                   wrapped guarantee, as has been explained, is also  
9                   wrapped into the EPC contractor's overall  
10                  guarantee.

11                  We also wanted to find out a lot of  
12                  information about the system so that we could go  
13                  to the Air Quality Management District and be sure  
14                  to say, if we accept this technology, or if this  
15                  technology is forced upon us by law or regulation,  
16                  then we will be able to be in full-time compliance  
17                  with the conditions of any permit that would be  
18                  issued to us. And that's kind of an awesome task.

19                  We sent -- I'm not sure we sent to four,  
20                  but we contacted four manufacturers, and Dr. Fox  
21                  said we sent the proposal -- the RFP to the wrong  
22                  ABB organization and it got delayed and things  
23                  like that. I don't think that's quite true,  
24                  because we do use the modern conveniences like the  
25                  telephone. And we were in contact with

1 representatives from ABB. And we sent it to  
2 Foster Wheeler, as well, who forwarded it on to  
3 the right people at ABB. They know what they're  
4 doing, they know how to purchase these.

5 Two companies came back, and I believe  
6 that they came back verbally and not in writing,  
7 Nooter-Erikson and Del-Tech, and just declined the  
8 bid. They would not wrap a SCONOX system into  
9 their own heat recovery steam generator. They  
10 would not integrate it, they would not do the  
11 integration function that we had identified as a  
12 serious technical and operational concern. Not  
13 that it wasn't something that couldn't be  
14 overcome, but that we needed to see how it could  
15 be done.

16 And so there were basically two RFPs out  
17 for a long time. And we did ask for a quick  
18 turnaround. We used the phone to identify that we  
19 were in a hurry because our project was being  
20 delayed. We're behind Elk Hills in this project,  
21 there is a certain value to being first to the  
22 grid in the marketplace, we all believe. And the  
23 delays were costly to us.

24 And so we asked for a week, and they  
25 said they'd do the best they could. And we

1 followed up, and we followed up, and we followed  
2 up, and about the 21st of March we were told it  
3 would be the end of the month. At the end of the  
4 month we were told it would be about the 30-day  
5 period.

6 Now, you can get a commercial proposal  
7 from a large equipment manufacturer in 30 days.  
8 There's no problem there. But, it was delayed.  
9 But it was also, they kept promising us it was  
10 forthcoming, and that it was forthcoming. And we  
11 waited.

12 On the 17th of April, I think it was, it  
13 was kind of the day we lost our patience. We were  
14 told the technical proposal would be in the mail  
15 that day, and that the commercial proposal would  
16 be following within a week.

17 And on the 20th we had received nothing.  
18 We did receive spreadsheets that showed what ABB  
19 estimated their BACT analysis to be, but we didn't  
20 have any specific information at all to back that  
21 up.

22 So we did use what we thought was the  
23 best available information, and we did apply our  
24 best judgment to it, which I think is appropriate.  
25 Because we'll be the ones that will making the

1 investment.

2 And at that time, on the 20th, we  
3 withdrew our RFP so we could go about our  
4 business. And we reported to the Shasta County  
5 Air Quality Management District in our  
6 supplemental BACT analysis that we again concluded  
7 that SCONox for the Three Mountain Power Project,  
8 in any event, was not commercially and technically  
9 feasible. We could not buy one.

10 Dated May the 5th, but arriving in my  
11 office on May the 8th was a proposal from ABB  
12 offering a SCONox system without a heat recovery  
13 steam generator. And that proposal actually left  
14 me more concerned about the commercial and  
15 technical availability of the SCONox system for  
16 several reasons that are contained in there  
17 relating to the things that we've heard.

18 We asked for a bunch of things, as you  
19 might imagine, so that we could, in detail and  
20 properly, analyze the system, so that we could get  
21 the heat recovery steam generator to wrap the  
22 guarantee and get the EPC contractor to then wrap  
23 that guarantee.

24 For SCR we're able to obtain a wrap from  
25 reputable EPC contractors that have no exceptions,

1 no liquidated damages for performance guarantees  
2 for the emissions control device. They will meet  
3 the specifications and they will conform to the  
4 permit conditions. Or the EPC contractor will  
5 make it right up to the limitation of liability,  
6 which in the contracts that we've negotiated and  
7 the term sheets we've negotiated is in the  
8 hundreds of millions of dollars. Over \$100  
9 million.

10 This is a very solid assurance that the  
11 thing is going to work, and it's not going to cost  
12 us any more than the original purchase price.

13 However, we didn't get the same kind of  
14 assurances from the SCONOX proposal. The SCONOX  
15 proposal had some elements to it that were kind of  
16 scary, in that the warranties had likely events  
17 avoiding, if I could say that.

18 The conditions placed on the warranties  
19 that were unacceptable: One of them was that we  
20 would have to follow the unspecified operating  
21 requirements of ABB. And I suppose those could be  
22 discussed in a negotiation, but then they also  
23 reserved the right to change those operating  
24 requirements during the warranty period, which  
25 leaves a huge uncertainty as to what the final

1 costs and reliability and performance are going to  
2 be.

3 The warranty is voided if the SCONOX  
4 catalyst is exposed to water, such as may occur in  
5 a heat recovery steam generator tube rupture. A  
6 heat recovery steam generator tube rupture, in my  
7 experience and understanding of power plants, is  
8 an anticipated operational event. It's going to  
9 happen. It's likely to happen during start-up  
10 from everything I've heard, but I have not  
11 personally started up a heat recovery steam  
12 generator on a combined cycle gas turbine plant.

13 And they provided performance  
14 guarantees, but these performance guarantees did  
15 not provide us assurances that we felt we  
16 absolutely needed. In particular, we intend to  
17 operate in a merchant mode, and we intend to  
18 operate over a wide range of conditions, and we  
19 intend to operate over the most of the year.  
20 Unless you're familiar with our project, you know  
21 that during high hydro we're going to -- we  
22 anticipate being shut down.

23 But they only provide a performance  
24 guarantee at one point, which was the 18 degree  
25 ambient case, which is the cold weather case. And

1 they didn't provide any performance for duct-fired  
2 cases. And we need to know those. We heard duct  
3 firing dismissed, but we intend to duct-fire, and  
4 we intend to duct-fire up to 20 percent of the  
5 capacity of the plant. So it is significant to  
6 us.

7 No data was provided for part-load  
8 operation. And no guarantee was made for a lot of  
9 the emissions.

10 So we held off. And in order to do the  
11 evaluation of the cost effectiveness, which we  
12 anticipated was how far we were going to get, we  
13 asked for specific things that were not provided,  
14 without which you really can't do the one-for-one  
15 apples-to-apples comparison.

16 But we asked for general arrangement  
17 drawings for the utility skids; we asked for  
18 expected and guaranteed emissions for NOx, carbon  
19 monoxide, unburned hydrocarbons, VOC, SOx,  
20 hydrogen sulfide and PM10 for each of the  
21 operating cases that we anticipated.

22 We asked for weights and dimensions. We  
23 asked for the process flow diagram. We asked for  
24 guaranteed utility requirements so we would know  
25 the cost of operating. We asked for start-up and

1 shutdown performance. We asked for price lists  
2 for spare parts for the first year of operation.

3 We asked for price maintenance  
4 contracts, for the emission control system. And  
5 we asked for the price of the catalyst, and for  
6 the least price of the catalyst.

7 And we didn't get those. And subsequent  
8 to this, as I said, I have already had discussions  
9 and I have an indicative price from several,  
10 actually, EPC contractors, for a full plant with a  
11 turnkey guarantee, wrapping the heat recovery  
12 steam generator and the SCR system at the  
13 performance levels that are in our AFC and will be  
14 in our permit. And there is, as I said, no  
15 conditions on emissions performance, no limitation  
16 due to liquidated damages. There's only the  
17 single limitation of liability which is over \$100  
18 million.

19 And we couldn't -- I asked one of those  
20 EPC contractors if they would offer the same  
21 thing, given SCONox proposal that we had at hand,  
22 after having described it to him. His answer was  
23 no, he would not.

24 And the inability to not have that kind  
25 of a wrap was discussed by Mr. Couppis, and, yes,

1 things can go forward in some of these things.  
2 And when there's a new innovative technology,  
3 which should be applauded, there are issues and  
4 there are costs. Those costs aren't wrapped into  
5 the table of the BACT cost effectiveness analysis.  
6 These are potentially very huge costs.

7 We have one other major concern that  
8 goes to those costs, and that is it's a  
9 requirement of the proposal of the buyer, that  
10 would be me, to obtain a soft landing clause in  
11 the air quality permit, which I don't believe our  
12 Air Quality Management District intends to give.  
13 And the soft landing is kind of a misnomer because  
14 the soft landing is if the SCONOX system fails to  
15 meet its performance guarantees, then ABB is  
16 absolved by the payment of liquidated damages,  
17 which were 15 percent of the contract price.  
18 Which would leave me with 85 percent of the  
19 contract price, and an obligation to find another  
20 technology that works, and put it into place.

21 That's the risk that the owner and the  
22 EPC contractors are not willing to take, that they  
23 have been describing to you.

24 So, in summary, without believable  
25 assurances from ABB, backed by credible guarantees

1       that the SCONOx system will allow our plant to be  
2       in continuous compliance with its permit, we can't  
3       see that it's technically and commercially  
4       feasible.

5                   And I'll answer any questions.

6                   PRESIDING MEMBER MOORE: I don't believe  
7       I have any. I thank you. You've made a good,  
8       clear presentation.

9                   MR. McFADDEN: Thank you.

10                  PRESIDING MEMBER MOORE: Thank you very  
11       much. Anyone else who would like to offer  
12       comments to us?

13                  All right, with that let me tell you I  
14       am going to close those evidentiary hearing.  
15       Bring it back, and I'm going to ask Major for any  
16       comments on housekeeping.

17                  HEARING OFFICER WILLIAMS: I think we've  
18       covered all the housekeeping matters. I think  
19       everyone is waiting for the order on water. And  
20       that will be forthcoming. So, I would really  
21       appreciate your comments on the exhibit list,  
22       though, keep that in mind, so that we don't run  
23       into a problem there.

24                  But I think that just about does it.

25                  PRESIDING MEMBER MOORE: Good.

1           MR. MILLER: I have just thought of a  
2 possible idea that might help that. Would it be  
3 helpful to you if all parties submit any errata  
4 suggestions to the exhibit list within a period of  
5 time, so that then, in briefing, everyone can --

6           PRESIDING MEMBER MOORE: If you know  
7 that you -- you've already spotted the errata --

8           HEARING OFFICER WILLIAMS: Yeah.

9           PRESIDING MEMBER MOORE: -- let's say  
10 today is --

11          MR. MILLER: Maybe a week.

12          PRESIDING MEMBER MOORE: -- Tuesday,  
13 close of business Friday, if you've got your notes  
14 together, and just send them to us.

15          MR. MILLER: I'm going to be traveling.  
16 I wonder if maybe Tuesday of next week.

17          PRESIDING MEMBER MOORE: I'll go for  
18 Tuesday of next week.

19          MR. MILLER: We won't have briefing  
20 start till ten days after the transcript, so --

21          PRESIDING MEMBER MOORE: Right, until  
22 after we get the transcripts anyway, so --

23          MR. MILLER: That way we'll all have the  
24 same numbers.

25          PRESIDING MEMBER MOORE: Good. We'll do

1 it.

2 MR. MILLER: Okay.

3 MS. POOLE: And then -- well, assuming  
4 there's -- will we get a revised exhibit list from  
5 you before we --

6 HEARING OFFICER WILLIAMS: Yes, oh,  
7 yeah, we'll --

8 MS. POOLE: -- write our briefs?

9 HEARING OFFICER WILLIAMS: -- we'll --

10 PRESIDING MEMBER MOORE: You will have  
11 that before -- probably at the same time you have  
12 the transcript.

13 MS. POOLE: Right.

14 PRESIDING MEMBER MOORE: All right, with  
15 that, unless there's any other item, we are  
16 adjourned. And thank you very much.

17 (Whereupon, at 7:40 p.m., the hearing  
18 was adjourned.)

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CERTIFICATE OF REPORTER

I, DEBI BAKER, an Electronic Reporter,  
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I further certify that I am not of  
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