

300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345

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UNITED STATES OF AMERICA

BEFORE THE  
NUCLEAR REGULATORY COMMISSION

In the Matter of:	X	
	X	
HOUSTON LIGHTING & POWER	X	
COMPANY	X	Docket No. 50-466
	X	
Allens Creek Nuclear Generating	X	
Station, Unit 1	X	

Krost Hall Auditorium  
Bates College of Law  
University of Houston  
Houston, Texas

Wednesday  
February 25, 1981

PURSUANT TO ADJOURNMENT, the above-entitled matter  
came on for further hearing at 9:00 a.m.

APPEARANCES:

Board Members:

SHELDON J. WOLFE, ESQ., Chairman  
Administrative Law Judge  
Atomic Safety and Licensing Board Panel  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

GUSTAVE A. LINENBERGER  
Administrative Law Judge  
Atomic Safety and Licensing Board Panel  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

DR. E. LEONARD CHEATUM  
Administrative Law Judge  
Route 3, Box 350A  
Watkinsville, Georgia 30677

1 APPEARANCES: (continued)

2 For the NRC Staff:

3 RICHARD L. BLACK, ESQ.  
4 U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

5 For the Applicant - Houston Lighting & Power Company:

6 J. GREGORY COPELAND, ESQ.  
7 Baker & Botts  
8 One Shell Plaza  
Houston, Texas 77002

9 JACK NEWMAN, ESQ.  
-and-

10 DAVID B. RASKIN, ESQ.  
11 Lowenstein, Reis, Newman & Axelrad  
12 1025 Connecticut Avenue, N. W.  
Washington, D. C. 20037

13 For the Intervenors:

14 STEPHEN A. DOGGETT, ESQ.  
15 Pollan, Nicholson & Doggett  
16 P. O. Box 582  
Rosenberg, Texas 77471

17 Representing:

18 LEOTIS JOHNSTON  
19 1407 Scenic Ridge  
Houston, Texas 77043

20 ROBIN GRIFFITH  
21 1034 Sally Ann  
Rosenberg, Texas 77471

22 ELINORE P. CUMMINGS  
23 926 Horace Mann  
Rosenberg, Texas 77471

24 CAROLINA CONN  
25 1414 Scenic Ridge  
Houston, Texas 77043

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APPEARANCES:

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For the Intervenors: (continued)

JOHN F. DOHERTY  
4327 Alconbury Street  
Houston, Texas 77021

BRYAN L. BAKER  
1923 Hawthorne  
Houston, Texas 77098

DR. DAVID MARRACK  
420 Mulberry Lane  
Bellaire, Texas 77401

WILLIAM J. SCHUESSLER  
5810 Darnell  
Houston, Texas 77074

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25WITNESSESDIRECTCROSSREDIRECTRECROSSBOARD  
EXAM.J. W. Dick  
(Resumed)

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By Mr. Schuessler

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P R O C E E D I N G S

9:00 a.m.

JUDGE WOLFE: The hearing is resumed.

It is now 9:02 a.m.

Present are Mr. Newman for Applicant, Mr. Black for Staff, Mr. Doherty and Mr. Doggett.

I understand the proceedings this morning continuing through today, and perhaps tomorrow, I don't know.

The Staff will present its witnesses beginning with Dr. Kerley, is that right, Mr. Black?

MR. BLACK: That's right.

JUDGE WOLFE: All right. You may proceed.

MR. BLACK: Dr. Kerley is on the witness stand now, and I ask that he be sworn.

Whereupon,

DR. C. E. KERLEY

a witness herein, having been duly sworn and cautioned to testify the truth, the whole truth and nothing but the truth, was examined and did testify upon his oath as follows:

## DIRECT EXAMINATION

BY MR. BLACK:

Q Dr. Kerley, do you have before you the testimony that has been pre-filed in this proceeding

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1 and incorporated in this proceeding in a transcript,  
2 previous transcript, entitled NRC Staff Supplemental  
3 Testimony of J. W. Dick, N. E. Hinkle, K. Johnson and  
4 C. R. Kerley, Relative to Alternative Energy Sources?

5 A. Yes.

6 Q. And, in that testimony could you indicate  
7 which sub-topics that you are responsible for?

8 A. I am responsible for Sub-topic 5, beginning  
9 on page 50, The Interconnection/Purchase of Power.

10 Q. Do you have any additions or corrections to  
11 that testimony?

12 A. Yes. I'll make one correction.

13 On page 51, the last line on that page, the  
14 ninth word in that line should be changed to "down".  
15 Change "out" to "down".

16 MR. BLACK: Here again, I think, I indicated  
17 to the Board that Dr. Kerley was responsible or  
18 sponsoring Passive Solar. And, I have gotten my signals  
19 crossed again.

20 You were not responsible or sponsoring the  
21 testimony on Passive Solar?

22 THE WITNESS: No. I am not.

23 MR. BLACK: That will be who?

24 THE WITNESS: Kim Elaine Johnson.

25 MR. BLACK: So, Kim Johnson, who will be the

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1 next witness is responsible for Passive Solar, as well as  
2 Solid Waste Combustion.

3 JUDGE WOLFE: All right.

4 MR. BLACK: That's two and three.

5 BY MR. BLACK:

6 Q Also, attached to this testimony, Dr.  
7 Kerley, is a statement of your professional qualifications.  
8 Are there any additions or corrections to that  
9 statement?

10 A No.

11 Q As corrected, and as submitted, is the  
12 testimony that you are sponsoring in this proceeding  
13 true and correct to the best of your knowledge and belief,  
14 and do you adopt it as your testimony in this proceeding?

15 A Yes, I do.

16 MR. BLACK: Mr. Chairman, we have no further  
17 questions.

18 JUDGE WOLFE: All right.

19 Any Voir Dire as to this witness.

20 MR. DOHERTY: I have a question first for  
21 counsel.

22 I don't see that he has anything left to  
23 testify on. According to my list he crossed out  
24 everything he was going to testify on.

25 MR. BLACK: No.



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1 He is testifying on Interconnection/Purchase  
2 of Power, pages 50 through 53.

3 MR. DOHERTY: So, we have three pages on  
4 Interconnection now to discuss.

5 MR. BLACK: Correct.

6 VOIR DIRE

7 BY MR. DOHERTY:

8 Q It is doctor, is that right?

9 A That's correct.

10 Q Yes.

11 What is regional sciences?

12 A Regional sciences is a combination of  
13 disciplines, involving economics, econometrics, geography,  
14 a wide range disciplines sometimes get involved in  
15 regional sciences.

16 It is a multi-dimensional, multi-discipline  
17 science.

18 Q Is your doctorate in economics?

19 A Yes.

20 Q I see.

21 Was this the first year that a Doctorate of  
22 Economics was granted by the University of Tennessee, 1972?

23 A No. Not to my knowledge.

24 Q Do you know when the first one was granted?

25 A I suspect many years ago. I don't know.

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1 Q All right.  
2 Have you ever designed an interconnect system  
3 for anyone?

4 A Designed an interconnect system?

5 Q Yes.

6 A Absolutely not.

7 Q Have you ever been consulted about the  
8 feasibility of one?

9 A No.

10 Q Have you ever been consulted about a pooling  
11 arrangement?

12 A No.

13 (Pause)

14 MR. DOHERTY: All right.

15 I don't have any further questions at this  
16 time.

17 MR. DOGGETT: I have no Voir Dire.

18 JUDGE WOLFE: Any objections or any Motions  
19 to Strike, I should say directed to the testimony of  
20 Dr. Kerley, which has previously been incorporated into  
21 the record as if read?

22 MR. NEWMAN: No objection.

23 JUDGE WOLFE: All right.

24 The testimony of Dr. Kerley, then, previously  
25 has been incorporated into the record as if read, and

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1 absent of any Motion to Strike or objections, we will  
2 proceed now with the cross-examination of Dr. Kerley.

3 Has there been any agreement between the  
4 present attending Intervenors as to the crossing out of  
5 alphabetical sequence?

6 MR. DOGGETT: There has been no agreement,  
7 but I have no cross-examination for this witness.

8 JUDGE WOLFE: All right.

9 Mr. Newman, do you have cross?

10 MR. NEWMAN: No, I do not, sir.

11 JUDGE WOLFE: Mr. Doherty?

12 MR. DOHERTY: Yes, sir.

13 JUDGE WOLFE: All right.

14 MR. DOHERTY: I have a few questions.

15 JUDGE WOLFE: All right.

16 CROSS-EXAMINATION

17 BY MR. DOHERTY:

18 Q Now, the first question on page 19 of your  
19 testimony, sir.

20 What proposed settlement did you have in  
21 mind there?

22 A This settlement would allow the utility --  
23 or the proposed settlement would allow the utility to  
24 interconnect with Southwest Power Pool without being  
25 subject to interstate regulation by the FERC.

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1 That requires them to make an application and  
2 get an approval to make such an interconnection.

3 Q Would that include -- what type of current  
4 would that -- would they be interconnecting?

5 A It could involve AC or DC.

6 I suspect that the line would be an AC  
7 connection.

8 But, I'm not sure.

9 Q Does the proposed settlement, say, specify  
10 AC?

11 A No. Not to my knowledge.

12 Q Does it specify DC, then?

13 A No. I don't think the connection is  
14 specified.

15 To my knowledge it isn't.

16 Q If the utility came under FERC's jurisdiction,  
17 what does that mean?

18 A That would subject them to all the interstate  
19 rules and regulations that now pertain to utilities which  
20 operate in interstate markets, I suppose.

21 Since I am not a lawyer, I can't say  
22 specifically what all the legal limitations would be,  
23 or legal implications.

24 I simply address the issue as an  
25 economic issue, and answered the questions as to whether

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1 or not it was feasible given this regulation, whether or  
2 not the utility could interconnect legally without being  
3 required to come into FERC jurisdiction.

4 Q All right, sir.

5 So, what rules would effect the economics.  
6 of the utility?

7 MR. NEWMAN: I'm sorry.

8 That question is too vague.

9 I don't understand what rules are being  
10 referred to in the question, and I don't think the witness  
11 can respond properly.

12 MR. DOHERTY: In a previous question he replied  
13 that the rules of FERC would apply if the utility came  
14 under FERC jurisdiction.

15 I am interested in knowing what rules would  
16 effect the economics of the utility since economics are  
17 his area.

18 MR. NEWMAN: If that's the rules you are  
19 talking about, that question is objectionable because it  
20 calls for a legal conclusion on the part of a witness  
21 who has already stated that he has no legal training.

22 MR. DOGGETT: All right, I will rephrase it.

23 BY MR. DOGGETT:

24 Q Do you know if any of the rules would effect  
25 the economics of the utility?

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MR. BLACK: Same objection.

BY MR. DOGGETT:

Q Do you know any of the rules?

A You said do I know any of the FERC rules?

Q The rules of FERC that are under discussion.  
Do you know any of those?

A I don't know rules. No.

I don't know any of the rules that FERC  
imposes on the utilities.

From an economic standpoint, the important  
issue is whether or not the utilities situation as far  
as producing power would be effected.

Whether its reliability would be effected or  
not.

Q By that do you mean whether its reliability  
would be decreased in some way?

A Potentially.

Q All right.

In answering the second question on page 50,  
what sources did you consult?

A We consulted primarily with individuals at  
NRC and with other Staff members.

Q Who, specifically, do you recall?

A I don't recall, actually.

Q Do you recall when you did some consulting

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1 on this?

2 A. This was about two months ago.

3 Q. That was two months ago.

4 (Pause)

5 All right. Going down to the bottom of page  
6 51, shifting subject now to the Powerplant and Industrial  
7 Fuel Use Act of 1978, you state, "The act prohibits  
8 construction of new base load oil and gas facilities, and  
9 the DOE intends to allow as few exemptions as possible".

10 A. Yes.

11 Q. Has it allowed any so far?

12 A. Has it allowed exemptions?

13 Q. Yes.

14 A. There has been some relaxation of the rules.

15 But, I don't think there have been any  
16 exemptions.

17 I'm not sure.

18 Q. All right.

19 Now, the way you have stated it, you used the  
20 word "intends" --

21 A. Yes.

22 Q. -- now, is that a stated policy of the  
23 agency responsible for administering the Powerplant and  
24 Industrial Fuel Use Act?

25 A. It is the stated policy of DOE in the

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National Energy Plan II, which was published in 1980.

Q All right.

Now, are they required by law -- have you read the law?

A Which law?

Q The Powerplant and Industrial Fuel Use Act.

A No. I haven't

Q Do you know if the law says DOE is to allow as few exemptions as possible?

MR. NEWMAN: Objection

MR. BLACK: I object to that. It is a legal conclusion.

MR. DOHERTY: I've only asked him if he has read the law, and if he has read those words or not.

MR. BLACK: He has said he hasn't read the law.

MR. DOHERTY: He might know some of the law without having read all of it.

MR. BLACK: But, he stated that DOE intends to allow as few exemptions as possible comes from the National Energy Plant II, it was published in 1980.

MR. DOHERTY: The law may also say the same thing.

(Bench Conference)

JUDGE WOLFE: I will overrule the objection.



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1 You can answer.

2 THE WITNESS: I don't know what the law says,  
3 but it's a policy statement that few exemptions will be  
4 allowed.

5 Obviously, if exemptions are possible, the  
6 law must allow some leeway there for exemption.

7 BY MR. DOHERY:

8 Q As an expert, would you expect that DOE  
9 would put a community in the dark in order to shut off one  
10 of these gas or oil plants?

11 A No.

12 Q Okay.

13 Moving on to page 52, marked Table 5, although  
14 it is your first table, it says, "Present and Planned  
15 Base Generating Capacity in the ERCOT and SWPP Areas  
16 Through 1990".

17 I can't determine which of these are planned  
18 and which are present in this table.

19 A They are combined.

20 Q So that, under ERCOT oil we have present  
21 and planned until 1990. Does that just, then, mean that  
22 under ERCOT this much capacity available that is oil-fired  
23 at this point?

24 A Yes --

25 Q They do not plan to add any more?

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1 A Most of the oil and natural gas is in place,  
2 and there are no plans to construct new plants in these  
3 categories.

4 Q Do you know of any plans to construct any  
5 coal or gas -- pardon me, any oil or gas plants in the  
6 SWPP region?

7 MR. NEWMAN: Excuse me, I want to ask a  
8 question to clarify the record.

9 Are you inquiring about peak load or base  
10 load plants, because this table appears to refer only to  
11 base load generation.

12 MR. DOHERTY: All right.

13 Thank you, counsel.

14 BY MR. DOHERTY:

15 Q Do you know of any planned construction of  
16 oil or gas-fired power stations in the SWPP area which will  
17 be base generating capacity?

18 A No.

19 Q Do you know of any which will be for peak  
20 generating capacity?

21 A No.

22 Q Do you know of any incomplete oil or gas  
23 units of this kind in construction?

24 A No.

25 Q All right.

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1 Now, turning to ERCOT for a minute, you state  
2 that the planned -- present and planned base generating  
3 capacity for coal is 14,000 plus megawatts.

4 A. Yes.

5 Q. Do you know how much of that is present?

6 A. Since I didn't include the figures in this  
7 table, I can't say how much is presently in place and  
8 how much is planned.

9 (Pause)

10 Q. What is the purpose of Table 5?

11 A. The purpose of Table 5 is to give an  
12 overview and summary of the capacity existing in each of  
13 those areas.

14 It's primarily intended to illustrate the  
15 large proportions of capacity in oil and gas which will  
16 not be available for generation in the future.

17 It is intended simply to give the reader an  
18 eye-view of the capacity and the mix of the capacity in  
19 each area, and some feel for what amount of capacity will  
20 have to be phased out under the current energy plan.

21 MR. DOHERTY: Excuse me, a minute, Your  
22 Honor. I would like to look at --

23 JUDGE WOLFE: Yes.

24 (Pause for Mr. Doherty to look through  
25 document.)

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1 BY MR. DOHERTY:

2 Q All right.

3 Just under the Table, you state, "Under the  
4 National Energy Plan II the coal strategy. . .".

5 What is that, the coal strategy?

6 A Coal strategy refers to a policy of developing  
7 and utilizing coal resources in the nation.

8 The strategy is primarily to utilize as much  
9 coal as possible under the National Energy Plan II  
10 which would include both the burning of coal and the  
11 development of essential facilities to produce synthetic  
12 fuels.

13 Q Then, you say, ". . .the strategy may effect  
14 the potential of importing electricity by HL&P".

15 What did you mean by that?

16 A It simply means that the potential of  
17 importation depends on the availability of capacity in  
18 other areas.

19 Q Um-hmm.

20 A If the coal strategy is implemented, it  
21 suggests that the other areas will also be phasing out  
22 oil and gas units and bringing on line coal units or some  
23 synthetic production processes.

24 Consequently, there isn't the base-load  
25 capacity available either in oil or gas for supplying

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1 import needs of other areas.

2 It is a situation where each utility region  
3 will probably be constructing new base-load coal facilities  
4 in the future.

5 And, therefore, for one utility to import  
6 from another may suggest that the other utility would have  
7 to build a plant to provide that power, which may effect  
8 the pricing and my effect the cost of electricity to  
9 the importing utility.

10 Q In your study of interconnection, does it  
11 typically require that the utility importing, is the word,  
12 -- all right, importing electricity has to pay more for  
13 that than developing itself -- to produce it itself?

14 A Generally, it is more expensive to purchase  
15 power than it is to produce it in your own facility.

16 (Pause)

17 Q Now, you also speak of large industrial  
18 boilers. Does the Powerplant and Industrial Fuel Use Act,  
19 would that Act cover boilers?

20 A Yes, it does.

21 Q Private owned boilers of big firms and that  
22 sort of thing?

23 A Yes.

24 Q Have you made any attempt to discover the  
25 impact, the prohibition industry would have on these two

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1 regional power systems?

2 A. There are major research programs under way  
3 at Oak Ridge and other institutions, evaluating that issue.

4 I don't know of any current literature that  
5 has concluded what the total impact will be.

6 It will be substantial in some industrial  
7 areas, like the industrial north, which depends a lot on  
8 oil and natural gas.

9 In fact, one of the studies that was  
10 conducted for DOE suggests that this study is the -- was  
11 done for DOE, it is called the Regional Issue Identification  
12 Program.

13 That study suggests that the conversion in  
14 the manufacturing sectors may actually effect industrial  
15 location to some extent since it will require some firms  
16 to depreciate out their buildings and equipment more  
17 rapidly; and, once you do that then you are in a position  
18 to relocate if you want to reinvest in buildings and  
19 equipement.

20 So, there are studies underway which suggests  
21 that in some areas of the country it would be quite  
22 heavily impacted by the Act.

23 Q Can you say anything about this area of the  
24 country?

25 A. This area would probably benefit more than

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1 be hurt by it.

2 The reason for that is that the southwest  
3 and the southeast in general are growing areas. So,  
4 consequently, any new capacity that comes on line  
5 probably is meeting new demands. And, therefore, is  
6 not represented as a depreciated out too rapidly.  
7 That is the life expectancy of plants is longer.

8 Q All right.

9 What is the longest interconnect that you  
10 know of in the United States right now?

11 A I don't know what the longest interconnect is,  
12 or even what the shortest interconnect is, as a matter of  
13 fact.

14 Q Perhaps I didn't make my question clear, I  
15 didn't want that as a factual question, so much as what  
16 you knew of yourself. What you knew of?

17 A Generally, utilities operate under a  
18 wheeling arrangement, I think.

19 So, if power is needed in New York, it  
20 could possibly be transferred from another area on a  
21 short term basis by simply transferring and trading of  
22 power between sectors.

23 That is the purpose of the electric  
24 reliability grid, and, so consequently, you could move  
25 power from one part of the country to another through a

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1 system of trading.

2 But, that doesn't mean there is one long  
3 interconnection between the west coast and the east coast.

4 Q Well, you introduced the word "wheeling".  
5 Would you tell me what that is?

6 A Wheeling is generally referred to, well, it  
7 refers to if utility "A" needs electric power from utility  
8 "C", it may do it by going through utility "B". So, that  
9 utility "B" provides the power to utility "A" while  
10 "C" makes up the deficit to "B".

11 Q Did you consider wheeling in the  
12 interconnection scenario you worked out here?

13 A No. Wheeling is not generally reviewed  
14 as a viable long term arrangement.

15 Q All right.

16 Did you consider the use of an interconnection  
17 to the, I think they call it, Western States Reliability  
18 Council?

19 A No.

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BY MR. DOHERTY:

1 Q Did you exclude consideration for any reason?

2 A No. I simply considered the SWPP because  
3 that was the nature of the question that we were asked  
4 to address.

5 Q Just a minute.

6 (Pause.)

7 Now further on page 52 you talk about a  
8 temporary gas surplus --  
9

10 A What page again?

11 Q Sorry. Fifty-two.

12 A Okay.

13 Q Temporary gas surplus.

14 Is the temporary gas surplus still going on?

15 A No, not to my knowledge.

16 Q When did it start and stop?

17 A Well, once demand catches up with the short-  
18 term supply, it begins to slow down obviously.

19 Q What year --

20 A I mean once the supply catches up with the  
21 demand.

22 Q What year did it start and what year did it  
23 stop?

24 A I don't think you can attach a point in time  
25 to when something starts or when -- when something starts

2-2

1 that's in a market context. It fluctuates.

2 Q When was it going on?

3 A It began with the implementation of the act  
4 in 1978.

5 Primarily what is intended to be shown here  
6 is that when you have dual markets, the interstate market,  
7 for example, has a higher demand for interstate gas than  
8 what's available.

9 The companies operating within the boundaries  
10 of the state obviously don't want to sell their natural  
11 gas at a low price.

12 It's to their advantage to hold the reserve  
13 or supply only local suppliers, if the local market is  
14 higher.

15 Once that restriction is removed, obviously  
16 a lot more natural gas is going to come into the inter-  
17 state market.

18 Q All right.

19 Now in 1978 as a result of the Natural Gas  
20 Policy Act -- or at the time of the Natural Gas Policy  
21 Act, which price was higher? Intrastate or interstate?

22 A Intrastate.

23 Q Do you as an economist believe that was because  
24 it was uncontrolled?

25 A it was a decision of the companies not to

2-3

1 participate in interstate markets because the price was  
2 too low for the product in their opinion.

3 And as long as they didn't choose to sell gas  
4 through the interstate system, they, therefore, were not  
5 subject to regulation -- price regulation -- interstate  
6 price regulation, that is.

7 Q All right.

8 Now further down on the same page, you state:  
9 "Although the price and conservation affects (sic) on  
10 electricity demand can be expected to lower future  
11 generation capacity needs" -- and then there's some more  
12 to that -- I'm wondering ... "price and conservation," do  
13 you believe that as the price goes up, that the conserva-  
14 tion increases?

15 A Yes.

16 Q Do you see that as a cause and effect re-  
17 lationship?

18 A I see it as a response to pricing, yes.

19 There are, however, limitations on the degree  
20 to which one can conserve within the existing technology  
21 base.

22 Q When you say response, do you mean an effect  
23 from a cause?

24 A No. I'm saying that you as an individual can  
25 respond only a certain amount to the price increases from

2-4

1 a conservation standpoint, because you are fixed in the  
2 short run to a certain technology situation.

3 You can add insulation to your house. You can  
4 take fewer trips in your car. Your car stills burns as  
5 much gas per mile as it did before.

6 There are a certain minimum number of trips  
7 that you'd still have to make, so there's a minimum amount  
8 of conservation one might make -- or could make within the  
9 existing technology base.

10 Q Are you then saying that it could not be a  
11 cause and effect relationship throughout?

12 A No. I'm saying there's a cause and effect.  
13 I'm saying that it doesn't mean that if you drive prices  
14 infinitely higher that you would drive demand to zero.

15 Q All right. We're just about finished.

16 The last sentence of your testimony on page  
17 53 -- I guess this is a conclusion. "Consequently there  
18 is no guarantee that HL&P will be able to purchase  
19 electricity in the future nor any certainty about what the  
20 cost of the electricity would be relative to that which  
21 could be produced with the ACNGS."

22 Is it conceivable that it would be cheaper  
23 to interconnect with the SWPP instead of build and operate  
24 ACNGS? That's Allens Creek. I'm sorry.

25 A Is it conceivable?

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Q Yes.

A Sure.

Q Is it likely?

A In my opinion it's unlikely.

MR. DOHERTY: All right. I have completed my questioning. Thank you very much.

JUDGE WOLFE: Is there redirect, Mr. Black?

MR. BLACK: No questions.

JUDGE WOLFE: Dr. Cheatum.

BOARD EXAMINATION

BY JUDGE CHEATUM:

Q Dr. Kerley, in response to Mr. Doherty's question relating to your definition of wheeling of power, and then your further discussion of the wheeling of power in the Southwest, or perhaps specifically in Texas, you responded that wheeling of power is not generally viewed as a viable long-term arrangement. Is that what you said?

A Yes.

Q Why is that? It's considered viable and a rather prudent arrangement in the Northeast, I believe.

A It's primarily for leveling out the seasonal and the intermediate peaks. Yes, that it true. Maybe I wasn't clear on that.

I'm thinking in terms of long-term needs for

1 electricity ... baseload needs for electricity.

2 It is generally not a viable way of supplying  
3 that electricity. However, for meeting seasonal peaks,  
4 emergencies ... it is a viable alternative and is used  
5 often, all the time.

6 Q So, therefore, you would modify that statement  
7 to that extent?

8 A Yes, modified to that extent, yes.

9 JUDGE CHEATUM: Thank you.

10 JUDGE WOLFE: Judge Linenberger.

11 BY JUDGE LINENBERGER:

12 Q As a starter, sir, some of the publications of  
13 yours that are listed at the end of your testimony make  
14 reference to something called, quote, Med-Med Scenario.  
15 Could you tell me what is the meaning of that?

16 MR. DOHERTY: Excuse me. I'm sorry to butt  
17 in. In fact, I really feel like a trespasser.

18 But where did you find that, Dr. Linenberger?  
19 I'd like to follow you.

20 JUDGE LINENBERGER: Page six of the qualifi-  
21 cations section at the end of the complete bundle of  
22 testimony.

23 MR. DOHERTY: Thank you, sir.

24 THE WITNESS: The Med-Med is a scenario which  
25 describes the expected future pricing of oil. There is a

2-7

1 high path, a low path and a middle path.

2 This simply refers to the middle path. It's  
3 used for evaluating the average or most likely condition.

4 JUDGE LINENBERGER: Thank you.

5 BY JUDGE LINENBERGER:

6 Q Under -- Included on page 50, the answer to  
7 the second question there, you indicate the staff's un-  
8 awareness of any law or regulation prohibiting the  
9 interconnection with other power pools.

10 I believe you indicated in a question -- in  
11 response to a question from Mr. Doherty that that informa-  
12 tion was derived by you from consultation with other  
13 members of the staff.

14 A Yes.

15 Q Did this include consultation with persons  
16 knowledgeable in the field of regulatory legal matters?  
17 By "regulatory" I have reference here to a utility.

18 A Yes.

19 Q So you did inquire into legal considerations  
20 that might make it attractive or unattractive to inter-  
21 connect?

22 A Yes.

23 I inquired as to whether or not people with  
24 knowledge knew of any regulations that would affect inter-  
25 connection. I found none.

1 I found that there were no known regulations  
2 that would affect it.

3 Q Did you have any concern that there might be  
4 a -- reside a body of such knowledge outside of the staff  
5 that could alter this conclusion, such that staying in-  
6 house with your questioning might perhaps mislead you?

7 A It's possible since my knowledge of the law is  
8 very little, that ... that's possible. However, I suspect  
9 that that's not a problem.

10 I don't think that there are regulations that  
11 would really affect the interconnection issue.

12 Q On page 51 in the middle of the first full para-  
13 graph, you talk about the importance of considering what  
14 you term a transmission overlay.

15 Would you comment on the meaning of that term,  
16 what it's about, how it's used, please, sir?

17 A In the context I use it here, I'm simply  
18 suggesting that as an economic consideration, the utility  
19 cannot simply view a connection as a point-to-point  
20 connection.

21 They have to consider the entire grid system  
22 under which they're operating.

23 And the maintenance of reliability within a  
24 grid system ... That suggests that the problem of inter-  
25 connection is not a simple problem, and that the entire



2-9

1 electric utility grid must be taken into consideration  
2 when you design your connections.

3 Q All right, sir.

4 What is it about your background or experience  
5 that enables you to state this kind of -- Well, it  
6 appears to me to be an opinion.

7 Or if it is not an opinion, if it is based on  
8 more than opinion, tell us, please, sir, what qualifies --

9 A It is not entirely opinion. It's approached  
10 from the economic standpoint ... although I am talking  
11 about technical connections.

12 So this was developed from reading material  
13 that describes the utilities' grid systems, and a technical  
14 description of the grid system.

15 I approached it simply from the economic stand-  
16 point suggesting that this is an economic issue that would  
17 have to be considered by the utility.

18 Q What does E-R-C-O-T stand for?

19 A Economic Reliability -- Electric Reliability  
20 Council of Texas.

21 Q Thank you.

22 With respect to the table you've presented on  
23 page 52, the heading indicates that the numbers in the  
24 table apply to a time span through the year 1990.

25 Should one view those numbers as existing

2-10

1 capacity in the year 1990, or might some of those numbers  
2 reach a maximum prior to 1990 and be smaller in the year  
3 1990?

4 A It's possible they will be smaller if those  
5 planned units are not brought on line... are not constructed.

6 Q Well, I guess I have to inquire as to your  
7 source of information for these numbers.

8 A The source for this is on a tape that we main-  
9 tain at Oak Ridge. And it's called the "Generating  
10 Unit Reference File." It's often called the GURF tape.

11 This tape has listed on it each utility's  
12 plans for new capacity in the future and existing capacity.

13 It is based on information reported by the  
14 utilities themselves.

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1 BY JUDGE LINENBERGER:

2 Q Would that GURF tape have allowed you, if you  
3 had so desired, to tabulate these numbers on a year-by-  
4 year basis from now through 1990?

5 A Yes.

6 Q Well, I'm still having a problem. If these  
7 numbers are available on a year-to-year basis, from now  
8 through 1990 -- perhaps beyond, but you picked 1990 --  
9 what year did you pick for extracting the numbers, or what  
10 caused you to decide that any given number here represents  
11 the time span between 1981 and 1990?

12 A I went to 1990 primarily because it falls in  
13 the time interval of this proposed plant.

14 Q Right.

15 A Outside 1990 is not really relevant.

16 Q Sure.

17 But that doesn't quite answer my question. I  
18 gather these are not the numbers that would apply in 1990,  
19 or at least you've stated some uncertainty as to whether  
20 they would be applicable for the year 1990. Is that  
21 correct?

22 A Well, if you understand the process of report-  
23 ing, utilities simply have a certain amount of capacity  
24 on line. And then they have a projected need for new  
25 capacity, and they have certain plans to bring new units

2-12

1 on. And they have an expected date at which time these  
2 units will become operable.

3 This information simply accumulates for these  
4 two areas: the total amount of existing capacity, including  
5 planned retirements and planned new additions that would  
6 be available by the year 1990.

7 Does that clarify it?

8 Q I'm not sure. What I think I heard you just  
9 say is that the numbers in this table most nearly represent  
10 real life in the year 1990.

11 A Yes.

12 Q Okay.

13 So they're not really representative of 1985?

14 A They include capacity that is presently --

15 Q Understood.

16 But you give a mix here of fossil versus  
17 nuclear. And what I'm trying to ascertain is: Is the  
18 mix that's represented in Table 5 more representative  
19 of the system in 1990, or is it more representative of the  
20 system in 1985 or --

21 A Oh, I see.

22 It certainly represents the mix in 1990.

23 Q Okay.

24 A -- given all retirements and planned ad-  
25 ditions.

2-13

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1 Q Fine. That's what I was trying to establish.  
2 Going to your final sentence on page 55 --

3 A Fifty-three?

4 Q Fifty-three, I beg your pardon.

5 Do you consider that's a statement of your own  
6 opinion; or is it based on more than opinion?

7 A It's my opinion.

8 Q Mr. Doherty asked an analogous question with  
9 respect to the word "guarantee," but let me ask it a  
10 slightly different way.

11 One doesn't need the existence of a guarantee  
12 to cause one to assess what might develop into an attractive  
13 option.

14 So the lack of a guarantee to me does not  
15 rule out the attractiveness of an interconnect option.  
16 Your conclusional statement -- concluding and conclusional  
17 statement would seem to me to be interpretable on the  
18 basis that seeing no guarantee of ability to purchase  
19 electricity in and of itself determined that the option is  
20 not attractive.

21 Now is that truly what you mean to say there?

22 A Perhaps the word "guarantee" is a bit strong.  
23 But what's intended there is that even given the current  
24 situation for importation of electricity is more likely,  
25 it may be in the future less likely; and the utility may

2-14

1 not have that option to import, if other utility areas are  
2 experiencing the same sorts of demand pressures, the same  
3 sorts of requirements to retire gas and oil units.

4 So I'm saying that the probability of importing  
5 may deteriorate over time rather than improve. And to that  
6 extent the utility has a great deal of uncertainty about  
7 whether it can import in the future, should the need  
8 arise.

9 I think "guarantee" here is not intended to  
10 suggest that one would be required to have a guarantee  
11 before considering that option.

12 Q Have you been called upon to make evaluations  
13 similar to this one in connection with licensing proceed-  
14 ings involving other nuclear -- planned nuclear capacity?

15 A No, I haven't.

16 I have been a consultant to many environmental  
17 impact statements on an indirect basis, but not directly.  
18 This is the first time I've become directly involved in  
19 testimony.

20 Q Did you personally contribute or write any  
21 portion of the Allens Creek Final Environmental Statement?

22 A No, I didn't.

23 Q Have you been --

24 A However, I might add that I have -- in this  
25 capacity I have been an advisor to most impact statements

2-15

1 that have been produced at Oak Ridge.

2 Q Have you been requested to critique any portion  
3 of the Allens Creek Final Environmental Statement?

4 A Not specifically.

5 JUDGE LINENBERGER: All right, sir, that's  
6 all. Thank you.

7 BY JUDGE WOLFE:

8 Q You state that you have never directly prior  
9 to this -- working on this testimony, you have never  
10 directly participated in a study of interconnection/purchase  
11 of power. Is that correct?

12 A That's correct, yes.

13 Q Prior to this time what indirect input or  
14 participation have you had on this subject matter?

15 A None directly.

16 I approached it strictly from an economic  
17 standpoint, as an economic issue, which the experience  
18 would not be totally useful from one place to another, if  
19 the economic circumstances change.

20 JUDGE WOLFE: All right.

21 We will now have cross-examination based  
22 solely on Board questioning.

23 Mr. Newman.

24 MR. NEWMAN: Just one question.

25 ///

2-16

## RE-CROSS-EXAMINATION

1  
2 BY MR. NEWMAN:

3 Q In response to Judge Linenberger's question  
4 about the basis for your last sentence, you responded  
5 that was based upon your opinion. But I don't believe  
6 you were asked about the basis for your opinion.

7 Is that opinion based on studies, literature  
8 searches any work experience, or perhaps your work at Oak  
9 Ridge associated with the construction and operation of  
10 modeling economic activity associated with energy  
11 facilities?

12 Which portion -- What elements go into  
13 making up your opinion?

14 A Primarily my opinion is based on my knowledge  
15 of the general economic trends across regions, my ob-  
16 servations as to the particular utility plant mixes in  
17 various areas, government policy, and generally my  
18 experience in working in these areas leads me to that  
19 conclusion.

20 MR. NEWMAN: That's all I have, sir.

21 JUDGE WOLFE: Mr. Doggett.

22 MR. DOGGETT: I have no cross.

23 JUDGE WOLFE: Mr. Doherty.

24 MR. DOHERTY: Yes. I have a couple of  
25 questions.



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BY MR. DOHEPTY:

Q What studies specifically have you used in developing the opinion which you have stated on page 53?

A You mean the final statement on 53?

Q Yes.

A I haven't used any studies. I'm an economist, and I approached it simply from an economic standpoint, as an economic description of the problem.

Q All right.

I believe a minute ago Judge Wolfe asked you about some of your indirect participation in environmental impact statement preparations with regard to interconnection and -- I think it was need for power -- purchase of power.

Unless I'm mistaken, I think you said, "Well, directly," and never really got around to what the indirect participation was.

I may be wrong, but I thought --

A Could you clarify that question? I'm not sure I know what you're talking about.

Q All right.

A moment ago he asked you what your indirect participation had been in environmental impact statements.

A Okay.

Q I just think you didn't quite make --

2-18

1 MR. BLACK: Is there a question?

2 MR. DOHERTY: I asked him a question a moment  
3 ago -- He said "okay," as if he understood there was a  
4 question.

5 MR. BLACK: But you made a statement. He  
6 said okay to the statement.

7 But I'm asking: Is there an outstanding  
8 question now?

9 MR. DOHERTY: Are you ready to reply, sir?  
10 Do you think there's a question, or do you want me for the  
11 third time to go through it?

12 THE WITNESS: Are you saying -- No, I don't  
13 understand the question. Will you repeat it?

14 MR. DOHERTY: All right.

15 BY MR. DOHERTY:

16 Q What was your indirect participation in any  
17 environmental impact statements with regard to inter-  
18 connection and purchase of power?

19 A I haven't reviewed interconnection and purchase  
20 of power issues. I have reviewed economic impact analyses  
21 conducted in various environmental impact statements.

22 Q All right.

23 Would it be fair to say -- going back to page  
24 50 on the second question there that Judge Linenberger  
25 spoke about. You state: "The staff is unaware of any law

2-19

1 or regulation prohibiting the interconnection."

2 But would it be fair to say that the Staff  
3 is aware of laws which discourage interconnection?

4 A I'm not aware of any that discourage inter-  
5 connection, except from the standpoint that a utility may  
6 choose not to become under interstate regulation for  
7 various reasons, which probably are only known to the  
8 utilities.

9 But that's the extent of my knowledge of  
10 that.

11 Q Do you feel that what you've just said is  
12 contradictory to the last sentence in question one on  
13 page 50 of your testimony?

14 A No.

15 Is it contradictory?

16 Q The last sentence states: "The proposed  
17 settlement removes legal limitations that would discourage  
18 the interconnection between HL&P and the SWPP."

19 A Yes, that removes that particular aspect of  
20 the problem.

21 Q So there is the aspect of discouragement?

22 A What was intended to be suggested there is  
23 if a utility chooses not to participate in interstate  
24 power arrangements which would subject them to FERC  
25 regulations, this settlement -- proposed settlement would

1 remove that disincentive.

2 Q All right.

3 Now I'm sorry to have to run back to page 53  
4 again, but this is my last question, I hope.

5 Did you consult any person about that state-  
6 ment -- ask anyone to look it over?

7 A My conclusion?

8 Q Yes.

9 A No, I haven't.

10 It's such a general statement that it is  
11 not -- I fail to see the problem with it, I suppose.

12 Q All right, thank you.

13 MR. DOHERTY: No further questions.

14 JUDGE WOLFE: Is the witness to be excused  
15 permanently?

16 MR. BLACK: I have a few questions.

17 JUDGE WOLFE: All right. On redirect, all  
18 right.

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## REDIRECT EXAMINATION

1  
2 BY MR. BLACK:

3 Q Dr. Kerley, getting back to this last statement  
4 or sentence on page 53, should a utility have a guarantee  
5 of power in an interconnected system, in order to include  
6 such power as baseload capacity to meet electrical demand?

7 A Yes. It should probably be arranged in a  
8 firm contract.

9 Q Does it need a guarantee of power in an inter-  
10 connected system in order to obtain necessary power during  
11 periods of peak demand?

12 A (No immediate response.)

13 In other words, does the guarantee really have  
14 to apply to obtain peaking power?

15 A If it's a long-term arrangement, yes, I  
16 suppose. But I can't say for sure.

17 Q So, in other words, what I'm trying to get at  
18 is your word "guarantee" meant to imply that one -- that a  
19 utility would need such a guarantee if that utility were  
20 relying on long-term arrangements of purchasing power  
21 to meet baseload capacity -- or to meet electrical demand  
22 in a baseload mode?

23 A From the utility standpoint, they would have to  
24 say -- or to feel that there was a high probability of  
25 importing power, and that the arrangement could be made

3-2

1 with another utility.

2 So in that sense it would be a form of guaran-  
3 tee, from the standpoint of expecting power to be  
4 available.

5 Q Now in response to a question from Judge  
6 Linenberger, I believe it's your testimony that there is  
7 no legal impediment that you're aware of that would pro-  
8 hibit HL&P from interconnecting with other utilities.

9 Is this based upon your limited legal knowledge  
10 of FERC regulations?

11 A Yes.

12 Q And is that meant to imply in any way that you  
13 have looked at anti-trust implications in the legal sense?

14 A No.

15 MR. BLACK: I have no further questions.

16 JUDGE WOLFE: All right. Is the witness now  
17 to be excused permanently?

18 MR. BLACK: Yes, Your Honor.

19 JUDGE WOLFE: All right. The witness is  
20 excused permanently.

21 (The witness was excused.)

22 MR. BLACK: The Staff at this time would like  
23 to call Ms. Kim-Elaine Johnson to the stand.

24 (Pause.)

25 JUDGE WOLFE: Would you remain standing, please.

3-3

1 Raise your right hand.

2 Whereupon,

3 KIM-ELAINE JOHNSTON

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

6 JUDGE WOLFE: Please be seated.

7 DIRECT EXAMINATION

8 BY MR. BLACK:

9 Q Do you have before you a document entitled  
10 "NRC Staff Supplemental Testimony of J. W. Dick, N. E.  
11 Hinkle, K. Johnson, and C. R. Kerley Relative to Alterna-  
12 tive Energy Sources"?

13 A Yes, I do.

14 Q Could you indicate to the Board and the  
15 parties which topics in that testimony you are sponsoring?

16 A I have prepared written testimony on the topics  
17 of solid waste energy plants and on passive solar.

18 Q Is that testimony reflected on pages 20  
19 through page 35 in this testimony?

20 A Yes, it is.

21 Q Do you have any additions or corrections to  
22 this testimony?

23 A No, I have not.

24 Q Do you also have before you a statement of  
25 professional qualifications?

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1 A Yes, I have.

2 Q Do you have any additions or corrections to  
3 that statement?

4 A No.

5 MR. BLACK: I have no further questions.

6 JUDGE WOLFE: Is there voir dire?

7 MR. DOGGETT: I have none.

8 MR. DOHERTY: I have some, Your Honor.

9 JUDGE WOLFE: Yes.

10 VOIR DIRE

11 BY MR. DOHERTY:

12 Q Turning to your personal qualifications,  
13 please. You received a B.S. degree in Resource Economics  
14 from the University of Massachusetts.

15 A Yes.

16 Q Does that make you an economics major?

17 A That makes me a major in resource economics,  
18 which is a sub-section of economics.

19 Q Yes.

20 Does the Economics Department -- Did they  
21 establish a program at that school?

22 A No. The Department of Resource Economics is  
23 in the College of Agriculture.

24 Resource Economics is a sub-section of the  
25 field known as Agricultural Economics, which means that



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1 it's mainly applied microeconomic theory and econometrics,  
2 quantitative methods, but does not involve the theories  
3 of economic history or economic thought.

4 Q I see.

5 All right. And then you stated that you re-  
6 ceived an M. S. degree in 1980. Now between 1978 and  
7 1980 were you full-time as a student pursuing that degree  
8 program?

9 A I was a half-time student.

10 Q Were some of your co-students able to achieve  
11 the degree in a year then?

12 A No.

13 All students in our department are required to  
14 be half-time research assistants or teaching assistants  
15 while they're pursuing their studies.

16 Q Well, on the supposition that two halves equal  
17 a whole then, is it that you have one year of academic  
18 work, plus one year of some type of lab experience? Is  
19 that correct?

20 A The Master's Degree at the University of  
21 Massachusetts in Resource Economics is made up of a  
22 minimum of 30 credits of academic studies and a minimum  
23 six-credit thesis.

24 I actually pursued about 42 hours of academic  
25 studies.

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1 Q I see.

2 Now in your undergraduate work, did you take  
3 any courses in the field of chemistry?

4 A I took a chemistry course.

5 Q All right.

6 Did you take any physics courses?

7 A No, I did not.

8 Q All right.

9 Did you take any biology?

10 A No.

11 Q All right.

12 I notice you have stated the name of your  
13 thesis -- or the title of your thesis.

14 Now you mention an econometric approach. When  
15 you were doing your -- Well, let me back up a minute.

16 When did you receive your degree? What month  
17 in 1980?

18 A I defended my thesis in June.

19 Q In June? And that's when you received it, or  
20 essentially it was complete; is that right?

21 A That is when my degree was complete. It was  
22 received at the degree date of September.

23 Q I see.

24 Now fixing that period of time in mind, did  
25 you at any time study any of the works of Kent Anderson?

3-7

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1 A Yes, I did.

2 Q All right.

3 And did you study Dr. Perl's -- Did you  
4 study him also?

5 A No, I did not.

6 Q All right --

7 A Pardon?

8 Q There was no question left in my mind.

9 Did you study Dr. Anderson's work on conser-  
10 vation in California?

11 A I have read that article.

12 Q Did you read a RAND Report of his?

13 A Yes. That is the article to which I'm refer-  
14 ring.

15 Q Okay.

16 Now in your work for a Master's degree,  
17 approximately how many hours were you supervised in this  
18 research?

19 A I'm not sure I understand the question. Are  
20 you talking academic hours or are you talkin about  
21 an actual physical period of time?

22 Q Well, I'm wondering how many hours your ad-  
23 visor spent with you.

24 A That's a difficult question.

25 Q You could make an estimate.

3-8

1 MR. BLACK: What's the relevance --

2 MR. NEWMAN: Mr. Chairman, I'm going to object  
3 to that question. This is really getting off into  
4 trivia. It's not going anywhere, and I think if Mr.  
5 Doherty has a point to make about Ms. Johnson's academic  
6 training, he ought to just come right out and ask the  
7 question that's on his mind.

8 It's hardly relevant to know how many hours  
9 her supervisor was looking at her.

10 MR. DOHERTY: I've asked the question that's  
11 on my mind.

12 It appears to me that the witness has just  
13 barely completed her education and has had very little  
14 experience.

15 Therefore, I think a great deal of her  
16 qualifications as a witness has to be on the basis of her  
17 education.

18 Therefore, I believe a fairly deep inquiry --  
19 which is just about over, incidentally -- should be made  
20 because there's just nothing else to really dig into after  
21 graduation.

22 She graduated in 1980. She has indicated she  
23 has been employed at Oak Ridge.

24 That's a period of ... I don't know yet, but  
25 it can't have been any longer than eight months. That's

3-9

1 not an awful lot to work on to establish this witness'  
2 qualifications.

3 JUDGE WOLFE: Objection overruled.

4 THE WITNESS: In formal conferences with my ad-  
5 visors, I probably spent approximately 10 or 15 hours in  
6 the average week.

7 Informal conferences were an ongoing process ..  
8 at coffeekbreaks or during classes or at any other times.  
9 There is actually probably more contacts with my advisors  
10 than is indicated by that ten-hour-a-week figure.

11 MR. DOHERTY: All right.

12 BY MR. DOHERTY:

13 Q Did you yourself do the calculations -- I'll  
14 have to look at the page. Perhaps you remember it.

15 There are some calculations --

16 Page 27.

17 Did you do those, ma'am?

18 And I'm sorry about the "ma'am".

19 A Pardon?

20 Q Did you do the calculations on page 27?

21 A I multiplied out those numbers, yes.

22 Q Did you determine the formula to use?

23 A The general formula was derived in part from  
24 intervenor testimony from earlier hearings.

25 Q From intervenor ...

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A. I'm not sure I have the date on these.

I believe this is 1978, September through November.

These are responses to contentions. I expect that these are the interrogatories.

Q So you received at some point some work done by one of the intervenors and used that formula to determine what you placed on page 27?

A. I used the general formula ... if I can find it. I don't believe that the intervenor response included a measure of the conversion efficiency.

And I don't believe that they included such problems as the moisture content of the waste.

- - -

3-11

1 BY MR. DOHERTY:

2 Q Well, we'll come to that.

3 Now moving away from that and back to your  
4 personal qualifications again, please.

5 You state that you joined Oak Ridge National  
6 Laboratory. You have been working on developing incentives  
7 for siting nuclear waste isolation facilities.

8 Now what -- Describe your work, please.  
9 What is that work?

10 A The work in that area is merely an attempt  
11 to figure out plans which would treat fairly those  
12 municipalities which will have permanent long-term  
13 storage facilities for high-level waste.

14 Mainly it's a discussion in terms of the  
15 payments in lieu of tax system, which it has been our  
16 opinion should be paid as regular property taxes.

17 Q Uh-huh.

18 So the incentive is tax benefits?

19 A That is probably among the incentives. The  
20 work on this project has not proceeded very far.

21 Q Uh-huh.

22 When did you start it?

23 A This project began in August.

24 Q I'm sorry. I see you -- Well, no.

25 Then you state: "Currently, I am researching

1 the economics of energy and materials recovery from  
2 municipal solid waste." I'm wondering when that -- When  
3 did you start that?

4 A Work on that project started in October.

5 Q I see.

6 Have you read the "Handbook of Solid Waste  
7 Disposal, Materials and Energy Recovery" by Van Nostrand?

8 A I have read at least portions of that.

9 Q All right.

10 MR. DOHERTY: Mr. Chairman, I move that this  
11 witness be excluded from presenting her testimony, because  
12 of lack of qualifications.

13 I have pointed out that her experience is  
14 quite limited, that in many instances her experience  
15 doesn't really apply to solid waste or solar energy  
16 issues.

17 There is no mention here of any experience  
18 with solar energy at all.

19 While I'll grant you there is some mention of  
20 solid waste isolation, that work apparently began in  
21 October; and that work apparently has been concurrent  
22 with some other work.

23 So that certainly could not have been full-  
24 time work for her employer.

25 While I'm somewhat loathe to say it, I find it



3-13

1 strains my credibility that use would be made of a formula  
2 supplied by an intervenor's -- I don't know. I never  
3 was an expert witness ... but simply someone that  
4 occasionally had done some help, some of whom I'm familiar  
5 with.

6 And as I say, I'm somewhat loathe to say it,  
7 but I don't think for a decision about a major power  
8 project in South Texas, that consideration of this person's  
9 testimony is justified on both of the issues.

10 Now, particularly the solar issue, which I  
11 find just nothing to base any expertise on at all.

12 I think she has been unfairly brought here.  
13 I actually think she's someone who's starting out ...  
14 with very limited opportunities, and that Staff has not  
15 presented a true expert witness; not that Staff cannot,  
16 but it has not done so yet.

17 And I don't feel the standards should be this  
18 low for presentation of expert testimony before this  
19 Board.

20 This subject has come up before, even prior  
21 to beginning these hearings.

22 And I'm of the opinion that -- Well, to  
23 summarize it. I'm of the opinion that she does not qualify  
24 under Rule 703 (I believe it is) or 702 of the Federal  
25 Rules of Evidence.

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Thank you.

MR. NEWMAN: Before I take a position, may I ask a few questions of the witness?

JUDGE WOLFE: Yes.

BY MR. NEWMAN:

Q Ms. Johnson, can you describe the course work in your M. S. degree in Resource Economics. What subjects, what kinds of subjects did you take?

A I had 12 course hours under my Master's degree in microeconomic theory, which is somewhat more than the Ph.D. students in my department take.

I also had six hours in econometrics, three course hours in linear programming operations research, three course hours in mathematical economics, six course hours in resource economics ... just on resource issues alone, and three course hours in macro.

Q Your course work in Resource Economics, can you describe in some greater detail the material that you studied in that course?

A In courses in Resource Economics, you cover material, such as is related to the exhaustible resource theory, such as optimal extraction, including some optimal control work.

We also worked on an extranality theory and general welfare economics.

3-15

1 Q And during what time did you prepare your  
2 thesis on the residential demand for electricity in New  
3 England?

4 A Including time spent in beginning to research  
5 the topic in order to narrow it down, the last year and a  
6 half to year and three-quarters of my study was done on  
7 this.

8 Doing the actual computer work, development of  
9 theory and writing of the report took a little better than  
10 a year.

11 Q Did you have to study in the course of prepar-  
12 ing that thesis materials relating to energy resources,  
13 in particular the use/demand of electricity?

14 A I'm not sure I understand the question.

15 Q Okay.

16 Did you in the course of preparing your study,  
17 did you examine the literature having to do with components  
18 of electrical demand, the components of electrical supply?

19 A Yes. I have especially studied the components  
20 of electrical demand. Many studies treat them as separate  
21 issues.

22 Q And how about electric supply?

23 A The electrical supply literature was not  
24 studied exhaustively. I have read a few articles and have  
25 some knowledge from utilities themselves, but the particular

3-16

1 components were not exhaustively studied.

2 Q And what literature did you study in prepara-  
3 tion for your appearance here with respect to the passive  
4 solar question?

5 A I have had a long-term interest in passive  
6 solar for the last four or five years.

7 Q Would you describe that interest and how  
8 you've pursued it?

9 A I have read virtually anything I could get my  
10 hands on on the passive solar subject, including books on  
11 design, and have designed a passive solar house which is  
12 in a blueprint stage currently.

13 Q Can you describe at all some of the kinds of  
14 literature and articles that you've studied. Were they  
15 professional journals or popular literature? What kinds  
16 of materials did you read?

17 A I have read articles from such journals as  
18 "Solar Energy." And there's a table which I think is  
19 called "Solar World" -- I'm not certain.

20 I've read what small amount has come through  
21 that out of public utilities.

22 I've read the articles referenced on page 35  
23 of my testimony.

24 Q And can you describe the work that you had to  
25 do in order to prepare the design of the passive solar

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????

1 system that you just mentioned?

2 A The system that I designed was very passive.  
3 It consisted of an earthburn structure with south facing  
4 glass. It should be a hillside structure with massive  
5 storage area, in terms of concrete floors and walls and  
6 greenhouse additions.

7 Q Did you consult with other people in preparing  
8 those plans ... people who are knowledgeable in the field  
9 of solar generation?

10 A I have shown those plans to architects and  
11 builders who have told me that they believe it to be a good  
12 design.

13 Q Let me see: Am I correct then that you have  
14 been looking at the question of passive solar, did you  
15 say, for five years?

16 A Approximately.

17 Q Okay.

18 And I wonder whether you can describe some of  
19 the research that's ongoing now that you're performing with  
20 respect to solid waste combustion and electricity genera-  
21 tion.

22 A The work that I was doing ended up not being  
23 funded by the Laboratory. We were planning on developing  
24 a discrete choice model to determine how ... a plan for a  
25 municipality ... to decide whether they wanted to attempt

3-18

1 to recover materials, particularly paper components and  
2 probably make the development of a waste energy system  
3 impossible, and in using a waste energy system.

4 Q Can you describe --

5 A The work that I did involved a lot of litera-  
6 ture search on discrete choice modeling, which I did not  
7 have the experience, and reading of the literature on the  
8 recycling options and the material that's referenced in my  
9 testimony for solid waste energy plants.

10 Q That's fine.

11 MR. NEWMAN: I have no other questions.

12 JUDGE WOLFE: I would note for the record --  
13 it's now 10:31. I notice that Mr. Baker made his appearance  
14 at 10:29.

15 MR. NEWMAN: Having asked those questions and  
16 having listened to Ms. Johnson describe the five years of  
17 study of passive solar and the extensive literature re-  
18 search and work that she has done in the economics of  
19 material recovery from municipal solid waste, I believe  
20 that Ms. Johnson clearly qualifies under the applicable  
21 provisions of the Federal Rules by virtue of both her  
22 studies and her practical experience.

23 MR. BLACK: I certainly concur in Applicant's  
24 observation about Ms. Johnson's qualifications.

25 I think that it is clear that under the

3-19

1 applicable Federal Rules, a person can qualify as an  
2 expert witness by reason of education.

3 And I believe that Ms. Johnson has amply  
4 demonstrated that she is a distinguished scholar, as her  
5 professional qualifications indicate, in the field of  
6 resource economics.

7 I do not wish to spend too much time on this,  
8 but I find it incredible that Mr. Doherty is affronted by  
9 the Staff's presentation of a witness of this quality.

10 The Government takes great pride in being --  
11 or giving such distinguished scholars an opportunity to  
12 improve their lot (so to speak) and also giving them ex-  
13 perience in testifying in proceedings such as this.

14 I think he should be more affronted if we took  
15 a person who had a degree in psychology and tried to pre-  
16 sent them as an expert witness in nuclear physics.

17 But certainly that is --

18 MR. DOHERTY: Well, Mr. -- Counsel, what are  
19 you referring to --

20 JUDGE WOLFE: Wait, wait. Mr. Black hadn't  
21 completed.

22 Yes, Mr. Black.

23 MR. BLACK: I have completed.

24 I think she is amply well-qualified to present  
25 this testimony.

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JUDGE WOLFE: Yes.

Mr. Doherty.

MR. DOHERTY: I believe that counsel for Applicant has stretched a five-year interest now into study.

BY MR. DOHERTY:

Q Did you state that you had studied solar energy for five years?

A I have -- What is your definition of "study"?

Q Did you have a course in solar energy?

A No, I have not --

Q -- beginning your freshman year of college?

A I have not had course work in solar energy.

Q You've had no course work at all in solar energy?

A No. Nor do I know of any courses that are offered in passive solar techniques.

Q Uh-huh.

Well --

MR. NEWMAN: Incidentally, the question I used was not "academic training." I asked whether or not she had studied the passive solar technique. And I did not limit that to academic study.

MR. DOHERTY: In your summary a moment ago



3-21

1 counsel, I believe you said she had studied for five  
2 years.

3 BY MR. DOHERTY:

4 Q Now were you studying -- Ms. Johnson, were  
5 you studying solar energy your freshman year on the  
6 side, for example?

7 A I am very much interested in passive solar  
8 construction for residential houses. And that interest  
9 has led me to read on my own, and for my own enrichment,  
10 journal articles, magazine articles, as well as the  
11 tremendous quantity of construction books that are now  
12 available.

13 Q All right.

14 Would you name some of those construction  
15 books that you have in mind, please.

16 A I don't know the authors. There are such things  
17 as "Energy-Efficient Homes You Can Build," "Passive Solar  
18 Houses."

19 There -- They tend to be the same sort --

20 Q Is that a book title: "Passive Solar Houses"?

21 A I believe so.

22 Q Uh-huh.

23 Anything further?

24 A There are more. The names are not at the top  
25 of my mind.

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Q Have you ever read "The Sun Betrayed" by  
Raymond Reese?

A. No, I have not.

MR. DOHERTY: All right. I have no further ...  
you know ... Let me just stop at this point.

(Bench conference.)

- - -

4-1

1 JUDGE WOLFE: The Board has conferred. And  
2 with regard to Mr. Doherty's Motion to Exclude, we deny  
3 that motion.

4 As in the past, we have said that we would  
5 admit such testimony, incorporate it into the record, hear  
6 the cross-examination and ultimately in our findings and  
7 initial decision weigh such testimony.

8 All right.

9 MR. DOHERTY: Mr. Chairman --

10 JUDGE WOLFE: Yes.

11 MR. DOHERTY: I move to strike certain aspects  
12 of this testimony at this time.

13 JUDGE WOLFE: All right. I wish you had brought  
14 that to our attention earlier, that you had two motions --  
15 both of them at the same time.

16 But, all right --

17 MR. DOHERTY: My apologies.

18 JUDGE WOLFE: That's all right. Go ahead.

19 MR. DOHERTY: At the foot of page 23 there's  
20 a single word I wanted to strike, the last word on page  
21 23 and the top line on page 24.

22 JUDGE WOLFE: Which words were these?

23 MR. DOHERTY: The words to be struck are:  
24 "but atmospheric regulations may still be breached  
25 occasionally."

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1 JUDGE WOLFE: Yes. Proceed.

2 MR. DOHERTY: The basis of this is that the  
3 statement is prejudicial. This type of statement has not  
4 been permitted with regard to comparing other types of  
5 energy in previous contentions.

6 We have not been permitted to say that  
7 occasionally something may go wrong, and that won't be  
8 very good, which is essentially the content of this state-  
9 ment.

10 It's quite vague actually. It's fairly  
11 obvious that something can go wrong sometimes. But I think  
12 that the rules we've been following have pretty much pro-  
13 hibited as vague ... and I think in this case it would be  
14 prejudicial as well, to permit a negative statement about  
15 this type of technology to go into the record, while not  
16 permitting the same type of rather unfounded statement to  
17 go in the record with regard to the alternative energy  
18 sources.

19 The witness does not express what this breach-  
20 ing is ... just -- I can't determine what it is that  
21 she is saying clearly enough to focus a question out of  
22 it.

23 Therefore, I'm not -- In a sense, I'm just  
24 not on notice as to what it means.

25 And, therefore, I move that that portion --

4-3

1 that that sentence be struck.

2 MR. NEWMAN: Do you want to address that,  
3 Mr. Black?

4 MR. BLACK: I would love to.

5 MR. NEWMAN: Go ahead.

6 MR. BLACK: Well, first of all, with regard  
7 to its being vague, that is something that can be cleared  
8 up through cross examination. I don't think that would be  
9 a proper basis for a motion to strike.

10 Insofar as its being prejudicial, I'm not so  
11 certain that that is a proper basis for a motion to  
12 strike as well.

13 I am, frankly, at a loss as to how it's  
14 prejudicial. It is merely stating something that is a  
15 factual matter, that can be elicited through examination of  
16 this witness, as to what her knowledge is as to what  
17 scrubbers are used for, what effectiveness they have,  
18 and what atmospheric regulations may be breached oc-  
19 casionally through the use of scrubbers.

20 Those types of things can be elicited through  
21 cross-examination on this statement.

22 So, all in all, I don't believe that a proper  
23 basis has been stated that would make this motion to  
24 strike proper.

25 MR. NEWMAN: The motion, Mr. Chairman, is

4-4

1 entirely without merit.

2 The fact that something is prejudicial or not  
3 clearly understandable to Mr. Doherty is not a ground for  
4 striking testimony.

5 As Mr. Black has indicated, it is subject to  
6 cross-examination; and, of course, ultimately the Board  
7 has the -- is charged with the responsibility for looking  
8 at that statement and determining whether in the light of  
9 cross-examination it is entitled to weight.

10 Clearly, nothing here goes to admissibility.  
11 And the motion should be denied promptly, I think.

12 (Bench conference.)

13 JUDGE WOLFE: The motion to strike is denied.

14 You may proceed to cross-examine to clarify,  
15 if there is any element of vagueness there, and question --  
16 cross-examine the witness on her knowledge of past  
17 breaches of regulations or why she believes that they would  
18 be breached occasionally.

19 MR. DOHERTY: Begging your pardon, but may I  
20 ask one question -- a procedural question?

21 Would it then be proper, following this cross-  
22 examination, to move to strike? Or is that out of order?

23 JUDGE WOLFE: We'll just wait and see. It's  
24 academic at this point.

25 MR. DOHERTY: All right. Thank you.

1 JUDGE WOLFE: Anything else before we proceed  
2 to cross-examination?

3 MR. BLACK: The Staff has no further oral  
4 direct.

5 JUDGE WOLFE: All right.

6 So as noted, the testimony of the witness having  
7 been previously incorporated into the record as if read  
8 will remain so.

9 The Motion to Exclude has been denied. And  
10 the Motion to Strike has been denied.

11 We will now proceed then to cross-examination.  
12 Has there been an agreement between Mr. Doherty, Mr.  
13 Baker, and Mr. Doggett as to any one of the parties  
14 proceeding out of alphabetical sequence?

15 MR. DOHERTY: Yes, sir, there has.

16 Mr. Baker will follow me, with the Court's  
17 permission.

18 JUDGE WOLFE: Baker will follow Mr. Doherty,  
19 and Mr. Doggett will go first.

20 MR. DOHERTY: Yes.

21 JUDGE WOLFE: I see. All right.

22 Mr. Newman, do you have cross-examination?

23 MR. NEWMAN: No, sir.

24 JUDGE WOLFE: Mr. Doggett.

25 MR. DOGGETT: Yes.

## CROSS-EXAMINATION

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BY MR. DOGGETT:

Q Ms. Johnson, is the topic of passive solar techniques included in the workshop you're preparing on electric utility decisionmaking in the area of alternative sources of power?

A The workshop we were preparing did not deal specifically with any techniques. It dealt exclusively with the utilities and state regulatory commission attitudes towards alternative energy sources, and not with the alternatives specifically.

Q All right.

In preparing for this workshop did you determine what the attitude of the Texas Public Utility Commission is in regard to the various alternative energy sources?

A No, we have not.

Q In what way do you determine what the attitudes of the utility commissions are towards the alternative energies?

A Are you speaking on a generic basis or for a specific commission?

Q Well, I want to know how you find out what their attitude is. Do you look at past decisions, or do you interview board members, or just how do you do it?



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1           A.    One could do either of those things. This  
2 workshop was not intended to address what their attitudes  
3 may be exactly, but to decide how they make the decisions  
4 on these kinds of technologies, whether they deal with  
5 future successes or --

6                   And the workshop was meant as well to bring  
7 in experts for enrichment of the Laboratory and for each  
8 other.

9                   We were merely organizers.

10           Q     Well, is this meant to be an academic-type  
11 workshop? Or is it more real-world practice oriented?

12           A     I suspect that it would be academic.

13           Q     Did you consult with anyone that you consider  
14 to be an expert in the passive solar field in preparing  
15 your section of testimony concerning passive solar?

16           A     I did not consult with individuals, no.

17           Q     Do you know any experts in this field?

18                   MR. NEWMAN: I'm sorry. That question is not  
19 clear to me, Mr. Chairman.

20                   Do you mean: Do you personally know experts  
21 in the field? Or is that being introduced in the sense  
22 of "Are you aware of experts in the field"?

23                   MR. DOGGETT: I'll ask it both ways.

24 BY MR. DOGGETT:

25           Q     The first question will be: Do you personally

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1 know any experts in this field?

2 A Yes.

3 Q Who is that?

4 A Kathy Temple of TVA is a designer for them in  
5 the field of passive solar.

6 Q All right.

7 Do you know the names of any other experts,  
8 other than the ones you personally know?

9 A There are many experts in the field.  
10 Frank Kreith would be one.  
11 I'm not able to make a listing.

12 Q Now how do you determine whether or not a  
13 person -- How do you determine in your own mind whether  
14 or not a person is an expert in this field?

15 A I would consider a person an expert who is  
16 widely referenced in the literature and has produced a  
17 portion of that literature.

18 Q Now you are not referenced anywhere in any  
19 literature on passive solar, are you?

20 A No, I am an economist.

21 Q In preparing your testimony, did you attempt  
22 to do any direct investigation of the use of solar --  
23 passive solar techniques in the Greater Houston area?

24 A No, I did not.

25 Q Were you able to locate any data in your

1 literature search of an area which would be comparable to  
2 the Greater Houston area as regards the use of passive  
3 solar?

4 A. There is data on the general availability of  
5 insulation, which covers areas at the same latitude as  
6 Houston.

7 I'm not sure exactly which areas are covered  
8 in this data ... by city.

9 The question of passive solar in these con-  
10 tentions is largely economic in nature.

11 Q When you say there's data on insulation for  
12 cities in the same latitude, what cities are those?

13 A I do not have that material.

14 Q Did you do any preparation in order to get  
15 ready for your testimony today?

16 A Pardon?

17 Q Did you do any preparation in getting ready  
18 to testify?

19 A What do you mean by preparation?

20 Q Did you review the literature or go over your  
21 direct testimony or anything of that nature?

22 A I have read over my direct testimony.

23 Q Did you bring any supporting documents to --  
24 other than the references which you have cited in your  
25 direct testimony?

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A. Not on that contention, no.

Q. Now in considering the economics of a particular alternative energy source -- and in this particular case passive solar -- the latitude of the city is certainly not the only factor that you would have to consider, is it?

A. No, it is not.

Q. What would some of the other factors be?

A. For applicability of the different solar techniques, you'd need to consider the general humidity of the area. For example, comparing Phoenix with Houston would probably be inappropriate since that's such a dry area. The techniques which are possible are not the same.

- - - -

4-11

1 BY MR. DOGGETT:

2 Q What other factors, besides latitude and  
3 humidity?

4 A Applicability of a particular passive solar  
5 technique is site specific. It is not just specific to  
6 the Houston area. I don't think that you would be able  
7 to separate it that way.

8 For example, in talking about passive venti-  
9 lation techniques, in the testimony of your ability to do  
10 such things as to have the air cooled as it goes under  
11 the ground is limited to how much yard you have. Around  
12 the city -- inside of the city of Houston, my observation  
13 on the highways is that people don't have yards.

14 Therefore, they would not be able to bury a  
15 plastic pipe in order to cool the air.

16 Your question cannot be answered on the basis  
17 of merely the city itself, especially when you're consider-  
18 ing passive technologies.

19 Q Well, we're talking, are we not, about  
20 this particular area when we're talking about this con-  
21 tention, are we not?

22 A Yes, we are.

23 Q Are you saying it's impossible to give any kind  
24 of projection as far as the application of passive solar  
25 techniques goes in this particular area?

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1 A What kind of projection are you asking for?

2 Q Just the economic feasibility of it.

3 A The economic feasibility is limited to the  
4 specific applications which are limited, as I just men-  
5 tioned, in terms of the specific site involved.

6 However, the demand projections which you  
7 have list a long-term elasticity of demand. That  
8 elasticity includes the types of adjustments that people  
9 make in terms of their changing capital stock as a result  
10 of price changes.

11 That's what differs ... what makes the long-  
12 term elasticity different from the short-term elasticity.  
13 This change in technologies.

14 Q I think in your two preceding answers you  
15 used the word "site specific." Are you -- correct me if  
16 I'm wrong -- are you saying that the only way that you  
17 can determine economic feasibility is to look at one  
18 particular site, meaning a yard or a building?

19 A I can tell you in general that passive solar  
20 heating by south facing glass is economically feasible.

21 I can tell you in general that using a  
22 traum wall is economically feasible.

23 However, if you are shaded by a tall building  
24 next to you, putting as much south facing glass as you  
25 want to, is not going to be economically feasible. The

4-13

1 capital costs will not recover any energy, if the sun  
2 can't get through.

3 Q Well, I understand that. But are you saying  
4 you did not make any overall analysis of the feasibility of  
5 this -- of passive solar techniques in the Allens Creek  
6 area?

7 A The feasibility of the techniques I discussed  
8 is not affected by the city location.

9 Q Well, now isn't that contradictory to what you  
10 said earlier about the latitude and humidity of a parti-  
11 cular area having an effect on --

12 A That affects the physical quantity of energy  
13 saved. But --

14 Q Doesn't that affect the economic feasibility  
15 of the technique?

16 A It can, if the technique is marginal. The  
17 passive techniques involve -- the ones that I discussed  
18 mainly involve very low capital costs.

19 The higher capital cost measures, such as  
20 using roof ponds, are going to be affected by the ef-  
21 fectiveness of the system.

22 Techniques which involve digging a hole in your  
23 yard by yourself and buying \$20 worth of piping are likely  
24 to be effective even in areas -- this is a cooling  
25 technique -- even in areas such as the Northeast where the

4-14

1 cooling load is not very high.

2 Just because there's a permanent increase of  
3 very low capital costs, no operating and maintenance  
4 costs -- or very little -- and some reduction in your  
5 coolant.

??

6 Q Well, I understand from what you're saying  
7 that in a particular situation, these passive solar  
8 techniques may or may not be economically feasible.

9 But are you prepared today to give us an  
10 opinion as to whether or not these techniques are feasible  
11 in the broad sense in the Allens Creek area; and if so,  
12 what -- how much energy will be saved, or what percentage  
13 reduction can we expect from the application of these  
14 techniques?

15 MR. NEWMAN: Mr. Chairman, I'm going to object  
16 to that question or that point that Mr. Doggett has just  
17 made.

18 There is nothing in this contention which  
19 requires an analysis of passive solar techniques in the  
20 Allens Creek region.

21 I guess it depends on how you treat "region."  
22 But the contention talks about the potential for saving  
23 electricity through the use of passive solar techniques  
24 in general.

25 It's TexPirg's 7(d) and Cummings Contention



4-15

1 6(c).

2 So any implication that this testimony is or  
3 should be designed to consider solar at the Allens Creek  
4 site is wholly without any basis.

5 MR. DOGGETT: Can I respond to that?

6 JUDGE WOLFE: Yes.

7 MR. DOGGETT: Mr. Newman and I certainly have a  
8 difference of opinion as to what the thrust of that con-  
9 tention is.

10 The contention says that there has not been a  
11 dispositive assessment of the energy demand reduction  
12 potential that might derive from conservation measures  
13 available to Applicant, because neither the Applicant nor  
14 Staff have considered the increased use of passive solar  
15 techniques.

16 Now the thrust of that contention is obviously  
17 site specific. It's not talking about anywhere else but  
18 this plant.

19 MR. NEWMAN: It is site specific, Mr. Doggett,  
20 only in the sense of the extent to which it could affect  
21 the Applicant's requirements, which go way beyond the Allens  
22 Creek area and involve a system that is substantially  
23 greater.

24 And it seems to me that the contention calls  
25 for an evaluation as to the effect on the Applicant's

4-16

1 overall system and requirements to supply that system as  
2 they may be diminished by the passive solar technique.

3 I see nothing here that would suggest one needs  
4 an Allens Creek specific siting in order to evaluate the  
5 effect of passive solar.

6 (Bench conference.)

7 JUDGE WOLFE: We will allow the question, Mr.  
8 Doggett, if it's not restricted to the Allens Creek site,  
9 but is extended and encompasses Applicant's service terri-  
10 tory.

11 MR. DOGGETT: That's fine. I'll make that  
12 the question then.

13 BY MR. DOGGETT:

14 Q Are you prepared today to give us an overall  
15 assessment of the feasibility of the use of the passive  
16 solar techniques in the Applicant's service area? And if  
17 so, are you also prepared to give us -- if it is feasible --  
18 what the end result of that would be, in terms of the  
19 need for the extra power?

20 A I'm not prepared to tell you the potential  
21 savings from a particular technique on a home, because  
22 that issue is not important to the testimony addressed.

23 Q Is it because it's not important or because  
24 you can't do it?

25 A I may -- I'm not sure whether I could come

4-17

1 up with energy savings from a particular technique.

2 It is not important because no matter how much  
3 energy can be saved to a particular unit by adoption of  
4 passive solar techniques, there is no method by which you  
5 can determine how many people will actually adopt those  
6 techniques.

7 And HL&P is unable to demand that people build  
8 their houses with passive solar methods.

9 Q Well, are you saying then that you can't do  
10 it? It's impossible to estimate?

11 MR. NEWMAN: I'm sorry. Impossible to esti-  
12 mate what, Mr. --

13 MR. DOGGETT: Well, first, she said it wasn't  
14 important.

15 Then she -- I think she said she couldn't  
16 do it. I think she gave me two different answers.

17 I'm asking for a clarification of her answer.

18 THE WITNESS: I'm not sure I understand your  
19 question.

20 BY MR. DOGGETT:

21 Q Well, if I understood what you said the first  
22 time you responded to me, you said it wasn't important to  
23 the analysis.

24 And then I asked you whether or not it wasn't  
25 important, or was it just that you couldn't perform the

1 analysis.

2 And I think you responded by saying you  
3 couldn't perform it because there are factors there that  
4 you just can't calculate.

5 A I responded that it was not important. I  
6 added to that response that I was not sure whether or not  
7 I was able to describe the energy savings from each  
8 technique.

9 MR. NEWMAN: Mr. Chairman, I'm going to inter-  
10 ject here because I have a feeling that the record is  
11 getting very confused.

12 The witness has testified about the potential  
13 effect --

14 MR. DOGGETT: I'm going to object. I think  
15 the record will speak for itself. I don't want any inter-  
16 jection unless it's an objection to my question.

17 MR. NEWMAN: Well, I'll object to your  
18 question on the grounds that I don't believe it's designed  
19 to create a meaningful record.

20 I think there is a necessity for some clarifi-  
21 cation of the record before the examination goes forward,  
22 because I don't think that you and the witness are  
23 talking about the same thing.

24 Therefore, your question is not going to lead  
25 to the development of a meaningful record or answer.

1 MR. DOGGETT: I think the question has been  
2 asked and answered.

3 She answered -- She attempted to give an  
4 answer to my question. I think the objection comes too  
5 late to prevent the answer from going into the record.

6 Now Mr. Newman will have a chance on redirect,  
7 if he wants to clarify the record, he can ask her some  
8 questions.

9 JUDGE WOLFE: All right.

10 I'll overrule the objection.

11 BY MR. DOGGETT:

12 Q Ms. Johnson, are you aware of any studies  
13 that have attempted to do the very thing that I'm talking  
14 about: an overall assessment of the economic feasibility  
15 of applying these techniques in a particular area?

16 A There are many studies which list the appli-  
17 cability of a particular technique, usually heating  
18 techniques.

19 In fact, to my knowledge, exclusively heating  
20 techniques -- by some different areas, not anywhere near  
21 as specific as the Houston/Galveston area, for example.

22 But more on a regional basis.

23 These are studies which give the maximum  
24 conceivable reductions in heating load on an average degree  
25 day basis from which one could probably estimate the

1 cost savings if you have exact knowledge of the fuel  
2 source being replaced and the price of that fuel source.

3 Q Did you attempt to do such an analysis on  
4 the HL&P service area for passive solar?

5 A No, I did not.

6 Q Now earlier in response to one of my  
7 questions, you said that -- I think you said -- my  
8 recollection of what you said is that it didn't appear  
9 that passive solar techniques would be feasible in the  
10 Houston area because in driving along the freeway you had  
11 observed that people in Houston didn't have yards --

12 A No, no, I did not say that.

13 Q Explain to --

14 A I said that the particular passive device  
15 that I was discussing, which involves drawing air through a  
16 pipe under a substantial portion of ground and into your  
17 house, which cools the air and, therefore, cools the air  
18 in your house -- is not going to be applicable to every  
19 person in Houston because some of the houses in Houston  
20 which I have seen did not have yards and would not be  
21 able to use that technique.

22 However, in general, that technique is  
23 economically feasible.

24 Q But you have no idea --

25 A But it's not feasible to every person because --

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Q I understand --

A -- every person has different kinds of technological constraints, not merely economic constraints.

Q So you weren't making a general statement about the Houston area?

A No, I was not.

Q I notice on the first page of your testimony concerning passive solar, which is page 30, you go into some definitions about what is passive solar and what are other types of conservation measures.

And you exclude from the category of passive solar insulation and energy conservation by architectural design.

Now is that a distinction that is generally recognized among experts in this field?

A This distinction was derived from the literature by J. D. Balcomb, I believe.

Q Do you know whether or not all the experts in this field follow this delineation?

A I believe this delineation was derived for Balcomb's benefit by him in order to clarify his discussion on the topic.

I do not know whether all persons would consider, for example, the avoidance of window placement -- not as a conservation technique, but not as a passive

4-22

1 technique.

2                   However --

3           Q       Linear placement, what are you talking about  
4 there?

5           A       On page 30 you'll see that -- "Similarly, the  
6 use of window shading or placement to avoid heat gain is  
7 [considered] an architectural conservation measure."

8                   There may be some experts who would think of  
9 that as a passive solar measure, although that seems un-  
10 likely to me considering that the sun is not directly  
11 involved.

12                   However, I do not think you will find any  
13 experts that consider insulation a passive solar tech-  
14 nique.

15           Q       Well, when you talk about linear placement,  
16 are you, in fact, talking about how you put the house  
17 down on the ground, as to how it faces south or something  
18 like that, whether or not your house faces south? Is  
19 that what you're talking about when you talk about linear  
20 placement?

21           A       Window placement.

22           Q       Okay.

23                   Anyway, you go on to say that the distinction  
24 between these different factors is not important because  
25 it really all boils down to the same basic idea. It's a



1 tradeoff between investment early on or ...

2 That's at the bottom of page 30, right?

3 A Yes.

4 Q Okay.

5 But you did -- even though you say, "The  
6 distinction is not critical," you did, by definition,  
7 narrow your analysis into certain particular things that  
8 you classified as passive solar, or you defined as  
9 passive solar?

10 A Yes.

11 Q On page 32 you are in a discussion about  
12 different passive solar techniques. Are there any  
13 studies which quantify the effect of these various tech-  
14 niques?

15 A Of which techniques?

16 Q Well, of any of them. Has anybody studied  
17 to see how much a shade tree reduces energy demand in a  
18 house and things of that nature?

19 A I think it would be difficult to tell how much  
20 a shade tree reduced energy demand on a house, unless you  
21 knew the size of the window and the size of the tree.

22 Q Well, I understand that. But has anybody  
23 done that type of study?

24 A Not on that type of technique. The roof  
25 pond systems and those hybrid systems that I discussed at

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the top of the page have been subject to experimental design on houses, such as a home in Atascadara, California and the Skyfirm residences, which I believe are in Phoenix.

The studies there ... where existing data exist on those particular buildings ...

- - -

5-1  
cf

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1           Q       Now, on page 33, you are asked, "What  
2 prevents widespread adoption of passive solar techniques?"  
3 And, the first part of your answer is, "A large part  
4 of the problems is that consumers are unable to  
5 determine future prices; largely, because market prices  
6 of gas, oil and electricity do not reflect true cost  
7 of replacing power".

8                   The first question is, how do you know  
9 what consumers know or don't know?

10                   Have there been some studies done on this?

11           A       There would be no way for consumers to  
12 determine future prices, especially, as concerned  
13 the cost of replacement power because then you are talking  
14 about social costs.

15                   Such as, the fair costs involved if -- with  
16 oil that are not restricted to the spot market pricing.  
17 But, additionally, involved the costs of things like the  
18 cost of having hostages in Iran, which are not predictable  
19 but are social costs that we incurred.

20                   We were unable to make them angry at us  
21 because we were afraid we would have our oil cut off.

22           Q       Well, I'm not sure that you answered by  
23 question.

24                   All right.

25                   Have there been studies to determine just

1 how aware consumers are of these price factors?

2 Have there been any surveys or studies done  
3 on this?

4 A There have been no studies done to determine  
5 whether consumers know prices that don't exist yet.

6 Q Well, you -- You would agree that most  
7 people probably know how much they are paying right now,  
8 don't they?

9 A People know how much they are paying now.

10 Q And, would you also agree that most people  
11 probably assume that prices are going to go up?

12 A They may assume that prices are going to go  
13 up. They don't know how much.

14 Q One thing you have already mentioned in  
15 here is that some of these techniques in specific sites  
16 are already economically feasible?

17 That is correct, isn't it?

18 A That is correct.

19 Q Which ones -- well, I know it has to be site  
20 specific to make a determination.

21 Which ones are the most feasible on a  
22 general basis?

23 A You are talking about passive solar cooling  
24 techniques?

25 Q Well, all right, let's go with the passive

5-3

cf

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1 solar cooling techniques.

2 Which ones are the easiest and cheapest to  
3 implement at this time?

4 A. Let me think.

5 Depending on the number of windows that you  
6 may have on southsides of buildings or westsides, it  
7 may be feasible to buy insulated curtains.

8 If you have an awful lot of south-facing  
9 glass, it may not be feasible because they are fairly  
10 expensive.

11 Ventilation techniques, such as using a  
12 ventilation stack on your roof, this involves putting  
13 in a chimney with glass on the southside.

14 Having the glass on the southside of this  
15 chimney heats the air in the chimney, the air rises and  
16 draws air through your house.

17 The feasibility of that depends on your  
18 room placement.

19 If only one room is going to get cooled by  
20 having this breeze blow through, it is not likely to be  
21 economically viable.

22 However, if using your own labor it is a  
23 fairly cheap technique.

24 Q. Okay.

25 Are there any others? Other techniques?

5-4

cf

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1           A       Planting trees. That's very cheap.  
2                    Growing -- planting grown trees is unlikely  
3                    to be feasible.

4                    Most of the other measures I have discussed  
5                    are not passive.

6                    MR. DOHERTY: Mr. Chairman?

7                    I'm not certain that --

8                    JUDGE WOLFE: I'm sorry.

9                    MR. DOHERTY: I'm not certain that this is  
10                    a good time for me to break in.-- it's a good time for me  
11                    to break in, I'm not certain it is worth the Board's  
12                    attention or not.

13                    But, there is starting a roof leak right  
14                    here against the wall.

15                    And, we are the responsible lessees, I  
16                    presume, of the premises, so it seems as if the landlord  
17                    ought to be notified.

18                    JUDGE WOLFE: Off the record.

19                    (Brief discussion off the record.)

20                    JUDGE WOLFE: Back on the record.

21                    Yes.

22                    BY MR. DOGGETT:

23                    Q       The next sentence following the one we have  
24                    been talking about on page 33, says that, "Institutions  
25                    at the federal level prevent the cost of solar equipment

5-5

cf

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1 from reflecting the national security advantages of  
2 decentralized solar power."

3 What does that mean?

4 A. Those advantages are the types of things that  
5 we are speaking of in terms of OPEC nations having and --  
6 from the costs involved -- decentralized solar power  
7 has advantages such as if we were attacked there would not  
8 be one unit that they could wipe out and cut off the  
9 energy supply for New York City, for example.

10 Those kinds of advantages are not reflected in  
11 the costs of solar equipment because the federal  
12 government does not adjust the prices of solar equipment,  
13 other than through their tax refund for some kinds of  
14 energy saving equipment.

15 Q So, you're not referring to any -- well,  
16 are you referring to any specific institutions at the  
17 federal level which are preventing this added benefit from  
18 being --

19 A. No.

20 Q By the word "institution" you are talking  
21 about the system you just described?

22 A. Yes.

23 Q Has that added advantage been quantified in  
24 any studies?

25 A. No.

5-6

cf

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1 Q Incidentally, what Department of Energy study  
2 or data are you referring to in that particular answer?  
3 You say it is according to the Department of Energy, but  
4 there is no footnote?

5 A No. It is referenced under the National  
6 Energy Plan II.

7 They include a discussion there.

8 I don't have the page number, I don't think.

9 Q Is this whole answer on page 33 taken from  
10 that National Energy Plan II discussion?

11 A No.

12 This answer is, also, taken from discussion  
13 by Boyd and Business Horizons, which is also referenced in  
14 the back, as well as from common knowledge.

15 Q Your common knowledge, I assume, is what  
16 you are referring to?

17 A I would suspect that many people hold the  
18 same knowledge on some of these barriers.

19 Q What is the source of the statement that  
20 says, "Ignorance of available technologies is a big  
21 factor"?

22 A That statement comes, I believe, from the  
23 Boyd article.

24 Q Now, is that just -- does he support that  
25 with any type of surveys or data or is that an intuitive



5-7

cf

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1 supposition on his part?

2 A He does not list any data sources.

3 Q Is his material also the source of the portion  
4 of the testimony you're stating that solar advocates are  
5 less likely to have capital?

6 A No. That is my opinion.

7 Q And, what do you base that opinion on?

8 A I base that opinion on such things as  
9 organizations such as TexPirg. is unlikely to have large a  
10 capital available to it.

11 That its funds are made up of donations,  
12 and they haven't got the access to buy commerical time,  
13 and advertise that you should be putting in passive solar  
14 techniques.

15 Q What other solar advocates are there besides  
16 TexPirg and similar organizations?

17 A I would say that in general you are talking  
18 about individuals and not organizations.

19 Q You are aware, are you not, that the  
20 Applicant's conducting public awareness program concerning  
21 conservation and related techniques for saving the energy,  
22 are you not?

23 A I am aware that the utilities are, I believe,  
24 required to send out information on energy conserving  
25 techniques.

cf

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- 1 Q And, what requires them to do that?
- 2 A I'm not sure.
- 3 Q Do you have any idea -- have you talked with  
4 anyone with Houston Lighting & Power about their program?
- 5 A No. I have not.
- 6 Q Do you have any idea how much money they  
7 spend?
- 8 A No.
- 9 Q Do you know of any reason why they couldn't  
10 include information on passive solar techniques in their  
11 public awareness program?
- 12 A No.
- 13 Q Are there any other advocates of solar power  
14 that you know of?
- 15 A You have already asked me that question.  
16 I indicated that they are likely to be  
17 individuals.
- 18 Q Oh. All right.  
19 What about the federal government?
- 20 A I don't believe that the federal government  
21 is taking an advocacy role.
- 22 Q Are you aware of any booklets that the  
23 federal government puts out concerning passive solar  
24 techniques?
- 25 A I know that some are available through

5-9

cf

1 the Consumer Information Center.

2 Q You don't consider that advocacy?

3 A They also bring out numbers of other  
4 techniques.

5 I believe that the federal government's  
6 position is to allow the market to take over and to handle  
7 the diffusion of these technologies.

8 Q Well, I'm not necessarily saying that the  
9 federal government is backing any particular technology.

10 I'm saying --

11 A Well, that's my definition of advocating.

12 Q Well, what you are talking about in your  
13 answer is ignorance of available technologies, not  
14 necessarily supporting any particular technologies;  
15 but ignorance of the choices.

16 A Yes.

17 Q So, well, I think the points been made.

18 JUDGE WOLFE: Note for the record that Mr.  
19 Schuessler has made his appearance at 11:47 a.m.

20 BY MR. DOHERTY:

21 Q Other than the HL&P system, are you familiar  
22 with any other utility's programs for educating the public  
23 on passive solar techniques?

24 A I have received the conservation bulletins  
25 of the utilities in the service areas that I have lived in.

5-10

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1 Q As an expert in this field, do you feel that  
2 this is an effective way to educate the public as to the  
3 availability of these technologies?

4 A I think that it could be an effective way.

5 Q Are you saying by that answer that it is not  
6 now an effective way?

7 That you think it could be improved upon?

8 A I would say that right now passive solar  
9 techniques and information about them has not been  
10 distributed, to my knowledge.

11 At least not to a great extent.

12 Q Have there been any studies as to the  
13 effectiveness of any of these utilities public information  
14 programs?

15 A I don't know of any.

16 Q You go on to, in the same paragraph, you  
17 state that, "Local building codes may discourage use of  
18 passive techniques . . .".

19 Are you familiar with any of the building  
20 codes in the Houston Lighting & Power service area?

21 A No.

22 I am not.

23 Q You couldn't give us an opinion as to whether  
24 or not those building codes have any of the discouraging  
25 effects that you mention in this?

5-11

cf

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1 A No, I cannot.

2 Q Are you familiar with any building codes  
3 in the United States which, in fact, encourage  
4 conservation or passive solar techniques?

5 A There have been some in the form of deed  
6 restrictions in specific communities which require, for  
7 example, underground housing in one area of Knoxville,  
8 Tennessee.

9 Or, -- and there are some areas which will  
10 require conservation techniques by deed restriction.

11 Q What is your understanding of the difference  
12 between a deed restriction and a building code?

13 A Building codes are made up by the  
14 municipality, by the agents of the municipality in the  
15 form of their zoning laws.

16 The deed restriction is made by the owner  
17 of the property when they sell it to another owner of  
18 property, and can require anything in particular that  
19 that individual wants.

20 Q Are you familiar with the Portland, Oregon,  
21 building code which requires -- which will require by  
22 1984, that no house can be sold without having been  
23 properly weatherized?

24 A Yes. And the Davis, California codes. I  
25 didn't think of before.

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Q. That was my next question.

Have you seen any studies or any data which would support your statement that builders may also be faced with disincentive of risk associated with selling passive solar buildings?

A. Would you repeat the question, please?

Q. The last part of your middle paragraph, states "Builders may also be faced with disincentive of risk associated with selling passive solar buildings."

Is that your opinion or is that an opinion taken from one of these citations?

A. That is my opinion; and, I believe, it is, also, in various citations.

Q. All right.

What is the -- other than the citations, what is the basis of your opinion?

A. The basis of my opinion is that a number of people with whom I have spoken, indicate that they think solar homes a funny looking.

And, builders who think that type of house is faddish and is not going to sell very well.

Q. And, who are these builders?

A. I don't know the names.

Q. How many did you talk to?

A. This is personal communication as I was

5-13

cf

1 wondering around the development.

2 There is this one individual, in particular,  
3 that I am speaking of.

4 Q You talked to one builder only?

5 A Yes.

6 Q And, when was this?

7 A This was probably November.

8 Q November, 1980?

9 A Yes.

10 It is not in connection with this study.

11 Q And, where was this?

12 A This is in Knox County, Tennessee.

13 Q And, from your conversation with one builder  
14 in Knox County, Tennessee, in November, 1980, you are  
15 prepared to postulate a nationwide effect for all builders?

16 A From that conversation, from conversations  
17 with real estate agents, from conversations with  
18 consumers, I would be willing to postulate that there is  
19 a disincentive associated with the possibility that  
20 passive solar homes are not going to resell or sell well in  
21 the future.

22 Whether this is true is not necessarily faced  
23 by that statement.

24 Q In other words, this is your opinion?

25 A Yes. As I stated in the beginning.

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1 Q Well, you stated in the beginning of your  
2 answer to me, but you never stated it in your direct  
3 testimony.

4 What I am trying to establish is what is  
5 your opinion, what is the opinion of some other source,  
6 and the basis for those opinions.

7 So that is the reason for all these questions.

8 Now, in the next paragraph, you state that  
9 there may be a disincentive due to the fact that, "lower  
10 rates for all-electric users may disqualify participants  
11 using passive solar techniques".

12 Okay.

13 I understand what you are saying. Do you  
14 have any idea what the policy of Houston Lighting & Power  
15 Company is on this point?

16 A I know Houston Lighting & Power has a rate  
17 schedule that I have seen. An experimental rate towards  
18 conserving houses.

19 I do not know the criterion by which they  
20 choose the people who participate in that experiment.

21 However, I believe, that they do not attempt  
22 to discourage passive solar.

23 Q So, that in all probability as the rates now  
24 exist this particular disincentive would not apply in the  
25 Houston Lighting & Power service area?



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A. As far as I know.

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1 Q Now, the next question put to you in the  
2 direct testimony is "Are there any federal, state or local  
3 regulations in effect which require passive solar  
4 techniques in these structures in the Houston area?"  
5 And, your answer on page 34 is "No."

6 Do you know of any federal, state or local  
7 regulations in effect which would prevent passive solar  
8 techniques in these structures in the Houston Area?

9 A Not that I am aware.

10 Q Did you do any research of the federal, state  
11 or local regulations in the Houston area?

12 A No.

13 Q In other words, this is just a --

14 A This is on the basis of my knowlege.

15 Q But, you didn't check it out?

16 A No.

17 (Pause)

18 Q On page 34 of your testimony, you state that,  
19 "there is no reliable way, at this time, to quantify the  
20 reduction in power demand resulting from conservation  
21 measures."

22 A Which line are you speaking of?

23 Q The lines aren't numbered but it is in the  
24 the last paragraph on that page.

25 A I state that the FSFES in Section S.8.2.6,

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- 1 concludes that.
- 2 Q All right.
- 3 Is that also your conclusion?
- 4 A I don't know.
- 5 (Pause.)
- 6 Q The statement following that statement, is
- 7 that also taken from the FSFES, or is that your statement?
- 8 A That is from the FSFES.
- 9 Q All right.
- 10 A The final statement is my statement.
- 11 Q All right.
- 12 Do you concur in the statement taken from the
- 13 FSFES that, "This is due to (1) the uncertain nature of the
- 14 effectiveness of the measures that may be taken. . . ."
- 15 A If there is no reliable way to quantify
- 16 the reduction, I would expect that to be due to the
- 17 uncertain nature of the effectiveness of the measures.
- 18 Q What about the other two factors, number 2
- 19 and number 3, mentioned there on that page?
- 20 Would those also be factors? In your opinion?
- 21 A I don't have any knowledge on that.
- 22 Q What is substitution effects?
- 23 A Substitution effects, in general, involves
- 24 the -- when prices change on various inputs such as fuels,
- 25 say when the price of oil increases, that implies a change

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1 in the demand for other fuels that are considered a  
2 substitute for it. Such as, there would be increases in  
3 natural gas, or of electricity.

4 Q And, on Item 3, what possible regulations  
5 may require increased electrical demand?

6 A It is conceivable that if oil becomes a  
7 scarce good, or as it is becoming increasingly, that use  
8 of it would be saved for those uses which cannot use  
9 anything else, such as automobiles.

10 They have not yet perfected an electric  
11 automobile, so they may restrict the use of oil to those  
12 good. Therefore, people who are using oil for heating  
13 purposes may be required to switch over to electricity.

14 Likewise, there are many industrial processes  
15 that may be required to make switches in that manner.

16 I don't believe that there are regulations  
17 that require increased electrical demand, currently.  
18 However, that is not an area that I have studied.

19 (Pause)

20 Q Now, you have stated that the last sentence  
21 on that page is your sentence.

22 Did you do an analysis on this --

23 A No. I am acting on reliance on James Dick's  
24 comparison.

25 Q Are you an expert in that particular area?

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cf

1 A In which particular area?

2 Q The area that allows you to draw that  
3 conclusion?

4 A No. I have not studied that area.

5 (Pause)

6 MR. DOGGETT: I pass the witness.

7 JUDGE WOLFE: Mr. Doherty?

8 CROSS-EXAMINATION

9 BY MR. DOHERTY:

10 Q Ms. Johnson, in preparing yourself for your --  
11 for this, did you read the direct testimony of Herbert  
12 H. Woodson?

13 A Yes, I did.

14 Q Now, turning to page 20, you state, "There  
15 are technical, economic, and practical considerations that  
16 make this alternative [that is the use of solid waste  
17 combustion] of questionable value for baseline generation."

18 Yet, when I read page 26 of your testimony  
19 I didn't see anything that supported that statement with  
20 regard to economics.

21 I was wondering, would you, please, give me  
22 some of the economic considerations that make solid waste  
23 combustion of questionable value for baseline generations?

24 MR. DOGGETT: Mr. Chairman, excuse me.

25 I hate to interrupt, but I passed by error. I intended to

6-5

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1 ask the witness questions also on solid waste combustion.

2 Now, I am prepared, if you want to go forward  
3 to go ahead and let him cross on passive solar and then  
4 come back to --

5 JUDGE WOLFE: I think I would prefer that  
6 you proceed to conclusion on your cross-examination on the  
7 two subject matters, Mr. Doggett.

8 All right. Back to Mr. Doggett, then.

9 CROSS-EXAMINATION  
10 (continuation)

11 BY MR. DOGGETT:

12 Q Ms. Johnson, turning to page 20 of your  
13 testimony on solid waste combustion, what -- I believe you  
14 mentioned that you are currently researching the economics  
15 of energy and materials recovery from municipal solid  
16 waste.

17 What is the status of that research?

18 A As I stated during Voir Dire, that research  
19 project has not been funded.

20 Q Then, that research is at an end.

21 Is that --

22 A Yes. As of now.

23 Q How -- when was the funding denied or cut off?

24 A The funding has not been officially denied.  
25 However, we have been led to believe that it will not be

6-6

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1 that it will not be granted.

2 Q Well, how far did you go before you found this  
3 out? What had you done in this research project, or in  
4 preparing for this research project?

5 A As I previously stated, I have gone through  
6 much of the literature on recycling efforts, and the  
7 economics of secondary material use as well as having  
8 begun to study the use of discreet models in order to be  
9 able to use those techniques.

10 I have, also, talked with engineers, well,  
11 an engineer at Babcock & Wilcox on solid waste combustion  
12 plants in order to find out more about those systems.

13 Q Who was the engineer at Babcock & Wilcox?

14 A Stephen Johnson.

15 Q And, when did you meet with him?

16 A I did not meet with him.

17 I have had phone conversations with him.

18 Q Could you tell us approximately what the total  
19 length of time that you spent conversing with him on the  
20 phone?

21 A I spoke with him on this topic in December  
22 for probably 20 minutes.

23 I have had some communication by letter, and  
24 had another conversation the end of January which lasted  
25 probably an hour or an hour and a half.

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1 He told me about the European experience and  
2 gave me the names of people who were working on this area.

3 Q Did you contact any of the people whose names  
4 he gave you?

5 A No. I have not.

6 Q Did you review any of the literature  
7 concerning the European experience?

8 A I have reviewed literature which discusses  
9 the European experience.

10 However, I have not had literature from  
11 those countries.

12 (Pause)

13 Q Now, when you answered the question a while  
14 ago about how far you got, you said that you had reviewed  
15 the literature on recycling and secondary material use,  
16 and I never heard you say anything about solid waste.

17 You never said anything specifically about  
18 solid waste combustion.

19 I want to clear that up.

20 Did you also review the literature on solid  
21 waste combustion?

22 A I believe that I stated before that I have  
23 reviewed literature on solid waste combustion, as is  
24 indicated in part by the reference section to the solid  
25 waste combustion in the direct.



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(Pause to look through document.)

Q In your opinion, how extensive has your review been?

Have you reviewed all the literature, or just selected portions of the literature?

A There is very extensive literature on this subject.

The portions that I have reviewed are but a small section of the available literature on that topic.

Q Did you review any literature that you do not have listed in your source of references?

A I have, although, I cannot tell you names of particular articles.

Q Have you ever visited a solid waste combustion facility?

A No. I have not.

Q Does Babcock & Wilcox operate any solid waste combustion facilities?

A Babcock & Wilcox designed the boiler system for the Ames Island plant, and have designed and, I believe, set up plants in Dade County, Florida, specifically the -- I believe they have the pettetizing process and feed system which they have developed for that system.

They are actively attempting to spread the technology.

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1 Q What other companies, American companies,  
2 are you aware of that are involved in this same field?

3 A I know that Willabrater-Frye has a number  
4 of plants.

5 Somewhere here I have a list of some of the  
6 companies.

7 (Pause to look through document.)

8 According to research recovery in November,  
9 1980, Occidental Petroleum Corporation, Combustion  
10 Equipment Association, Ratheon Service Company,  
11 Black, Closs & Parsons, and Whitemore, Incorporated,  
12 C. T. Ming, Hoarer & Shifrin, Incorporated, UOP,  
13 Incorporated, Jacobs Engineering Company, Metcalf & Eddie  
14 Incorporated, Ralph Parsons & Company, Consort, Townsend  
15 & Associates, Richardson Incorporated --

16 Q That's enough.

17 Did you contact any of these other  
18 companies?

19 A No, I have not.

20 Q Do you know whether or not their  
21 technology compare or are substantially the same as or  
22 similar to Babcock & Wilcox technology?

23 A No. There are a number of different types  
24 of techniques that are currently being developed.

25 Q All right. Did you discuss the economics of

6-10

cf

1 Babcock & Wilcox's system with the engineer from that  
2 company.

3 A The economics of any solid waste system  
4 depend on a number of factors.

5 This engineer believes that their system  
6 is affordable, however, the economics depend to a large  
7 extent on your current costs of disposal of waste and the  
8 distance you have to travel to land fill.

9 Which are, again, more specific to the area  
10 than a company is able to provide.

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1 BY MR. DOGGETT:

2 Q I take it then that the answer to my question  
3 is yes, you did discuss this with him?

4 A To a limited extent that it is possible,  
5 yes.

6 Q Well, now what do you mean, "to a limited  
7 extent that it is possible," were you all prevented from  
8 discussing it any way?

9 A No.

10 As I just stated, the economics of a system  
11 are governed by a number of different factors. The --

12 Q No, I'm not talking about --

13 A You're just talking about the cost of a  
14 system, not the economics?

15 Q No, I'm talking about your discussion. I  
16 want to know the parameters of your discussion. I'm not  
17 talking about general factors or what's involved. I want  
18 to know about your discussion with this engineer. That's  
19 what I'm talking about.

20 A What are you asking?

21 Q I asked you if you had discussed the economics  
22 with him. You said, "To a limited extent to the" --  
23 "To a limited amount" or "To a limited extent" -- "To  
24 the extent possible."

25 I'm trying to find out what you meant.

1           A        We have discussed in general whether they  
2 believe their systems to be feasible. In testimony that  
3 related to the National Energy Plan -- wait a minute --  
4 the Solid Waste Energy Act of '79 --

5           Q        Wait a minute. I just want you to answer my  
6 question.

7           A        All right.

8                    And that's the limits that we discussed.

9           Q        Okay.

10                   And what was his opinion?

11           A        His opinion was that those plants are afford-  
12 able, and that it would be a good deal.

13           Q        Did you discuss Houston with him?

14           A        Pardon?

15           Q        Did you discuss the parameters in the Houston  
16 area with him and ask him for an opinion as to whether or  
17 not a facility would be affordable here?

18           A        No.

19           Q        Now on page 20 in your third answer you  
20 state that "There are technical, economic, and practical  
21 considerations that make this alternative to be of question-  
22 able value for baseline generation."

23                    Now what do you mean by "baseline generation"?

24           A        Are you talking about baseload generation?  
25 That's the same thing.

1 Q You're talking about --

2 A Generation that is going to exist for base  
3 capacity as opposed to a peaking unit is what I'm saying.

4 Q You're talking about large scale central  
5 power generating stations?

6 A Yes, I believe that's what we're discussing.

7 Q Well, did you consider solid waste combustion  
8 as a factor outside of baseline generation?

9 A No. The contention dealt with obviating the  
10 need for Allens Creek, which is designed as a baseload  
11 unit.

12 Q Well ... but the way that solid waste com-  
13 bustion would obviate the need for Allens Creek would be  
14 to reduce the need for electricity.

15 That might not necessarily occur solely  
16 through baseline generation. Isn't that true?

17 A I can't think how you could possibly compare  
18 a peaking unit with a baseload unit...that use of a peaking  
19 unit is going to obviate the need for a baseline unit.

20 Q I don't think I said anything about a peaking  
21 unit. I said -- Let me ask my question again, and you  
22 tell me if you don't understand.

23 To the extent that solid waste combustion  
24 would reduce the need for electrical power outside of any  
25 baseline generation, that needs to be considered, doesn't

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1 it?

2 A Are you assuming that someone other than  
3 HL&P is putting on a solid waste unit?

4 Q Well, I don't think it matters who does it  
5 in the context of my question.

6 What about -- Maybe I can make it clearer  
7 by asking a different question.

8 Is baseline generation the only way in which  
9 you considered the effects of solid waste combustion on  
10 power generation -- for power generation?

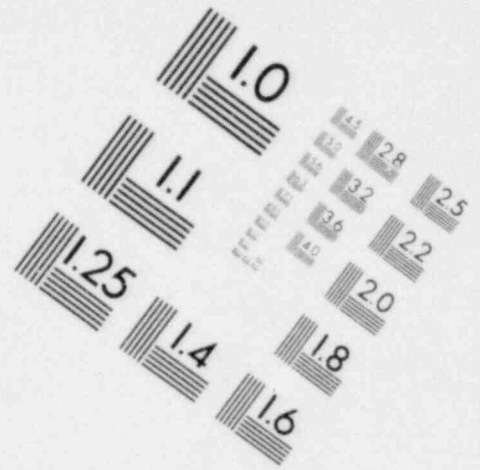
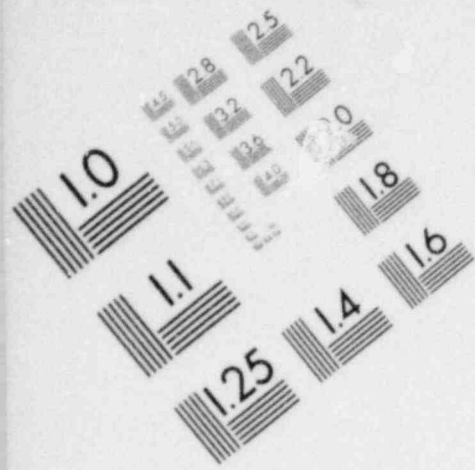
11 A I considered the possibility of using solid  
12 waste combustions for electricity generation. In dis-  
13 cussing it in terms of obviating the need for Allens  
14 Creek, I only considered it as a replacement baseline  
15 generation system.

16 For example, I am assuming that you're using  
17 either Allens Creek or the solid waste in my testimony.

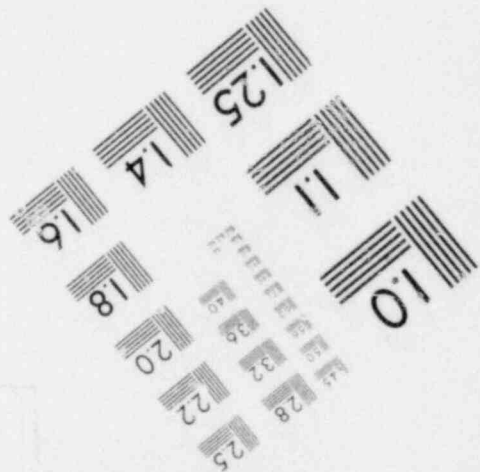
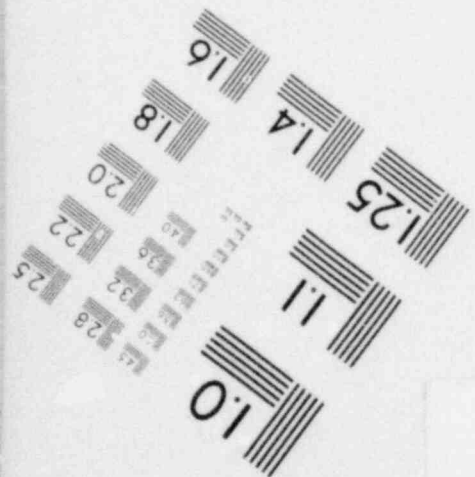
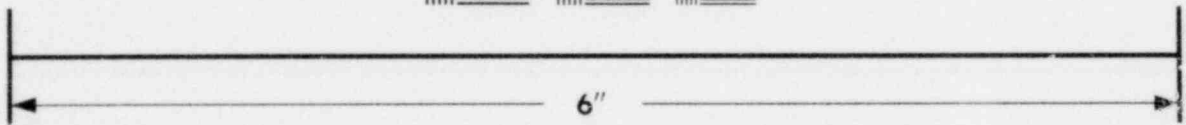
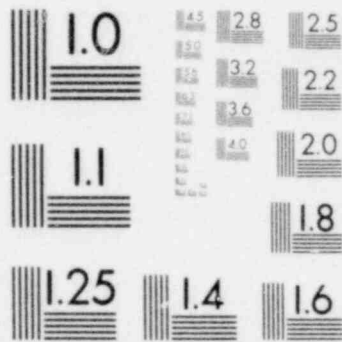
18 Q So you didn't give any consideration to the  
19 effect that solid waste combustion might have in co-  
20 generation activities?

21 A No, I did not.

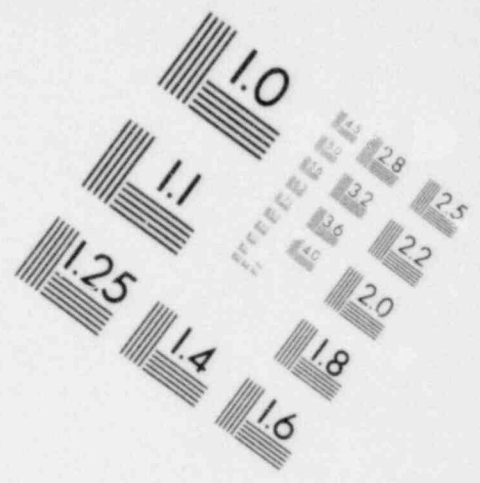
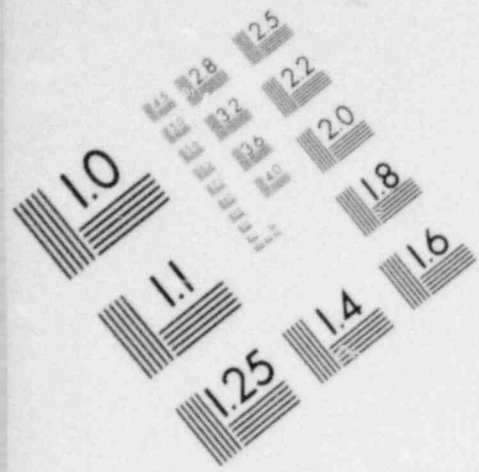
22 Q Have you -- Are you aware of any --  
23 You named a bunch of companies that are in this business.  
24 Are you aware of any utility companies that have gone into  
25 the solid waste combustion field?



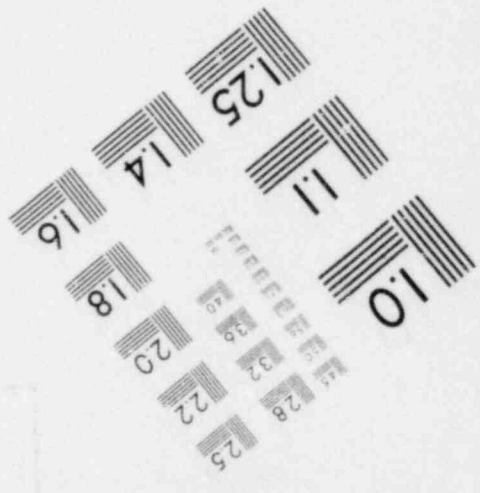
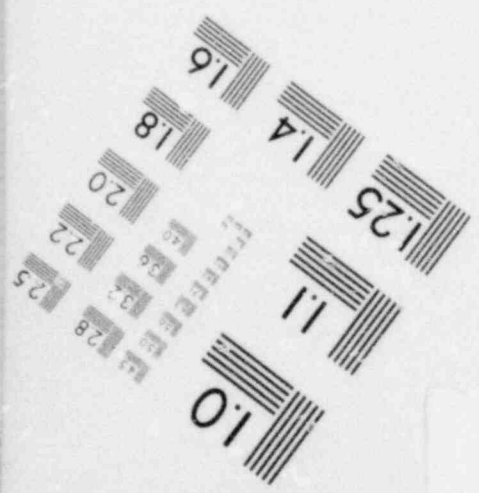
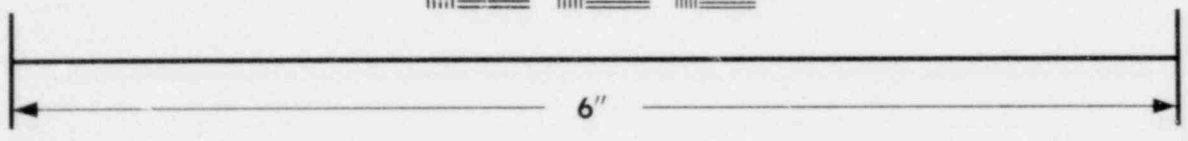
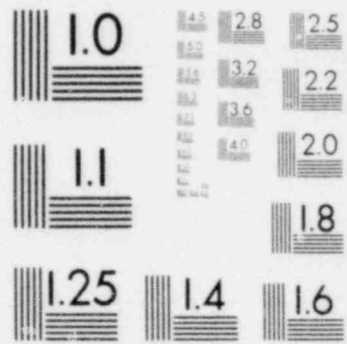
**IMAGE EVALUATION  
TEST TARGET (MT-3)**







**IMAGE EVALUATION  
TEST TARGET (MT-3)**



1           A        I do not believe that I know of any utilities  
2 which -- privately owned utilities that are completing the  
3 entire cycle.

4                    There are some utilities which are buying  
5 steam and turning it to electrical generation.

6           Q        Buying steam generated from solid waste  
7 combustion?

8           A        Yes.

9           Q        And how many utilities are there? Are there  
10 quite a number of them, or is it fairly limited?

11          A        I believe it's fairly limited.

12          Q        Are the names of those companies contained in  
13 one of the citations?

14          A        That would also be contained in the Resource  
15 Recovery materials which I stated when I listed the com-  
16 panies.

17          Q        Now, except for the reference to the Committee  
18 on Energy and Natural Resources Hearings, Municipal  
19 Solid Waste Energy Act of 1979, U. S. Government Printing  
20 Office, 1980, I don't see any references to materials  
21 after 1979.

22                    Are you aware of any new papers or studies  
23 that have come out since 1979 on this subject?

24          A        No, I'm not aware of any.

25          Q        Do you know whether or not there is any

1 material on the European experience that has been --  
2 which was prepared in Europe, but which has been translated  
3 into English, assuming it wasn't written in English in the  
4 first place?

5 A I don't know of any offhand.

6 Q Did you review the plan that had been proposed  
7 by a -- I can't recall the name of the company -- but  
8 the plan that had been proposed for solid waste combustion  
9 in the Houston area?

10 A I knew that there had been a plant proposed.  
11 I have not seen any plans for it.

12 Q Do you know what company was going to do  
13 that?

14 A I believe it was Brown & Root.

15 Q Okay.

16 Do you have any information as to what the  
17 status of that proposal is at this time?

18 A I'm not certain. I believe that they have  
19 decided against that project.

20 Q And what is the source of your information?

21 A My memory of the Woodson testimony, which  
22 was ... which he had prepared. I can look up and find  
23 out exactly whether or not that project is listed and  
24 exactly what it is.

25 Q That won't be necessary.

1                   Now on page 21 of your testimony in the second  
2 answer beginning about the middle of the page, you  
3 point out that the factors which have restricted solid  
4 waste combustion in the United States are lower price  
5 levels and inexpensive waste disposal.

6                   What is the current trend on those two factors  
7 in the United States?

8                   A.       As you're no doubt aware, currently oil prices  
9 have been rising at a tremendous rate, which has led to  
10 the United States beginning to work in this area in the  
11 last decade.

12                   And the growing population, as well as the  
13 Resource Conservation Recovery Act restrictions on  
14 landfills, have made the cost of waste disposal in-  
15 creasing.

16                   JUDGE WOLFE: I think it's time for a recess.  
17 We'll recess until 1:45.

18                   MR. BAKER: May I say something before we  
19 leave?

20                   I'm not certain I will be able to return,  
21 depending on what my boss says when I call him right now.

22                   We're at a problem now, I think, that's based  
23 partly on the Board's February 13th order. I have been  
24 very interested in questioning Mr. Dick on natural gas  
25 versus coal -- versus nuclear, pardon me.

1 I had asked the Intervenors to call me when  
2 they thought they were about an hour from having Mr. Dick  
3 come on.

4 I got that call about ten o'clock, and I came  
5 down here.

6 And now it looks like it may be well into the  
7 afternoon before Mr. Dick comes on.

8 I'd like to leave and come back. But I hate  
9 to do that.

10 Is there any way the Board could inform the  
11 Intervenors --

12 JUDGE WOLFE: We're operating under the old  
13 rule as to the Dick testimony, Mr. Baker.

14 So if you come in before we complete cross-  
15 examination and excuse the witness, you can be taken out  
16 of alphabetical sequence, provided you show good cause.  
17 We're operating under the old rule on the Dick testimony.

18 MR. BAKER: That helps me a whole lot this  
19 time then. I'll probably see you tomorrow then in that  
20 case --

21 JUDGE WOLFE: Well, I don't know when the  
22 Dick testimony will be presented and completed. It might  
23 be completed yet this afternoon. I can make no promises  
24 on that.

25 MR. BAKER: I don't know either, and that's my

7-9

1 problem. I can't afford the time to sit down here and  
2 wait for him to come on and --

3 JUDGE WOLFE: Well, the Board is sorry about  
4 that. But you'll just have to make your connections  
5 with the Intervenors who are calling you and just work  
6 out your timing with them and not with the Board.

7 MR. BAKER: Well, what I'm wondering is, since  
8 the new rule requires us to be here throughout the testi-  
9 mony, is there any way that there could be some more  
10 rigid schedule for the witnesses being here, so that the  
11 Intervenors would know when a given witness was going to be  
12 here and when they were not going to be here, so the  
13 Intervenors could plan their lives accordingly?

14 I speak for the Intervenors in general, and  
15 I'm speaking of my own problem specifically here.

16 MR. NEWMAN: Mr. Chairman, I think the  
17 question that is now being raised is totally academic.  
18 The Chair has already advised that Dick is being examined  
19 under the old rules.

20 It's simply up to Mr. Baker to be sure that  
21 he's aware of when Mr. Dick comes up.

22 MR. BAKER: I appreciate that, but the problem  
23 will come up again; and I think this is as good an op-  
24 portunity as any to discuss that.

25 There are future witnesses that I will want to

7-10

1 question; and I would like in the future to have some kind  
2 of a schedule that would give me a pretty clear idea of  
3 when those people are going to be on so that I can be here  
4 and meet my obligations to sit through the testimony.

5 JUDGE WOLFE: Well, we've ruled before that  
6 that's something that's within your control.

7 You must make the necessary arrangements and  
8 contacts, as I have said repeatedly. When you became a  
9 party, you incurred certain obligations.

10 And one of those obligations was to be here at  
11 all times, because the Board simply cannot run a traffic  
12 control center here.

13 It would be impossible to shift around wit-  
14 nesses, to make arrangements for substitution of cross-  
15 examining ... we tried that for a while; it didn't work.

16 So it's just back -- It's subject to your  
17 control as to -- under the new rules. You assumed obliga-  
18 tions.

19 If you're not going to be here at all times,  
20 then you're just going to have to take the risk that if  
21 you're not here at the time that cross actually begins,  
22 you just won't be able to cross, period.

23 So you're just going to have to make inquiry  
24 from other parties, or other Intervenors, what they  
25 anticipate is the best time for you to come before

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cross-examination begins.

If you're not here, you've waived your right to cross-examine.

That's it, pure and simple.

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7-12

1 MR. BAKER: I tried to do that in this case,  
2 and it failed miserably.

3 I --

4 JUDGE WOLFE: Well, I can't help that. I  
5 can't help it.

6 That's the way -- either that or you be here  
7 all of the time. Now it's one or the other.

8 And I can't help you in between.

9 MR. BAKER: There's no way that the witnesses  
10 could be scheduled in such a way that people knew more  
11 than a couple of days in advance who was going to be up  
12 when?

13 MR. BLACK: Mr. Chairman, we've been trying to  
14 do that ever since the inception of this hearing, is try  
15 to set up schedules of witnesses.

16 And I suggest -- And certainly Staff and  
17 Applicant have advocated that position accordingly, so that  
18 we can plan our witnesses.

19 But Mr. Baker must speak to his fellow Inter-  
20 venors as to what the schedule is, because it's largely  
21 within their control.

22 We would like to set up a definitive schedule  
23 and adhere to it. But we've found that it's just impossible  
24 to do that.

25 So ... we have sympathy to his problems. But

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it's largely under the control of his fellow Intervenors --

MR. BAKER: If I might respond --

JUDGE WOLFE: Would you clarify that, Mr. Black?

I'm aware of it, but I think since you've raised it again, could you be a bit more specific. There has been a total lack of agreement between Applicant and Staff on the one hand as to scheduling ... and the balance of the Intervenors? Is that what you're saying?

MR. BLACK: Pardon? I didn't --

JUDGE WOLFE: Are you saying that there has been a total lack of agreement in the efforts by Applicant and Staff to arrange scheduling of some sort in the past?

MR. BLACK: No. I'm saying that the Staff and Applicant have tried to set forth schedules of witnesses --

JUDGE WOLFE: Yes.

MR. BLACK: And I think that we have largely agreed on those schedules. We've presented them to the Board and the parties.

And those schedules have been submitted and tentatively agreed to, but they have not been finally adhered to because of the intervention and the extent and duration of cross-examination by Intervenors.

And that is why tentative schedules that were

7-14

1 set forth have not been adhered to.

2 That was the only point I was making.

3 I'm saying that I'm sympathetic to Mr. Baker's  
4 concern, and it was something that I raised earlier, that  
5 we should try to adhere to the schedule that we've tenta-  
6 tively set up, not only for purposes of Staff and  
7 Applicant, but also for purposes of Intervenors, such as  
8 Mr. Baker, who must plan their schedules accordingly.

9 And I'm just saying that we would love to ad-  
10 here to the schedules, but we have found it somewhat im-  
11 possible in the past; and that's one of the reasons for  
12 the Board's ruling.

13 And I guess, as you have indicated, Mr. Baker  
14 must take the proceeding as he finds it. And communication  
15 amongst his fellow Intervenors is one of the best ways  
16 now under the current rules to figure out what the schedule  
17 is.

18 MR. BAKER: May I respond to that?

19 I think that the reason you didn't have any  
20 luck adhering to your original schedule was that your  
21 original schedule was optimistic and assumed that there  
22 would not be any Intervenor participation -- or any  
23 extensive Intervenor participation in conducting cross-  
24 examination.

25 And now that you have learned the last month

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1 that there is going to be Intervenor participation an  
2 cross-examining, it seems like you could come up with a  
3 schedule that would include that and could involve working,  
4 cooperating between the Staff and Applicant and myself  
5 (and I assume other Intervenors) could decide how much  
6 cross-examination we have on particular witnesses and how  
7 much detail we want to go into on a particular question.

8 I, for one, would be willing to do that, and  
9 we could come up with a schedule that would be realistic.

10 MR. BLACK: Well, we have tried to do that.  
11 In fact, every time that we have discussed scheduling,  
12 I believe -- Mr. Doherty has always been here, and we  
13 commend him for that.

14 But by and large, Intervenors have not been  
15 present. So we haven't been able to get a handle on the  
16 extent of that cross-examination; or, in fact, whether  
17 there was going to be any cross-examination by particular  
18 individuals or Intervenors at all.

19 So that's another problem that we have faced.

20 So your attendance at hearings can facilitate  
21 this scheduling problem with which you speak of having  
22 problems with now.

23 JUDGE WOLFE: Any more comment?

24 MR. NEWMAN: I would just add to that, Mr.  
25 Chairman, that I think that there is a great deal that the

7-16

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1     Intervenors can do among themselves to arrange th  
2     schedule such that they can all participate.

3             And I think our problem today has been the  
4     problem that Mr. Black has alluded to. And we've asked  
5     how long cross-examination might run. We're told generally,  
6     a day or two by one of the Intervenors -- or in the case  
7     of one witness, I believe somebody said it would take four  
8     or five days to cross-examine the witness.

9             Now it's obviously -- I think the equities  
10    here have to be considered.

11            It's obviously impossible to bring witnesses --  
12    and we are bringing -- truly in our case particularly --  
13    expert witnesses from all over the United States.

14            It is impossible to have them sitting in the  
15    audience for three or four days awaiting the completion of  
16    an indeterminate cross-examination.

17            So it is incumbent on the Intervenors to ar-  
18    range a schedule among themselves allocating the time for  
19    cross-examination in some reasonable fashion so they can  
20    all participate.

21            I think a good part of the problem lies in their  
22    own inability to coordinate their own activities.

23            MR. BAKER: Is Mr. Newman suggesting that the  
24    Intervenors should arrange the schedule?

25            JUDGE WOLFE: Well, to not arrange the

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1 schedule, but to confer with one another and get some  
2 idea as to how much each Intervenor thinks that it will  
3 conduct cross-examination, say, for an hour.

4 Then you would be able to determine, if you're  
5 interested in a contention following that, then you would  
6 know approximately how much time would be taken on cross-  
7 examination; and you would appear an hour before cross-  
8 examination was completed on the contention you weren't  
9 interested in; and then you would be present.

10 MR. BAKER: I have tried to do that. Granted,  
11 Mr. Dick is an exception.

12 But I don't feel it will work any better the  
13 next time.

14 JUDGE WOLFE: Well, we're trying mightily to  
15 make this proceeding work.

16 And we've initiated this new ruling, and we're  
17 going with that.

18 You'll just have to take it as you find it.

19 Now with regard to Dick testimony, we're pro-  
20 ceeding under the old rules, so you can be governed  
21 accordingly by that.

22 So my suggestion is that hereafter you just  
23 keep consulting with --

24 MR. DOHERTY: Mr. Chairman, I have a question  
25 of Applicant's counsel.

7-18

1 Mr. Newman, do you have any witnesses avail-  
2 able today?

3 MR. NEWMAN: Do I have a witness available  
4 today?

5 MR. DOHERTY: Yes, sir.

6 MR. NEWMAN: I believe I can make a witness  
7 available today.

8 I can't assure that. I haven't --

9 MR. DOHERTY: See, this is the kind of dif-  
10 ficulty. I'm trying to schedule a little bit ahead,  
11 too; and I'm wondering ...

12 MR. NEWMAN: It is impossible for me to tell  
13 you just when I can have a witness here, because I am  
14 unable, for example, to get an estimate from Mr. Doggett  
15 as to how long his cross-examination would take.

16 We are just told he would cross-examine, but we  
17 weren't told for how long.

18 This morning, quite frankly, when it appeared  
19 as though things were moving quite rapidly, I encouraged  
20 my co-counsel to determine whether or not we would have  
21 other HL&P witnesses available in the event that the  
22 proceedings moved faster than we thought.

23 Right no. I think we're in the classic situa-  
24 tion of an indeterminate cross-examination, which has gone  
25 on for more than two hours or so on three or four pages of

7-19

1 testimony.

2 And I am loathe to ask an expert witness -- a  
3 person who is very busy, to come down here on the off  
4 chance that Mr. Doggett or one of the Intervenors will be  
5 moving prompt and to the point ... completing his cross-  
6 examination.

7 If you were to advise me that you would exhaust  
8 your cross-examination, more or less at a given time --  
9 three o'clock or four o'clock, I can tell you whether I will  
10 have a witness available and who that witness will be.

11 MR. DOGGETT: Could I respond?

12 JUDGE WOLFE: All right, Mr. Doggett.

13 MR. DOGGETT: This idea of -- and particularly  
14 in reference to me --

15 Generally, this idea of estimating length of  
16 cross-examination has been hurled at Intervenors as an  
17 accusation.

18 I must say that, as a lawyer -- I have been  
19 practicing for six years, I do -- about half of my practice  
20 is trial work.

21 It is extremely difficult to estimate the  
22 length of time of a cross-examination for several reasons.  
23 One is that we don't know what the answers of the witness  
24 are going to be, and what the follow-up questions are going  
25 to be on the answers.



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1           And, two, is we don't have any idea whether  
2 objections are going to be made to the questions and how  
3 long it will take to resolve those questions.

4           When asked, I will usually try to give my best  
5 estimate of what the length of my cross-examination is  
6 going to be.

7           If I don't know, I would rather not say. And  
8 it's just -- It's hard for me, as a person with some  
9 experience in this area, to say whether my cross-examination  
10 will last an hour or half a day or a day. It's terribly  
11 hard to give an estimation.

12           And I assume that it is just as difficult, if  
13 not more difficult, for some of the folks who don't have  
14 any training and experience in this area.

15           So --

16           JUDGE WOLFE: Well, let me make it perfectly  
17 clear that this Board is not about to limit anyone's cross-  
18 examination, if it's pertinent and relevant and  
19 material and directly on point.

20           And I will say no more along those lines.

21           But I think that the Board has done as much as  
22 it can in an effort to expedite this hearing, and at the  
23 same time to preserve the rights of the parties.

24           And further than that, unless I hear dif-  
25 ferently ... some other way of going other than the way

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we've gone in the past, we will proceed under the new rule and people will just have to adjust and will just have to take time off from their work, if they're really concerned about the issues that are framed and drafted in this case. You'll just have to take the time off.

If they're unavailable, that's their choice.

Now that's it pure and simple. I don't know any more than I can add to what I've said in the past.

We'll recess now until two o'clock.

(Whereupon, at 12:50 p.m. the hearing was recessed, to reconvene at 2:00 p.m. of the same day.)

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A F T E R N O O N S E S S I O N

2 2:00 p.m.

3 JUDGE WOLFE: The hearing is resumed.

4 In attendance this afternoon is Mr. Newman  
5 for Applicant, Mr. Black for Staff, Mr. Doherty,  
6 Mr Schuessler, and Mr. Doggett.

7 All right, Mr. Doggett --

8 MR. NEWMAN: Mr. Chairman, I have a  
9 preliminary matter, if I may.10 Just before the close of this mornings  
11 session, Mr. Doherty asked me on the record whether we  
12 had a witness that could be put on this afternoon.13 I advised him that I was making efforts  
14 through co-counsel to have a witness, in fact, I have  
15 arranged to have an HL&P witness available this afternoon.  
16 Dr. Schlicht, on the Impact of the Transmission Lines on  
17 Waterfowl.18 Now, Dr Schlicht here now and waiting; and if  
19 we could get some estimate from the Intervenors as to the  
20 likely length of their cross-examination, I would know  
21 whether to keep Dr. Schlicht waiting.22 And, if they did know exactly when they were  
23 going to be finished, they might have some possibility of  
24 contacting Dr. Marrack, if he wishes to be here for that  
25 cross-examination.

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1 So, I have tried off the record to establish  
2 whether or not cross-examination would be complete.

3 I guess I just ask on the record, do you  
4 anticipate the possibility of winding up cross-examination.  
5 And, I'll ask this of all the Intervenors, of Mr. Black's  
6 panel, including Dr. Dick, or is there no possibility of  
7 completing that today?

8 If I may inquire through the Chair?

9 JUDGE WOLFE: Yes. Mr. Doherty?

10 MR. DOHERTY: Well, it sounds unlikely.

11 I can try to make my best estimate on how  
12 long I will be with Ms. Johnson.

13 It looks like a couple hours is fair.

14 I think, I don't know what is in store for  
15 Mr. Dick, but I do know that there are Board questions to  
16 be asked of both Ms. Johnson and Mr. Dick, and, I believe,  
17 Mr. Schuessler has rights to cross-examine Mr. Dick --

18 JUDGE WOLFE: Yes, Mr. Dick -- Will Mr. Scott  
19 be in to resume his cross-examination of Dr. Dick?

20 Do you know?

21 MR. DOHERTY: Your Honor, I don't know that.

22 JUDGE WOLFE: Did you check, Mr. Doggett?

23 You advised yesterday --

24 MR. DOGGETT: I spoke with Mr. Scott yesterday  
25 afternoon after the hearing, and he, because of the press

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1 of his other business, he wasn't sure whether he was going  
2 to be able to make it. He was going to try. That's all  
3 I know. That's not very definite.

4 JUDGE WOLFE: Well, back to you, then, Mr.  
5 Doherty.

6 MR. DOHERTY: Well, it sounds to me like it  
7 is very, very doubtful that we would do all that in two  
8 hours and fifty-five minutes.

9 I am going on the idea that the Board has  
10 never started a witness after 5:00.

11 That seems to have been like a policy to  
12 try to finish one they have if it is going to run past  
13 5:00, but they don't start a new one.

14 JUDGE WOLFE: Well, why did you inquire of  
15 Mr. Newman, as to whether Applicant had a witness to  
16 present this afternoon, then. May I ask that Mr. --

17 MR. DOHERTY: Probably, my anxiety about not  
18 having prepared any cross-examination for any of the  
19 witnesses other than the gang of four you had so far.

20 JUDGE WOLFE: I see. Then it wasn't --

21 MR. DOHERTY: It was somewhat to illustrate  
22 also the kind of problem that begins to emerge when you  
23 are looking at the end of the day. Will they start  
24 are won't they.

25 I don't even have the testimony with me.

8-4  
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1 JUDGE WOLFE: Well, I don't know whether this  
2 presents a problem or not.

3 MR. NEWMAN: I think this illustrates the  
4 kind of problem you have when you find it difficult to get  
5 it coordinated response from the Intervenors so they can  
6 allocate their time in such a fashion as to get a  
7 particular witness on at a given time.

8 So, as a result, I will excuse Mr. Schlicht --  
9 hearing from the others that there appears to be no  
10 likelihood of completing today.

11 I would also like to put on the record that  
12 I would like to make an inquiry at some point tomorrow  
13 regarding the length of likely cross-examination of  
14 witnesses who will appear on Thursday. Who on the present  
15 schedule, I think, are those witnesses on the Effect of  
16 Transmission Lines of Waterfowl.

17 Because I have a witness who I am bringing in  
18 from out of town on Friday, Dr. Michaelson to testify on  
19 the health effects of high voltage transmission lines.

20 So, I would like to put the Intervenors on  
21 notice now that I am going to ask about the likely  
22 duration of their cross-examination on Thursday, so that  
23 I can schedule or determine not to schedule Dr.  
24 Michaelson for Friday.

25 I would ask that the Board make that inquiry,

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1 with the Board's --

2 JUDGE WOLFE: I think certainly after about  
3 5:00 we will terminate for today.

4 Then, we will discuss the scheduling for  
5 the balance of the week and possibly over into Monday and  
6 see how we are coming along and what has to be done.

7 And, obviously, certainly when the Board asks you  
8 best estimate as to cross-examination, I agree with  
9 Mr. Doggett, there have been times when I, as a lawyer,  
10 anticipated that it would take four hours to  
11 cross-examine someone and it took half an hour and I  
12 was satisfied with what I got and stopped.

13 On the other hand, where I have set 2 hours  
14 I oftentimes run longer than that.

15 I think it's very difficult and I am sure  
16 you appreciate that to, Mr. Newman.

17 MR. NEWMAN: Oh, yes. I appreciate that.  
18 I guess what I would, point out in circumstances,  
19 that there are a couple of lawyers who represent the  
20 Intervening parties, Mr. Doggett and Mr. Scott, and, indeed,  
21 Mr. Doherty, who is just constant participation in the  
22 proceeding, seems to be fully aware at each session.  
23 And, it would seem to me that all of the Intervenors would  
24 in some way consolidate their questions so that they could  
25 be fed into either Mr. Doherty or Mr. Doggett or Mr. Scott,

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1 I think this proceeding could move along a lot faster.

2 And, in addition to that, most importantly  
3 I think we could allay the concerns of people like Mr.  
4 Baker, who feel that they never know when they have to be  
5 here at any particular time.

6 I think that all of this would facilitate  
7 scheduling and is in the best interest of the Intervening  
8 parties. Not to mention the convenience to the Board  
9 and the other parties.

10 JUDGE WOLFE: Yes.

11 Well, I certainly encourage that sort of  
12 consolidated effort. If the Intervenors could agree on  
13 one spokesman, one cross-examiner or two at the most, or  
14 whatever, I would certainly encourage that as a focal point  
15 for Intervenors cross-examination.

16 But, this is up to the Intervenors at this  
17 point to certainly make strides in that direction.

18 Well, all right.

19 We will proceed to cross and get into  
20 scheduling at about 5:00 then.

21 Anything else?

22 All right, Mr. Doggett?

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Whereupon,

KIM ELAINE JOHNSON

a witness herein, having been previously duly sworn and cautioned to testify the truth, the whole truth and nothing but the truth, was examined and did further testify upon her oath as follows:

FURTHER CROSS-EXAMINATION

BY MR. DOGGETT:

Q. On page 25 of your testimony, the second answer starting a little above the middle of the page, you discuss some of the practical problems involved with solid waste combustion. The second sentence of that answer states, "The legal problems may be the most difficult from an electric utility's perspective."

Is that your opinion, or is that the opinion which has been gleaned from the references?

A. This is my opinion. And, it is written in here as a maybe. I'm not saying that this is the utility's most difficult problem, I'm just hypothesizing.

Q. What is the basis for your opinion?

A. The basis for my opinion is that, I believe, it would be more difficult to change laws and get exemptions than maybe to solve a technical problem, such as the problems from environmental sources.

Q. What legal impediments are there, to your

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1 knowledge, which would prevent a utility and a  
2 municipality from entering into a long-term contract for  
3 waste?

4 A I don't have a citation on that.

5 However, I have been told that utilities  
6 are prevented from entering into contracts with  
7 municipalities for a guaranteed supply of waste.

8 Q Who told you?

9 A I can't tell you.

10 That is, I don't know.

11 Q Well, did you know -- Have you forgotten, or  
12 did you not know --

13 A Yes. I have forgotten. I did know at the  
14 time when he told me.

15 Q Okay.

16 Is this someone who worked for the Applicant?

17 A No.

18 This is a person at Oak Ridge.

19 Q Concerning the Houston area, specifically,  
20 do you have any information on this particular problem,  
21 that is the problem of contracting for waste?

22 A I don't understand your question?

23 Q You haven't done any direct research into  
24 the Houston area on this particular problem, that is the --

25 A No. I have not.

8-9

cf

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1 Q That is the contractual or legal problems  
2 involved here?

3 (No immediate response.)

4 Q Did you review any Texas statutory law or  
5 consult with any Texas lawyers as to whether or not this  
6 might be a legal impediment in this particular -- there  
7 might be legal impediments in this particular case?

8 A As my memory serves me, this is a national  
9 impediment; and I did not discuss this with a Texas  
10 lawyer.

11 Q Other than the statement that this is  
12 possibly a national impediment; do you recall any details  
13 as to where this has been a problem in the past?

14 Any particular state or any particular  
15 problem that may have been mentioned to you in this  
16 conversation?

17 A No.

18 (Pause)

19 Q In this last paragraph on page 23, you turned  
20 to the possible environmental problems, and, as Mr.  
21 Doherty has already pointed out, you state that  
22 a generic regulations may be breached occasionally.

23 What is your basis for that statement?

24 A The basis for that statement is that as far  
25 as my knowledge extends in the use of scrubbers, they are

8-10

cf

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1 subject to regular failure.

2 That you're going to end up having puffs  
3 of particulates blown into the air.

4 Q Do you know what the -- well, what  
5 atmospheric regulations are you referring to?

6 A I am referring to any regulations which  
7 prohibit the introduction of levels of pollution into  
8 the environment.

9 Q That includes state or federal regulations?

10 A Yes.

11 Q Have you reviewed any of those regulations?

12 A No, I have not.

13 Q Did the engineer from Babcock & Wilcox  
14 mention to you that this was a problem in their  
15 particular operation?

16 A No.

17 Q The next sentence on page 24 says, .

18 "Additionally, the plant is likely to operate only part  
19 of the time."

20 What is the basis for that statement?

21 A The basis of that statement that utility  
22 may or may not decide to operate seven days a week, for  
23 some of these kinds of operations.

24 They may not want to have everybody feeding  
25 waste into the plant on Sundays.

cf

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Additionally, the trucks bringing in waste may not be available on Sundays.

Additionally, there is likely to be some downtime for cleaning out ash or for routine maintenance.

Q What is the source of your information that the solid waste plant might not want to operate seven days a week?

(Pause)

A I should have that citation in there. I do not seem to be able to find it right now.

Q You can come back to it later if you find it.

Is that the same citation the source of the information that the trucks might not be available seven days a week, or is that a different citation?

A There is no citation on the availability of trucks.

Q Is that your own opinion?

A Yes.

Q And, do you have any basis for that opinion?

A Based exclusively on my experience that collection firms are not operating on Sundays in the municipalities in which I've lived.

Q What about your basis for the statement

8-12

cf

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1 concerning downtime for cleaning, are you familiar with  
2 the usual downtime for various types of solid waste  
3 facilities?

4 A The reference that I was looking for states  
5 that "usually the plants normally are operating 70 to 80  
6 percent of the time."

7 Q Does it say why?

8 A No, it does not.

9 Q Then, that reference does not support your  
10 statement that they wouldn't operate on Sundays?

11 A No.

12 Q Do you have a reference to support that?

13 A No, I have not.

14 Q Now, back to my question about downtime.  
15 Are you familiar with the operating parameters of the  
16 various types of solid waste facilities?

17 A What do you mean by operating parameters?

18 Q Well, do you have any specific reference  
19 that tells you that the plants won't be operating because  
20 of downtime?

21 A The reference that I mentioned stated that  
22 there would be downtime. I'm not an engineer, and I don't  
23 know exactly how the machines are going to operate and  
24 what's likely to go wrong with all of the different types  
25 of machines.

8-13

cf

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1                   However, this is question merely of that  
2 there is a possibility that generation isn't going to  
3 occur daily, and if that is true, then, there may be waste  
4 pileups.

5                   I, also, mentioned in the direct testimony  
6 ways of avoiding the problems associated with that.

7                   (Pause)

8                   Q       Now, the problem of waste piling up is  
9 already a problem, is it not?

10                   In other words, you already have this  
11 problem at landfill sites?

12                   A       Well, the definition of a landfill is  
13 that it includes -- that it is covered over.

14                   However, there are, indeed, problems with  
15 landfills if they are improperly operated, of leachate.

16                   Q       Are you familiar with the recent history  
17 of garbage disposal and landfills in the City of Houston?

18                   A       Yes, I am.

19                   Q       Are you familiar with any -- how did you  
20 become familiar with that?

21                   A       A publication called Disposal Needs and  
22 Practices, I believe, let me see.

23                   Q       Is that referenced in your citations?

24                   A       I believe so.

25                   Q       What was the name of that again?

8-14

cf

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1           A        This is it, Technical Economic Study of Solid  
2 Waste Disposal Needs and Practices.

3                    Yes, it is referenced.

4                    This includes practices in the Houston area  
5 in the -- through the '50's and '60's, I believe.

6           Q        Well, are you familiar with anything that has  
7 happened since 1970 on?

8           A        No, I'm not.

9                    (Pause)

10          Q        Did you discuss with the Babcock & Wilcox  
11 engineer whether or not they run their plant on Sunday?

12          A        They don't run their plants.

13                    They design them and try to sell them.

14          Q        All right.

15                    Y'all did talk about a plant where they  
16 install some type of equipment, correct?

17          A        I talked about plants where they designed some of  
18 the equipment.

19                    I don't know whether they installed it.

20          Q        Did he say whether or not the plant where they  
21 installed their equipment runs on Sunday or not?

22          A        No.

23          Q        Did you discuss with him the problem of  
24 trucks possibly not being available on Sunday?

25          A        No. I did not.



8-15

cf

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1 Q Have you studied the Dade County, Florida  
2 solid waste combustion program?

3 A No.

4 Q Is that a program that is currently in  
5 operation?

6 (Pause)

7 JUDGE WOLFE: Let me inject here.

8 Let the record reflect that Dr. Marrack has  
9 made his appearance as of 2:25 this afternoon.

10 THE WITNESS: As of November, 1980, the  
11 scheduled completion date for Dade County plant is April,  
12 1981.

13 BY MR. DOGGETT:

14 Q Is that a government program, a private  
15 program or a joint government-private program?

16 A The contracts are between Dade County, Parson  
17 and Whitamore, who is the major designer, and Florida  
18 Power & Light.

19 Q On page 25 of your testimony, you discussed  
20 the fact that start-up costs are highly variable.

21 Are you stating that start-up costs are  
22 variable from different situation to different situation,  
23 or that start-up costs between comparable or similar  
24 type situations are highly variable?

25 A I'm saying that the costs of capital

8-16  
cf

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1 equipment through start-up is what I am referring to as  
2 start-up costs. It is highly variable for the same type  
3 of plant.

4 Q Can you tell us what factors or variables  
5 might explain the range of start-up costs?

6 A Are you calling for my opinion on that?

7 Q Yes.

8 A I would think that the variation may result  
9 from on different engineering firms participating with  
10 different levels of experience in the field.

11 From possibility of long delays in  
12 construction due to availability of materials, or -- that's  
13 about all I can think of offhand.

14 Q All right.

15 Did you make any effort to do a rough  
16 calculation of what start-up cost might be for a  
17 facility in Houston?

18 A No, I did not.

19 Q And, the same question, for operating costs  
20 for a facility in Houston?

21 A NO.

22 (Pause)

23 Q Now, on page 26, you point out that one of  
24 the benefits of these solid waste facilities is that they  
25 eliminate the cost of landfill disposal, or, I mean,

8-17

cf

1 general disposal of garbage.

2 And, you cite two figures, \$26 per ton from  
3 Talbot Page; and \$40 per ton from the EPA.

4 Now, in doing -- what I want to establish is  
5 are you merely stating that this is something to be  
6 considered, or are you saying -- are you factoring that  
7 into your analysis as being a plus?

8 In other words, when you figure the costs,  
9 do you add in the cost of building the solid waste  
10 facility and the cost of operating it and subtract out  
11 the savings due to that are mentioned here?

12 A. A company who might be considering building  
13 one of these plants could not do that unless they were  
14 able to make a contract with the community for the waste  
15 and have the community pay them their current disposal  
16 rates to remove it.

17 However, from a social perspective, it  
18 certainly improves the economics of a solid waste energy  
19 plant that it obviates, or it substantially reduces the  
20 need for other types of landfill.

21 There are still many residuals that would have  
22 to be disposed of.

23 Q. So, are you saying that you do, in fact,  
24 subtract out these savings to try to figure the overall  
25 benefit?

8-18

cf

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1 Or, did you do any type of --

2 A I am saying that the -- if the municipality  
3 agreed to pay --

4 Q No, I understood what you said --

5 A -- it improves the economics such that the  
6 electricity could sell at an economic rate, at a comparable  
7 rate to other kinds of processes.

8 Q At the bottom of page 26, you note that  
9 the MITRE Corporation indicates that high size economies  
10 will be the rule, and that the existence of those  
11 economies would reduce the average cost of processing a ton  
12 of fuel.

13 How did Houston fit into the high size  
14 economy picture?

15 Does it fall into that category?

16 A All right.

17 Some of MITRE Corporations results have been  
18 discounted since then.

19 They indicated that there would be economies  
20 of size existing through all ranges of size

21 A 6,000 ton per day plant is approximately  
22 twice the size of any other plant that has existed.

23 Other sources since then have indicated that  
24 the economies of size may only increase up to a level of  
25 1,500 tons per day to 2,000, which, of course, doesn't

8-19 1 mean that it would be more expensive to have 6,000 tons  
cf 2 per day produced.

3 It may be that you'd make three plants of  
4 2,000 ton per day size instead.

5 Q Well, that's great, but it doesn't answer  
6 my question.

7 Where does Houston fit in?

8 A As I said, the size of Houston's waste load  
9 would be very large.

10 Q But, you don't know how many plants they  
11 build is what you are saying?

12 Instead of building one, they might --

13 A Oh. I see what you're saying -- I said that  
14 they might choose to build three smaller ones rather than  
15 one big one.

16 They probably would be able to achieve any  
17 size economies that exist, however.

18 Q Did you perform the calculations on page 27?

19 A Yes, I did.

20 Q Okay.

21 Where did you get the formula?

22 A That formula is not much of a formula, really.

23 All this does is it subtracts out from your  
24 starting 6,000 tons per day of waste, all of the non-heat  
25 waste --

cf

1 Q Well, now wait.

2 I asked you where you got it, I didn't ask  
3 you to explain it to me.

4 First, tell me where you got it?

5 A I -- it seems to ridiculous to ask where you  
6 get a method for taking out things that aren't burnable.

7 I originally saw someone taking out things  
8 that were burnable and the disposition by the Intervenors,  
9 as I stated this morning.

10 MR. DOGGETT: Mr. Chairman, I would ask what  
11 you instruct the witness, please, just to answer my  
12 question.

13 I don't think she is doing that.

14 I asked her where she obtained her formula  
15 from.

16 It is a very simple question.

17 JUDGE WOLFE: Yes.

18 Would you answer the question directly,  
19 please?

20 THE WITNESS: I responded that I first saw  
21 a formula of that type used in the Intervenors testimony  
22 as a response to HL&P in November of '78, I think it was.  
23 It was Craig Skie's report, I believe.

24 MR. BLACK: Can I shed some light on this.  
25 I don't think it is testimony that she is referring to.

8-21

cf

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1 I think she is referring to a deposition  
2 that HL&P conducted of Craig Skie, which is reflected  
3 in the November deposition.

4 I think that should be stated on the record.

5 JUDGE WOLFE: All right, thank you.

6 BY MR. DOGGETT:

7 Q Now, on the bottom of page 27 after  
8 calculating this high and low figures, you state that  
9 some adjustments need to be made, and you say,  
10 "For example, we expect that a twenty percent moisture  
11 content is too low."

12 - What is the basis for that statement?

13 A That's just based on reading some literature.

14 The 80 percent dry material figure was  
15 seen in one reference.

16 However, in most references, you are more  
17 likely to have 30 percent moisture content, instead.

18 Q Do you have any idea what the average moisture  
19 content of the garbage is in Houston?

20 A No.

21 Q Do you have any idea where you could get that  
22 information?

23 A I don't think that information would be  
24 available.

25

- - -

9-1

1 BY MR. DOGGETT:

2 Q And, again, I assume your answers are the  
3 same for the -- your statement about the BTU per pound  
4 ratio?

5 A Yes.

6 The BTU per pound calculation is given on  
7 another page.

8 Q I'm talking about this specific information  
9 in the Houston source.

10 A Yes, that specific information is taken from  
11 the highest and lowest figures that I have seen in the  
12 literature.

13 Q On page 28 of your first full answer, you  
14 state that a 6000 TPD MSD plant could produce as much as  
15 one-half this amount of power, but probably would produce  
16 approximately one-third the electricity of ACNGS.

17 What is the basis for your reduction from one-  
18 half to one-third?

19 A The basis for that reduction is the response  
20 to the question just previous to that, and the calculation  
21 of the number of kilowatt hours that would be produced  
22 by Allens Creek.

23 MR. DOGGETT: I pass the witness.

24 JUDGE WOLFE: Mr. Doherty.

25 ///



1 BY MR. DOHERTY:

2 Q I guess we'll start on page 20 if you want to  
3 go back to that. I guess I should say that we'll start  
4 again.

5 Now I think I asked you--but you never had a  
6 chance to reply -- a question about your statement  
7 regarding the basis of your conclusion with respect to  
8 Staff's conclusion on the alternative of solid waste.

9 Q I asked you: What are the economic considera-  
10 tions that make the solid waste combustion alternative  
11 of questionable value for baseline generation.

12 A Part of the economic considerations are on  
13 page 25 of the direct testimony.

14 Other economic considerations -- the things  
15 that are of major importance in determining the viability  
16 of a solid waste energy plant are the distances you have  
17 to travel for landfills, the value of the land for other  
18 sources --

19 Q Excuse me. Distances you have to travel for  
20 landfill?

21 A Yes.

22 If you're trucking waste from the center of the  
23 city out to a landfill area on the outskirts of the city,  
24 then there are costs incurred in terms of fuel.

25 Q Yes, I agree with that.

1 But why does that make the use of a combustion  
2 solid waste combustion alternative of questionable value?  
3 That would seem to enhance that.

4 A Yes, if they are large, it does enhance  
5 that.

6 If it is very easy to dispose of your waste  
7 through other methods, then you're not going to be able  
8 to get a municipality to pay very much for you to take  
9 over that chore and --

10 Q Is it your belief --

11 A -- the economics of this plant depend  
12 crucially on being able to pick up money from the muni-  
13 cipality.

14 Q Is it your belief that at this time it's easy  
15 for the City of Houston to dispose of its solid waste?

16 A Houston is having increasing problems, I believe,  
17 with that. Apparently they are having to go increasing  
18 distances from the city in order to be able to come up with  
19 any kind of landfill at all.

20 And the city is growing at a very rapid rate,  
21 making the land at the edges of the city more and more  
22 valuable for other uses.

23 Therefore, the economics of solid waste plants  
24 for the City of Houston are probably becoming increasingly  
25 attractive.

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Q Yes. That's why I don't understand what this questionable value is all about. That's what I'm trying to get at, why you say --

A Well, I was not aware of the specifics of the City of Houston at the time the testimony was prepared.

The economics are questionable, depending on the levels of other costs.

And I still do not know what a plant would cost in Houston, nor do I know exactly what you would be able to extract from the City of Houston, in order to remove them from the responsibility of disposing of the waste.

Therefore, I cannot assess even at this time whether or not the plant would be economic to bring on line.

All I can tell you is that if it is not, it is moving in that direction.

Q You say it's moving in the direction of becoming more economic?

A If it is not already economic, it is probably moving in the direction of becoming economic.

I don't know whether it will ever get there, however. I don't know the specific cost figures.

Q I guess I don't think anybody knows that.

Is it then sort of a bottom line statement that the only economic consideration that makes the alternative

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of questionable value is uncertainty?

A. Yes, I would say that that is major.

Q. Is there anything else?

A. In addition to those things that I've already stated?

Q. Yes.

A. No, not that I can think of.

Q. All right, thank you.

Moving on down, at the foot of 20, you're speaking there about the extreme variability in the heating value of municipal solid waste.

What is the heating value? What does that mean, first of all?

A. That's the amount of energy that's embodied in the waste as it exists.

Q. I see.

Have you ever heard another term for that?

A. Pardon?

Q. Have you ever heard another term for that?

A. No, not that I know of.

Q. How is heating value measured? In what units is heating value measured?

A. In Btu's per pound.

Q. Okay.

What are the ranges of heat content in municipal

9-6

1 solid waste?

2 A As you see in the testimony on page 27, I have  
3 seen ranges -- Well, actually I have now seen ranges a  
4 bit lower than the 5000 Btu's per pound.

5 I've seen them as low as 4200 Btu's per pound,  
6 I believe, to 8500 Btu's per pound.

7 I have seen sources which give higher amounts,  
8 but they're usually talking about separated waste.

9 Q All right.

10 You also state at the foot there that waste  
11 varies from day to day.

12 Now what causes this variation?

13 A Well, day-to-day variation can only be seen  
14 if the municipalities are picking up the waste frequently.  
15 On weekends you find more beer cans and bottles in the  
16 waste.

17 And on Monday morning you find that you've got  
18 your Sunday newspapers added in there that's more.

19 If waste is being picked up once a day -- I  
20 mean once a week, excuse me -- then you are not going to  
21 find day-to-day variations unless there are perhaps socio-  
22 economic categories.

23 Q Now then, you also say seasonally. Would that  
24 be reflecting the -- say, more rapid beer consumption in  
25 the summer, or what would that be?

9-7

1           A       Perhaps. Or the fact that in the summertime  
2 you're mowing your lawn, and in the fall you have got your  
3 leaves to rake up.

4                    During Christmas time you have a lot of paper.  
5 That sort of variation.

6           Q       At least one week in December you'd have a  
7 lot of paper.

8                    Okay.

9                    What are the main technical problems? Just  
10 briefly. I don't think this has been covered by any  
11 testimony -- with waterwall incineration.

12                   Did anyone ever --

13           A       All right. I am, again, not an engineer.

14           Q       Did anyone mention to you even just --  
15 I'm not an engineer either. So you can help me ....

16                   Did anyone mention what were the source of  
17 breakdowns, the biggest problem they ever had?

18           A       There's quite a bit of problem with corrosion  
19 because of plastics, especially when it's very difficult  
20 to separate out the -- I think they're PVC plastics. I'm  
21 really            all sure.

22                   -- from other kinds of plastics. And plastics,  
23 in general, increase the heating value of the waste.

24 In general, it's undesirable to hand pick out the plastics.

25                   But some of them will cause a tremendous amount

9-8

1 of corrosion.

2 Apparently, Germany has had a terrible problem  
3 with that. And I think they may have it solved.

4 Q You think what? I'm sorry.

5 A There are engineers in Germany that feel they  
6 may have the corrosion problem solved by varying the  
7 temperature at which the waste is fired.

8 Now this again is material that I derived from  
9 my engineer at Babcock and Wilcox.

10 From what he has told me, the waste is very  
11 sensitive to the temperature at which it is burned, and  
12 that a matter of a hundred degrees made a big difference;  
13 they found a lot less corrosion at a slightly higher  
14 temperature.

15 Q All right.

16 Now you mentioned some other technologies,  
17 including pyrolysis. Are any of the European systems that  
18 you either discussed with anyone, or read about, are any  
19 of those pyrolysis systems?

20 A The ones that I'm even vaguely aware of are  
21 not. I don't know -- I suspect that they have some  
22 now.

23 But I do not know of any specific ones.

24 Q Uh-huh.

25 Did you have the impression as you reviewed

1 this material to reply to this contention, that the con-  
2 tention had in mind a waterwall unit?

3 A. Would you repeat that, please?

4 Q. Did you have in your mind when you reviewed  
5 for preparing this testimony, that the contention wanted --  
6 or the contention had in mind also a waterwall system?

7 A. My particular feeling was that the waterwall  
8 types of technology are the best in terms of reliability  
9 and length of experience in using them.

10 Therefore, I concentrated on that waterwall  
11 incineration unit.

12 I don't believe that I judged the contention  
13 to only be addressed to waterwall incineration, however.

14 Q. Moving on to page 23, you then moved into  
15 discussing the practical problems.

16 I'm a little troubled with the answer to the  
17 second question on the page about a plural there. You  
18 said "We would classify them."

19 Is that just an error on your part? Kind  
20 of --

21 A. We wrote this as a panel. The testimony was  
22 supposed to be presented as a panel.

23 Q. All right.

24 Now you state in here, "If a supply of municipal  
25 solid waste cannot be guaranteed, the utility may have a



9-10

1 plant without a fuel source." Isn't that true of any type  
2 of plant that uses fuel?

3 A Yes, that's true.

4 Q Okay.

5 I also was a little troubled by the statement,  
6 "In order to be able to utilize MSW, the utility may have  
7 to enter into the waste disposal business." Why would they  
8 have to do any more than simply take rubbish to the plant  
9 gate?

10 A Well, there are currently businesses which  
11 have contracts to collect, transport and dispose of the  
12 waste.

13 So in some cases a company does only the  
14 collection and transportation, and then leaves it to another  
15 company who has the contract to dispose, in which case  
16 this would not necessarily be a problem. You would only  
17 be competing for the disposal contract.

18 However, if the competing companies are  
19 currently doing all three of those tasks, they may be un-  
20 willing to cooperate with you in providing two of the  
21 tasks and leaving the disposal task only to the utility.

22 Q Do you know any instance where this has  
23 happened?

24 A No.

25 Q Do you know of any utility that is currently

9-11

1 collecting and transporting trash that it is burning?

2 A. Not to my knowledge.

3 However, typically, these plants have been  
4 operated by municipal electric companies, I believe, to a  
5 large extent, such that the town itself has responsibility  
6 already for the waste disposal, as well as responsibility  
7 for generation.

8 Q. So you know of no private utility that col-  
9 lects trash and brings it to --

10 A. No, I do not.

11 Q. -- such a plant?

12 Do you know any state regulatory commission  
13 that has ever prevented a utility from undertaking a task  
14 so far removed from its responsibility to provide  
15 electricity?

16 I'm quoting from you there.

17 A. Yes, I see.

18 I cannot say a specific regulatory commis-  
19 sion. However, I know that commissions have in the past  
20 prevented utilities from undertaking tasks with their  
21 monopoly power that --

22 Q. Say it again.

23 A. -- that are currently being done competitively.

24 Q. I missed some of what you said. I'm sorry.

25 A. I said that regulatory commissions have in the

1 past, I believe, prevented utilities from undertaking tasks  
2 that competitive firms were previously doing because the  
3 utility has monopoly power in the area.

4 And I think that falls under restraint of  
5 trade, or something. I'm really not sure.

6 Q Yes, okay.

7 Let's move ahead a little here. What did you  
8 mean in your reply to Mr. Doggett's question a few minutes  
9 ago about regular failure of scrubbers?

10 A Could you repeat?

11 Q Yes. I can probably ask it better, too.

12 In your reply to Mr. Doggett's question ten  
13 minutes ago or so, you said there were regular failures of  
14 scrubbers.

15 What is the failure rate of scrubbers?

16 A I do not know the failure rate.

17 Q Do you know that the failure is regular?

18 A I have read that the failure is regular to  
19 the extent that it happens frequently, not regular to the  
20 extent that it happens every three weeks or every four  
21 weeks, or anything of that nature.

22 Q What is your impression of how often it hap-  
23 pens?

24 A I have no way of having any impression of how  
25 frequently.

9-13

1 Q All right.

2 From what literature source did you obtain  
3 this opinion (I guess) that there are regular failures of  
4 scrubbers?

5 A I believe that was in the Energy Alternatives  
6 Comparative Analysis.

7 Q So that was in 1975. Is that right?

8 A Yes.

9 Q Did you review anything more up to date than  
10 that?

11 A No, I have not.

12 Q -- to confirm that?

13 All right.

14 Now you've also -- Didn't you mention that  
15 you had read or -- had read a proposal of Brown & Root's  
16 with regard to the burning of municipal trash?

17 A No, I stated that I had not seen their pro-  
18 posal.

19 Q You had not seen the proposal. Is that what  
20 you said? You did not see it?

21 A Yes.

22 Q You have never seen that.

23 Referring to page 24 near the top, you state:  
24 "Additionally, the plant is likely to operate only part  
25 of the time.

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9-14

1 Now do you think that condition could be  
2 eliminated or alleviated by the use of several boilers?

3 A I think that any time that you're using several  
4 boilers, you're going to be improving your reliability.

5 Q All right.

6 Going down on that page some more, we get to  
7 institutional problems. That sounds a bit like a catch-  
8 all.

9 You state: "The United States has not been  
10 able to change peoples (sic) habits to any significant  
11 degree" with regard to trash separation.

12 Do you know anyplace in the United States  
13 where trash separation was ever mandated?

14 A Yes. One of the towns in Massachusetts, I  
15 think it may have been either Saugus or Braintree, mandated  
16 on an experimental basis separation of trash. I'm saying  
17 it was on an experimental basis, because I believe that  
18 they have since withdrawn that requirement.

19 If I remember correctly, they were able to  
20 achieve a maximum participation rate of somewhere around 25  
21 percent.

22 Q Do you know what they were aiming for?

23 A Well, the mandate covered all of their house-  
24 hold trash. I would assume that they were hoping for a  
25 hundred percent participation.

9-15

1 Q All right.

2 Do you know if they have a municipal solid  
3 waste power plant in Saugus (I guess you said), Mass?

4 A Yes, they have.

5 JUDGE WOLFE: There will be no smoking in the  
6 audience, please.

7 BY MR. DOHERTY:

8 Q Well, do you know of any states that permit  
9 deposits on items which would normally go into a pool of  
10 trash?

11 A Oh, yes. Vermont and Oregon. And I'm not  
12 sure if there are any others now -- oh, and Connecticut --  
13 have allowed deposits on glass materials ... at least on  
14 some beverage containers.

15 Q All right.

16 You seem pretty familiar with those. Do you --  
17 Can you give me an idea of how successful that separation  
18 is?

19 A The opinion is rather varied on that topic.  
20 The material that the states give out say that their  
21 efforts have been highly successful.

22 I'm not sure, however, whether they are  
23 talking about successful in terms of removing the most  
24 glass from the waste stream, or whether they're talking  
25 about successful in terms of the other objectives of those

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programs, which were a reduction of litter mainly; and sometimes they're talking about increases in jobs.

So I ... I don't think that the aim of those deposit laws is to remove glass from the waste stream, as much as it is to remove it from the litter stream.

- - -

1 Q All right. What materials do those laws apply to?

2 A Those that I know about apply to glass bottles,  
3 and I believe aluminum is covered in at least some of the laws.

4 I really am not certain on that, however.  
5 This applies only to beer and soft drink containers.

6 Therefore, that doesn't remove mayonnaise  
7 jars, or anything else.

8 Q All right. I would like to move on to Page 25.

9 Now, you talk here about start-up costs  
10 differences. And you state that TexPirg made an attachment  
11 to a response to HL&P first interrogatory number five.

12 Now, do you know where TexPirg got their  
13 information from?

14 A Yes. The attachment is from Solid Waste Management  
15 Resource Recovery Journal.

16 I believe their attachment was October of  
17 1978, perhaps.

18 Q I see. And did you make any attempt to verify  
19 those figures?

20 I will let you look, if you wish.

21 A Yes. I have a copy of the November 1980 version  
22 of the same document, which is an update.

23 The date on the attachment from TexPirg was  
24 September of '78.

25 Q You said "September of '78"?



10-2  
1 A Yes. It was.

2 Q All right. Well, in your testimony -- it may be  
3 a small point -- I believe it says March 27, 1979.

4 A That is when the interrogatory response was brought  
5 out, not the date of publication --

6 Q Well, my --

7 A -- for the source.

8 Q -- mistake.

9 Now, can you give us any more up-to-date  
10 information for that update that you have before you?

11 A There is more information. It would take me a  
12 bit of time to calculate out '78 for a 1000-ton per day plant.

13 Q All right. Well, I won't subject you to that,  
14 then.

15 Moving on to Page 27, on the calculations  
16 that are provided there you stated those came from -- you  
17 stated the formula came from a response to interrogatories  
18 by TexPirg.

19 A Yes, which my attorney tells me disposition. Mr.  
20 Black is my attorney.

21 MR. BLACK: Deposition.

22 THE WITNESS: Deposition.

23 BY MR. DOHERTY:

24 Q Do you know the qualifications of the person who  
25 set those formula down?

1           A.     If I am correct in assuming that, Mr. Skie is the  
2 person who did it has a Bachelor's Degree in Biology, Economics,  
3 and Business Administration.

4                     However, it does not take any qualifications  
5 to subtract out the quantity of metals and glass from the total  
6 waste.

7           Q     Well, let's not go into that just yet.

8                     When you received this, and did this  
9 calculation, did you know that Mr. Skie had done this?

10          A.     Yes.

11          Q     You knew he was the author at that time?

12          A.     Well, if I am correct in my belief that Mr. Skie  
13 is the author, I do not have the material from which this  
14 method is taken on hand, so I am not certain that he is indeed  
15 the author of that.

16          Q     I believe you stated a moment ago --

17          A.     I said that I believe that if I was correct in my  
18 belief that he was the author that those were his qualifications.

19          Q     Now, let's go through that again. If you were  
20 correct in your belief that he was the author --

21          A.     Yes.

22          Q     -- then what?

23          A.     Then I just finished with those were the  
24 qualifications that he had. I am responding to your -- you had  
25 previously asked me a question on the qualifications of Mr. Skie.

1 Q Did you know that Mr. Skie had done these before  
2 you did any of these calculations at all?

3 MR. BLACK: I think she has responded to that. I  
4 object as asked and answered.

5 MR. DOHERTY: I don't think she replied to that  
6 question. I think that --

7 JUDGE WOLFE: All right. No harm then.

8 Will you answer the question, please.

9 THE WITNESS: Would you repeat it, please?

10 MR. DOHERTY: Perhaps the recorder could repeat  
11 it this time. I want to get it accurate.

12 (The pending question was read by the  
13 reporter as follows:

14 "QUESTION: Did you know that Mr. Skie had  
15 done these before you did any of these  
16 calculations at all?")

17 THE WITNESS: I knew that the author was from the  
18 Intervenor.

19 Since I am not certain that Mr. Skie was indeed  
20 the author, all I can tell you is that I did know that it was  
21 the Intervenor.

22 I cannot tell you that I knew that it was  
23 Mr. Skie.

24 MR. DOHERTY: All right. Thank you.  
25

1 BY MR. DOHERTY:

2 Q Now, moving into the calculations themselves,  
3 rounding off a little bit, you state was the calculation 1.,  
4 8.89 times ten to the eight kilowatt-hours per year.

5 And then in number 2. you say 3.89 times to  
6 the ninth kilowatts per year.

7 Can you give me that in megawatts?

8 A A megawatt is just a thousand kilowatts. So if  
9 you move a decimal point down, or, you know, so that 3.89 times  
10 ten to the ninth kilowatt is 3.89 times ten to the sixth  
11 megawatts. And that is megawatt hours.

12 If you want megawatt electric, I have  
13 calculated that for a couple of my cases earlier today.

14 Q Isn't it your testimony on Page 28 that a municipal  
15 solid waste plant could produce 341 megawatts electric?

16 A Approximately. I was going on the basis of  
17 kilowatt hours at this point.

18 However, if you divide through first by a  
19 thousand so that you are in megawatt hours, instead of kilowatt  
20 hours, then by the number of hours in the year you will come  
21 up with figures that will tell you the number of megawatts;  
22 exactly the opposite of what I did in converting the Allens  
23 Creek Plant from 1146 megawatts to a number of kilowatt hours  
24 per year.

25 The 2 billion figure works out to 228 megawatts.

- 1 Q Which 2 billion figure are you speaking about?
- 2 A On Page 28 at the top.
- 3 Q All right.
- 4 A This is the expected approximation of the amount  
5 of energy that would be available from a solid waste plant.
- 6 You take that 2 billion and divide it by  
7 8760, which is the number of hours in a year. Then you come up  
8 with 228 megawatts.
- 9 Now, if you consider that the capacity may  
10 be different than 310, you may also want to divide by some kind  
11 of a capacity factor, which would increase the net amount  
12 slightly.
- 13 Q What is the 310 you mentioned a minute ago?
- 14 A I'm sorry. It is 325. This is days per year of  
15 operating. I am using that as an approximation of the capacity  
16 of the system, of the capacity factor of the system. I'm sorry.  
17 Which at 325 days a year means that it is operating 90 percent  
18 of the time, nearly.
- 19 Q Is that part of your basis on Page 28 that a  
20 6000 TPD MSW could produce as much as one-half --
- 21 A Yes. That's --
- 22 Q -- a certain amount --
- 23 A -- the one-half.
- 24 Q -- but would probably produce one-third?
- 25 A Yes. I'm just comparing the three numbers -- the

1 highest case, which is the 3.89 times ten to the ninth kilowatt  
2 hours a year.

3 The 2 billion kilowatt hours per year are on  
4 the top of 28, and the 6.02 times ten to the minus kilowatt per  
5 year, which is the amount that Allens Creek could produce.

6 That's all that comparison is. And it is  
7 just a rough comparison.

8 Q How were the conversion efficiencies picked for  
9 Case 1 and Case 2? Where did you find these?

10 A Those are in the references. They are the author's  
11 varied opinions.

12 Q Any particular reference or --

13 A I'm trying to see whether I can find --

14 Q I see. All right.

15 A -- a particular reference for each particular  
16 number.

17 Q All right.

18 A These are just high and low cases.

19 (Pause)

20 I can give you an example, if you like.

21 Q All right.

22 A Office of Technology Assessments.

23 Q Say again.

24 A Office of Technology Assessment reference, which is  
25 on Page 29 states that the conversion efficiency of organic

1 waste generation is likely to be approximately the same as if  
2 they were a fossil fuel plant, 35 to 38 percent.

3 Q Now, it would be valuable to me to know where you  
4 got the higher figure, the .59, in order to show the feasibility  
5 of this type of alternate energy.

6 A I don't think I can give you the specific source of  
7 the .59 figure at this time.

8 Q Oh, I see.

9 Now, why is it necessary to include -- Well,  
10 I have a problem here with a figure where you give the, I believe  
11 you call it something else, but it is the contents is the term  
12 used.

13 (Pause.)

14 Are you ready, or are you still --

15 A No. Go ahead.

16 Q I don't want to rush you.

17 Where you have the heat content 5000 Btu's  
18 per pound, and then you have a series of small constants,  
19 combustible material .8, dry matter .6.

20 The other figures are simply conversions to  
21 get from pounds to tons, or pounds per ton, tons per day --

22 A Right.

23 Q -- apparently.

24 Now, why -- I don't understand why you  
25 simply don't go directly from the Btu's of the material that

1 you have.

2 A. Because the Btu's for the material that you have  
3 is fine. However, that 6000 tons that you have is not 6000  
4 tons of burnable waste.

5 Part of that tonnage is made up of water,  
6 which does not burn very well, and provides no energy to the  
7 system. As a matter of fact, it reduces the energy to the  
8 system.

9 And part of that tonnage is metal and glass,  
10 which has to also be removed.

11 Q. Well, then are you certain that these figures,  
12 5000 and 8500 reflect a trash sample which includes combustible  
13 material and dry matter?

14 A. Yes. They do.

15 Q. All right.

16 A. If they did not include those figures, then the  
17 actual figures I would have to use would be much lower, since  
18 I am including those materials.

19 Q. All right. Well, is it the bottom line of your  
20 conclusion of your testimony then that such a plant using 6000  
21 tons per day could produce approximately one-third of the power  
22 of the Allens Creek nuclear generating station?

23 A. I believe that that is a likely value.

24 Q. All right. Then I have completed this part of the  
25 cross-examination on this particular contention.



1 MR. DOHERTY: Should I move on?

2 JUDGE WOLFE: Yes.

3 BY MR. DOHERTY:

4 Q Turning to Page 30 then. I think on Page 31 I  
5 have a question under the "How could passive solar techniques  
6 save energy?"

7 Do you say from this quote or this statement,  
8 answer there has never been any passive solar system prior to  
9 1967?

10 A No. I am not saying that there has never been a  
11 passive solar system prior to 1967.

12 For one thing, the Indians before we showed  
13 up, and the frontier people used passive techniques because  
14 they had no other choices essentially. If they were going to  
15 stay warm in the winter they needed to be protected from north  
16 winds.

17 If they were going to be able to live in  
18 desert climates they needed to build into cliffs.

19 Q Well, is --

20 A However, the technical methods that I am describing  
21 in terms of the Skytherm, or in roofpond systems, night sky  
22 radiation systems, first was developed in this country at that  
23 time.

24 Q So there were no passive solar cooling systems in  
25 the United States prior to this time?

1 MR. BLACK: That has been asked and answered.

2 MR. DOHERTY: No. I think not.

3 I think, perhaps, I have made an omission,  
4 but the statement actually refers to cooling, and I think my  
5 question originally was more vague than that. I think I just  
6 said "passive solar systems." I don't recall my exact words,  
7 but I don't think I said "cooling."

8 MR. BLACK: But her response responded both to  
9 passive cooling and passive heating. I object. It has been  
10 asked and answered.

11 MR. DOHERTY: I don't believe she spoke of cooling.  
12 I was listening for her, hoping she would pick it up, and I  
13 don't think --

14 JUDGE WOLFE: No harm. You --

15 THE WITNESS: The methods that I discussed in terms  
16 of night sky radiation, the Skytherm system are exclusively  
17 cooling systems.

18 I did not address the type of heating systems,  
19 because they would tend to increase the load for HL&P, because  
20 there would be significant increase in heating to the hoses in  
21 the summertime, as well. They would not be able to prevent  
22 that, if they had passive solar heating systems. It would be  
23 difficult to prevent.

24 Therefore, I addressed myself exclusively to  
25 passive cooling techniques.

1 BY MR. DOHERTY:

2 Q All right. How large was this Skytherm structure?

3 A The Syktherm structure is a house. I am not sure  
4 the size of the house.

5 Q It is a house, though?

6 A (Nods head.)

7 Q It is not -- You spoke of it as a building, so  
8 I am wondering if --

9 A Well, I don't know that anyone is living in it.  
10 If people were living in it the experiment would be biased by  
11 the people's personal habits.

12 Q All right.

13 A The amount of lights they left on, and that sort  
14 of thing, that add heat to the building.

15

16 / / /

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25

1 BY MR. DOHERTY:

2 Q What is a thermopond?

3 A A thermopond is merely a system where you have the  
4 roof built up such that you can have a foot or two feet of  
5 water on top of it.

6 There is a layer of plastic inbetween, usually,  
7 and is metal in order that the heat or cooling between that pond  
8 and the building can be transferred.

9 Q I believe a little while ago you mentioned a project  
10 in Atascadero, California.

11 A Yes.

12 Q Was that one of these type of projects?

13 A I believe that the house in Atascadero does have a  
14 roof pond system. I believe it uses the floating foam system  
15 to control it.

16 And these --

17 Q Are you --

18 Go ahead.

19 A These systems usually have pumps to control whether  
20 the foam is open or closed, or whether water is flowing over  
21 the foam in order to radiate to the sky, and, therefore, they  
22 are not usually classified as passive techniques, although they  
23 substantially reduce the energy requirements.

24 Q Are you familiar with a solar powered cooling system  
25 installed in one of the Boston public schools?

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A. No. I am not familiar with that.

Q. Where does the power for the pump come from?

A. I assume it is an electric pump.

Q. All right. So it does not come from a solar system  
itself?

A. No. It does not.

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1 BY MR. DOHERTY:

2 Q Now your reference at the bottom of page 32,  
3 you state: "These simple passive cooling techniques should  
4 be economically feasible," and then you give a referen .

5 Is that the National Energy Plan that that's  
6 referencing?

7 A Yes.

8 Q Now I think a moment ago you spoke --

9 A No, wait a minute. I take that back.

10 Q All right.

11 A This is the Economics of Solar Energy and  
12 Conservation Systems, 1980, as is indicated on the  
13 references.

14 Q All right, thank you.

15 That's Reference 2 then?

16 A Yes.

17 Q Now in discussing cooling with Mr. Doggett,  
18 why would you not compare Phoenix and Houston?

19 A The Phoenix area is very dry. They have a  
20 situation where it's very, very warm during the daylight  
21 hours and becomes quite cool at night, such that they are  
22 able to ventilate the house at night and have that house  
23 remain cool for a substantial portion of the day with some  
24 of the ventilation techniques and with the roof pond  
25 systems.

1 In the Houston area there is little evapora-  
2 tion which does a lot of the cooling, just as evaporation  
3 on your skin cools you down. It works the same way for  
4 houses.

5 And, thus, the system is not as effective in  
6 the humid climate.

7 Q Would this also be true of structures larger  
8 than houses -- office buildings perhaps?

9 A Office buildings may or may not be able to  
10 use these kinds of techniques.

11 I would say that it would be very easy for a  
12 one-story building to cool itself using a roof pond  
13 system.

14 If you're talking about a skyscraper-type of  
15 building, there is unlikely to be enough space for the air  
16 to move to the top floor where the cooling occurs.

17 The necessary ingredient is that the warm air  
18 has to be transferred up to that roof through some means.

19 Q Do you know of any solar cooling system de-  
20 signed for buildings of more than ten floors at this  
21 time?

22 A I expect that using something like solar  
23 inductive ventilation, you could do them for tall buildings.  
24 However, you'd have to have some kind of a ventilation  
25 system added in, which isn't currently present in our

11-3

1 structure of office buildings.

2 So I don't know of a particular one in existence  
3 now.

4 Q All right.

5 Would such a system require ventilating fans  
6 to push air up? Is that --

7 A The solar inductive technique --

8 Q Yes --

9 A -- to the best of my understanding requires  
10 a thermal chimney which heats the air at the top, raising  
11 it.

12 That allows the air underneath it to move up.  
13 And as the warm air is rising, you're drawing through a  
14 breeze at least.

15 Q Is that a passive solar technique -- thermal  
16 inductive --

17 A Yes, that's a passive solar technique. There  
18 are no moving parts to it.

19 Q Now in order to have this system function,  
20 that would require a chimney, you called it?

21 A Yes.

22 Q I am visualizing a kind of -- like an elevator  
23 shaft going the height of the building from the first floor  
24 to the top?

25 A Something of that nature would probably work



11-4

1 fairly well.

2 The chimney itself does not -- In a one-story  
3 building the chimney only needs to be sticking up off of  
4 the top of the building.

5 It would need to have that elevator shaft-type  
6 of appearance, I would think, to be used in a multi-story  
7 building.

8 Q I see.

9 Do you know of any multi-story buildings in  
10 operation --

11 A No, I do not.

12 Q Would the same problem with humidity apply to  
13 30-story buildings, as is the same with --

14 A The problem with humidity is --

15 Q May I finish?

16 A -- just a function of roof ponds --

17 Q May I finish? I think you won't answer my  
18 question.

19 You have indicated in comparing Phoenix to  
20 Houston, that it is not sensible because of the humidity  
21 in the air.

22 Now is the humidity a factor at a height of,  
23 say, a 30-story building? Would that still be a factor  
24 that would mitigate against this type of system ... in  
25 Houston as opposed to, say, Phoenix?

11-5

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1           A        I assume that it is as humid at the top of a  
2 30-story building as it is at the top of a 10- or one-  
3 story building; but I'm really not sure whether humidity  
4 changes with height.

5           Q        Yes. We won't push the details. That's all  
6 right.

7                    Do you know of any -- Moving on to page 33 --  
8 Some of these questions will be kind of tangential.

9                    Do you know of any tax breaks that are involved  
10 with any solar installations today?

11           A        Not in passive solar installations.

12                    The Government has not yet allowed tax credits  
13 to go for either passive solar or -- I'm not sure about  
14 wood stoves --

15                    But they do allow them for active solar.

16           Q        They allow them for what?

17           A        Active solar systems are allowed tax breaks  
18 for individual home owners ... to buy them or increase  
19 their levels.

20                    That does not currently exist for passive  
21 solar partially because of the problem in defining.

22           Q        I see.

23                    Now do you know of any tax breaks available  
24 to manufacturing businesses or small businesses, or any  
25 of the commercial sector?

11-6

1           A        I do not believe there are any manufacturing  
2 tax breaks.  There are none that I am aware of.

3           Q        Going down to the second paragraph in your  
4 answer there on page 33, you state:  "On a smaller scale  
5 level, ignorance of available technologies is largely  
6 responsible for low adoption rates" of passive solar  
7 techniques.

8                    I think you said -- would you correct me if  
9 I'm wrong -- that that came from an article in "Business  
10 Horizons" magazine?

11          A        Yes, I did.

12          Q        All right.

13                    Is that a journal of academic economists --  
14 "Business Horizons"?

15          A        That is a journal of the Department of Business  
16 Administration and Economics for the University of  
17 Indiana, I think.

18          Q        All right.

19                    Now you spoke about solar advocates.  Would  
20 you consider a major energy firm, such as Gulf Oil or  
21 Exxon, a solar advocate?

22          A        I don't think that Gulf Oil considers it in  
23 their best interest to advocate the use of passive solar  
24 techniques.

25                    I may be mistaken.

11-7

1 Q Now if they did, would you then say that  
2 they're likely to have less capital access than is neces-  
3 sary to reach consumers about the advantages of the  
4 system?

5 A No. I am saying that the people that are  
6 currently advocating the use of passive solar power are  
7 likely to be these individuals and groups that have not the  
8 access.

9 I'm not saying that solar advocates, by virtue  
10 of being solar advocates, do not have access to capital  
11 markets.

12 Q All right.

13 Then you went on into local building codes  
14 and their effect on passive techniques.

15 Do you know a building code that discourages  
16 the use of passive techniques?

17 MR. NEWMAN: Asked and answered, Mr. Chairman,  
18 in response to one of Mr. Doggett's questions, I believe.

19 MR. DOHERTY: I believe Mr. Doggett asked for  
20 the City of Houston alone, and I wanted to pursue it  
21 nationwide or ...

22 (Bench conference.)

23 JUDGE WOLFE: Sustained.

24 MR. DOHERTY: Okay.

25 ///

1 BY MR. DOHERTY:

2 Q Do you know of a mortgage company that hesi-  
3 tates to subsidize construction of unusual buildings?

4 A Specifically? I would say that mortgage com-  
5 panies in general have an interest in preserving the value of  
6 the houses on which they write mortgages, since they are  
7 their property.

8 Q All right.

9 You said "preserving the value." But this would  
10 be new construction.

11 A Yes. But if an individual who holds a mort-  
12 gage is unable to sell that property at the rate for which  
13 the mortgage is written, then the mortgage company incurs  
14 costs of trying to get back their money and perhaps a  
15 failure in that attempt, which is why your home is in-  
16 spected before you're able to get a mortgage.

17 Q Can you name a utility that is required to  
18 send out information on conservation?

19 MR. NEWMAN: Mr. Chairman, I would object to  
20 that question. I don't believe that's really relevant  
21 to any point that's in the witness' testimony.

22 MR. DOHERTY: She states: "The role of  
23 utilities may also be important."

24 Mr. Doggett, I believe, spoke up about public  
25 information or public awareness on conservation. I

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believe in the ensuing discussion there was some statement about whether utilities were required or not -- and some uncertainty.

I'm trying to find out if she knows of any utility that's required to send out such information.

I believe --

MR. NEWMAN: Okay. I'll withdraw the objection. It's not worth the pain.

JUDGE WOLFE: All right.

Answer the question.

- - -

11-10

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1 THE WITNESS: I believe that this requirement  
2 exists. I'm not certain that it exists.

3 They are not, however, given any specific  
4 technologies that they're supposing to be advocating.  
5 Mostly they come out in favor of reducing your thermostat  
6 and lowering the level on your water heater.

7 The size of the pamphlet that can fit into  
8 your bill does not leave very much room for explaining  
9 new technologies.

10 BY MR. DOHERTY:

11 Q Yes, I've noticed.

12 Do you know of a utility that ever proposed  
13 offering a lowering rate to all electric users?

14 A Many utilities have that. I think that Boston  
15 Electric is the specific utility which is exemplified in  
16 that statement, which give all electric users lower  
17 rates as part of an incentive to increase use of electri-  
18 city during the days when it was felt it was becoming  
19 increasingly inexpensive to use. Those rates became  
20 popular.

21 This particular utility ruled that a passive  
22 solar banking building utilized another heat source es-  
23 sentially. They seemed to think that the passive solar  
24 was another fuel, and therefore, they did not qualify for  
25 an all electric rate.

-11

1 Q Do you know of any such action against resi-  
2 dential consumers?

3 A I would assume that that particular utility  
4 would have the same objection to a residential user. How-  
5 ever, I cannot say that with certainty.

6 Q Moving on to page 34 --

7 MR. DOHERTY: Your Honor, I wouldn't be adverse  
8 to a break right now. I'm not quite finished, but people  
9 are tired. And it's about time ... the usual time.

10 MR. NEWMAN: How close are we to the end of the  
11 examination, Mr. Doherty?

12 MR. DOHERTY: I think in the end I'd like a  
13 couple of minutes to look over ... you know, just to  
14 check before I finish up. I could do that during the  
15 break so --

16 MR. NEWMAN: Why don't we just stop for a few  
17 minutes while you check your notes and then finish up with  
18 the witness and get her off the stand, after the Board  
19 questions?

20 MR. DOHERTY: The Board may have a preference  
21 different to that.

22 JUDGE WOLFE: Pardon me?

23 MR. DOHERTY: Nothing, sir ... just --

24 JUDGE WOLFE: I'm sorry. I didn't hear what  
25 you said, Mr. Doherty.



-12

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1 MR. DOHERTY: I said -- I was speaking back  
2 to Mr. -- to Applicant's counsel that the Board might  
3 have a different preference.

4 JUDGE WOLFE: It does.

5 We'll have a 15-minute recess.

6 (A short recess was taken.)

7 JUDGE WOLFE: All right, Mr. Doherty.

8 MR. DOHERTY: All right. We're almost  
9 finished.

10 MR. DOGGETT: Let me interrupt for just a  
11 second.

12 Mr. Chairman, I have a procedural question  
13 that I think it would be wise to resolve at this point.

14 It is my intention to attempt to cross-  
15 examine -- is it Dr. Dick or Mr. Dick? Mr. Dick.

16 And it's my understanding that under the old  
17 rule, I have to show good cause for proceeding out of  
18 alphabetical order.

19 The reason I bring this up now is I would like  
20 to try to make my case for good cause, and if the Court  
21 denies me the right to cross-examine, I will have an  
22 opportunity to make alternative arrangements with another  
23 Intervenor to ask my questions.

24 JUDGE WOLFE: All right.

25 MR. DOGGETT: On the issue of good cause, as I

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have reviewed the transcript and reviewed my notes, and as I recall, Mr. Dick came on to testify the afternoon of February 13.

He was cross-examined by Mr. Doherty, and Mr. Scott began his cross-examination.

The reason I was not here was -- there are two basic reasons. Number one, from my conversations with Intervenors, I did not think Dick would be called as a witness on the day that he was called.

And, secondly, on that day I was required to be in court -- in the County Court at Law in Fort Ben County in a juvenile trial.

Those are my reasons for asking that the Court find that I have good cause for not being present at the beginning of the cross-examination.

Further, in support of my request to be allowed to cross, I would like to advise the Board that I have reviewed all of the transcript for Mr. Dick's testimony; and I can assure the Court that I will not ask any repetitious questions, or go into any subjects that have already been covered.

MR. COPELAND: Mr. Chairman, I would just respond to that by noting two things; that the order of presentation of the witnesses was done at the request of the Intervenors, as I recall, so that if Mr. Doggett was

11-14

1 prejudiced in any regard by establishment of that order,  
2 it certainly wasn't the Staff's or the Applicant's  
3 fault.

4 I don't think that that ought to be weighed  
5 against us.

6 Secondly --

7 JUDGE WOLFE: I don't know what you mean by  
8 "the order was established."

9 All that I recall is that we were proceeding  
10 alphabetically, and then Mr. Schuessler came before Mr.  
11 Scott; and there was a decision -- an agreement between  
12 them that Mr. Scott would precede Mr. Schuessler.

13 I'm unaware of what you're speaking to, that  
14 there was an agreement between intervenors as to cross-  
15 examination.

16 MR. COPELAND: Well, they were the only two  
17 that were here when Mr. Dick came on; and that was the  
18 order that they presented that they wanted to go in.

19 JUDGE WOLFE: All right.

20 MR. COPELAND: Secondly, with respect to  
21 conflicting court sessions, every lawyer has that  
22 problem. And, you know, it seems to me that this is a  
23 prior court setting, and that Mr. Doggett (as any lawyer  
24 would do) should have moved the judge in the other proceed-  
25 ing to postpone that proceeding until he had finished his

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work that was ongoing in this case. It would be just as though he were in trial in another case.

In any situation like that, a lawyer should always move for postponement of the proceeding that's following, rather than the one that he's involved in that's ongoing.

JUDGE WOLFE: Anything else?

MR. BLACK: The Staff comments as to the showing of good cause are twofold. Number one, I don't believe good cause is shown based upon the scheduling problems that he had with regard to the representations made by other Intervenors. That clearly to the Staff is not good cause.

With respect to conflicts with other legal proceedings, in the ordinary sense I would agree with Mr. Copeland that counsel should make schedules accordingly. And this proceeding has been scheduled for sometime.

But I must note also that the purpose of the Board's ruling with respect to the sequence of cross-examination was largely to avoid repetitive cross-examination.

And Mr. Doggett certainly has indicated that he would avoid repetitious cross-examination by his review of the transcript.

So I think that that works in his favor.

11-16

1 And so in the end result, I think -- And  
2 also, Mr. Doggett has indicated that he would tender his  
3 questions to another Intervenor who he claims has re-  
4 served his right of cross-examination; namely, Mr.  
5 Schuessler.

6 For some reason I don't remember that reserva-  
7 tion of right. But maybe my recollection is faulty at  
8 this point.

9 But if that is the case, we probably would be  
10 better served by having Mr. Doggett do the examination,  
11 since they would be his questions.

12 And weighing all of these factors together,  
13 I think that if the examination is reasonable, if it's  
14 not repetitious, the Staff would have no objections to its  
15 proceeding, and noting very clearly though that we do not  
16 think that -- at least one of the factors indicated by Mr.  
17 Doggett represents good cause.

18 And another thing that I indicated to Mr.  
19 Doggett that ... also, if he runs into this problem with  
20 respect to court appearances, that he should inform the  
21 Board and the parties prior to it happening that there is  
22 a conflict -- an unavoidable conflict, so that ... you  
23 know, something can be worked out.

24 MR. DOGGETT: May I have just a very brief  
25 response?

11-17

1 JUDGE WOLFE: All right.

2 MR. DOGGETT: The only reason I didn't make --  
3 notify in advance was because I didn't realize the witness  
4 would be called.

5 The only way to solve that prior notification  
6 problem would be for me on a weekly basis to submit a  
7 copy of my schedule, because I have no way of knowing what  
8 witnesses will be here or won't be here.

9 But I don't want to belabor that.

10 JUDGE WOLFE: At least you weren't given such  
11 good advice by someone ... someone telling you that Mr.  
12 Dick wouldn't be reached, when, in fact, he was reached  
13 at 1:45 in the afternoon on Friday, February 13th. Wouldn't  
14 you agree?

15 MR. DOGGETT: Well, I think they gave me their  
16 best guess at the time. I don't think anyone was trying  
17 to deliberately mislead me in any way.

18 JUDGE WOLFE: I didn't suggest that. I was  
19 just saying that you didn't get the very best advice.

20 MR. DOGGETT: Yes, I would agree with  
21 that.

22 JUDGE WOLFE: All right.

23 Anything else?

24 (No response.)

25 (Bench conference.)

1 JUDGE WOLFE: The Board has conferred. We think  
2 that you have not made a good showing of good cause. Other  
3 litigation notwithstanding, this litigation, this case, this  
4 trial, has been in the works for some time, and the county  
5 court should have been so advised previously of the conflict.

6 Further, as I noted, we sympathize with you.  
7 You should have received better advice from the people who were  
8 advising you as to the rundown and the progress of this case.

9 So, if you wish, you may hand your questions  
10 to some other Intervenor to be asked on your behalf, or just  
11 asked period. All right?

12 MR. DOGGETT: Yes, sir.

13 JUDGE WOLFE: Now, we are back to -- Mr. Doherty  
14 has completed his cross.

15 MR. DOHERTY: Today? No, I haven't quite.

16 JUDGE WOLFE: You have completed your cross-  
17 examination with this witness?

18 MR. DOHERTY: No, sir. I have not.

19 JUDGE WOLFE: All right. We will go back, and we  
20 will resume that.

21 MR. DOHERTY: All right. Thank you.

22 JUDGE WOLFE: All right.

23 BY MR. DOHERTY:

24 Q Turning to Page 34, the Final Supplement to the  
25 Final Environmental Statement. I need to open up to that page

1 a minute.

2 It states here: "...the applicant would  
3 still need generating capacity to meet load demands when these  
4 systems switched to their backup supplies of electricity  
5 during a period of several cloudy days,..."

6 Now, it has been shown earlier that the peak  
7 demands on the HL&P system are in the summer. And that actually  
8 the cloudy days are the cooler ones, because of the sub-tropical  
9 environment here.

10 With that in mind, does that statement make  
11 sense to you?

12 A All right. The Staff's original assessment was  
13 based on passive solar use for heating.

14 I have not dealt with passive solar for  
15 hearing in my testimony, for reasons that I have already given.

16 But the same argument as used for passive  
17 solar cooling in that the hottest days of the summer are going  
18 to still require people to switch to their backup sources,  
19 which are likely to be electricity for air conditioning, and  
20 probably bringing you to a needle peak-type of a system, where  
21 the peak is just as high, but it occurs for a shorter amount  
22 of time, which means that you still have the same kinds of  
23 capacity requirement. You still have to be able to meet that  
24 hottest day of the summer peak.

25 Q Is your testimony then that the hottest day of the



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1 summer will not -- will be a cloudy day?

2 A. No. No.

3 My testimony is that the original Staff  
4 assessment was based on passive solar heating, whose backup  
5 requirements are necessary during cloudy days, if you are  
6 trying to heat with the sun you are getting that problem.

7 Additionally, cloudy days will interfere  
8 with passive solar cooling, although that is not very much of  
9 an issue in this instance, since those cloudy days are cooler  
10 if you are using that heat inductive chimney.

11 Q All right. Thank you.

12 Now, you quoted the Section .8.2.6 of the  
13 Final Supplement. Is the only way in which you believe that  
14 possible regulations may require increased electrical demand  
15 related to transportation?

16 A. No. It is merely a matter of those sources, in  
17 terms of oil, it is simply a matter of those kind of units  
18 requiring oil may also include machinery of different types  
19 other than in transportation.

20 I am not aware of specific machineries or  
21 industrial processes that require oil. However, I expect that  
22 there are many such items, especially those that would use the  
23 kind of engine that is used in automobiles as a part of their  
24 power source.

25 MR. DOHERTY: Okay. Ms. Johnson, I appreciate your

12-4  
1 efforts in informing myself this afternoon of the virtues of  
2 passive solar and solid waste combustion, and I look forward  
3 to its use.

4 Thank you very much.

5 Pass the witness, Your Honor.

6 JUDGE WOLFE: Is there redirect, Mr. Black?

7 MR. BLACK: Yes, Your Honor.

8 DR. MARRACK: Your Honor, can I cross-examine the  
9 witness, please?

10 JUDGE WOLFE: You arrived at 2:25 this afternoon,  
11 doctor. You know our ruling.

12 DR. MARRACK: Sir, may I --

13 JUDGE WOLFE: Redirect, Mr. Black.

14 DR. MARRACK: Sir, can I make an observation,  
15 please, sir?

16 JUDGE WOLFE: No.

17 DR. MARRACK: May I have a bill of exceptions, then,  
18 please, sir?

19 JUDGE WOLFE: You may take exception, yes.

20 DR. MARRACK: I humbly --

21 JUDGE WOLFE: No. I said I am not having any  
22 argument. You know our ruling, doctor, and I am not going to  
23 hear any more argument on it.

24 Redirect, Mr. Black.

25 MR. SCHUESSLER: Mr. Chairman, may I enter into the

12-5-

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1 record that I am present and would like to cross, also, sir?

2 JUDGE WOLFE: Mr. Schuessler, to my notes Mr. Doggett  
3 began cross-examination at 10:56 this morning, and you appeared  
4 at 11:47 a.m., which was after cross-examination began.

5 Again, our ruling precludes your cross-  
6 examination.

7 All right. Mr. Black, redirect.

8 REDIRECT EXAMINATION

9 BY MR. BLACK:

10 Q Are passive solar heating and cooling techniques  
11 effective in the economic sense of reducing electrical demand  
12 in saving energy?

13 A Yes. They may be.

14 Q Have you done an assessment of how much reduction  
15 in demand could be achieved in HL&P's service area by the use  
16 of these techniques?

17 A No. I have not.

18 Q Has reduction of demand by conservation techniques  
19 and possibly solar cooling techniques been reflected in the  
20 Applicant's demand forecast?

21 A Yes. It has.

22 Q How is that reflected?

23 A Through the use of a price variable in their  
24 econometric equations, they derive a price elasticity.

25 Q What does a price elasticity factor reflect?

12-6

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1 A The long-term price elasticity reflects the adjust-  
2 ments in terms of quantities of electricity demanded, and the  
3 response to increases in price.

4 Q Does this mean that as the price of electricity  
5 increases it becomes more economic to incorporate conservation  
6 techniques and residential commercial industrial buildings?

7 A Yes. It does.

8 Q So is it your opinion and testimony that the  
9 Applicant has reflected the possible reduction in electrical  
10 demands to conservation techniques, i.e., passive cooling and  
11 heating techniques, by its reduction in this demand forecast  
12 through the use of a price elasticity factor in its economic  
13 viables?

14 A Yes, in my opinion.

15 MR. BLACK: No further questions.

16 JUDGE WOLFE: Let the record reflect that  
17 Dr. Marrack left about a minute ago at 4:21 p.m.

18 All right. We will now have Board questions.

19 BOARD EXAMINATION

20 BY JUDGE LINENBERGER:

21 Q Your discussion of combustion of solid waste as an  
22 alternative energy source, I believe is directed toward a  
23 specific contention, which contention begins by stating, or  
24 alledging, that neither the Applicant nor the Staff have given  
25 adequate consideration to the combustion of solid waste as an

1 alternate energy source because -- and I stop quoting there,  
2 because what follows can be generally considered as bases to  
3 the contention.

4 Now, I should like to ask you: You are  
5 appearing as a Staff witness. Is the thrust of your contention  
6 on solid waste combustion directed toward augmenting and  
7 supplementing what the Staff has considered on this subject,  
8 or is the thrust of your contention to demonstrate that the  
9 Staff, indeed, has given adequate consideration to the subject?

10 (Pause.)

11 A. I believe that the Staff has given adequate  
12 information, and adequate consideration to the topic of burning  
13 solid waste.

14 I have also provided additional information.

15 Q. All right. Thank you.

16 Beginning at the bottom of Page 20 and the  
17 top of Page 21 I interpret that sentence to say that the amount  
18 of material necessary to generate a particular amount of steam  
19 cannot be determined, or is indeterminant, as you say, and yet  
20 whereas you weren't calculating an amount of steam at least on  
21 Page 27 you were calculating amounts of energy.

22 Now, is there -- are the two parts of the  
23 testimony consistent in that respect?

24 A. In the types of plants that I am talking about,  
25 the method of generating electricity is to generate steam which

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drives the turbine. Thus, they are consistent.

Q I beg your pardon. I didn't hear your last statement.

A They --

Q So they are consistent?

A The statements are consistent.

Q You say you can calculate how much --

A Oh, no.

Q -- material would be required to generate a certain amount of electricity, but you cannot calculate how much material will be required to generate a certain amount of steam?

A Based on knowledge of the constituents of solid waste, which I list for a national average on Page 22, you can determine the number of Btu's per pound for that given composition of waste.

And using that composition of waste you can figure out how much energy can be derived.

However, the composition is site specific. Some parts of the country probably have different kinds of waste that predominate.

It would also depend on whether there is an active system for newspaper recycling, for example.

Q With respect to Table 3 on Page 22, doctor, you indicated through footnote citations the sources of several

12-9  
1 heat content values, but the largest one for plastics I don't  
2 see a citation for. Can you say from whence you derived that?

3 A. The source of the materials in that table is the  
4 National Research Council citation, which is listed at the  
5 bottom. These figures came from Pages 22 and 25.

6 The listings above are -- show you that the  
7 composition of the original waste from which I guesstimated an  
8 amount of Btu's per pound in order to make these two sources  
9 on Pages 22 and 25 coincide. The author there divided his  
10 two tables in a different manner, so that when he is listing  
11 the constituents of waste he listed them and in the percentages  
12 given in the table, and when he later listed the number of  
13 Btu's per pound for different components of the waste, he did not  
14 categorize them in the same manner.

15 Q I see.

16 A. So those are the manner of averaging it out.

17 Q Fine. Thank you.

18 At the top of Page 23, the first answer  
19 appearing on the page makes a reference to "over zealous  
20 adoption of technology."

21 What does that refer to?

22 A. I am referring to plants such as the Baltimore  
23 pyrolysis plant, which one of my sources lists as the world's  
24 first pyrolysis plant which has had a number of well-publicized  
25 problems, and has been shut down at least once for a long period

1 of time. Although, I believe it is now operating again.

2 I am just saying that it may be a tendency  
3 of some persons to put up an interesting kind of plant before  
4 it has been fully tested.

5 Q You indicated earlier that you were at least  
6 familiar with the testimony of Woodson on this subject, I  
7 believe. Is that correct? Have you reviewed Dr. Woodson's  
8 testimony?

9 A I have seen Dr. Woodson's testimony, yes.

10 Q Are you in a position to advise us whether you have  
11 found any significant differences between your results and  
12 his?

13 A There are some differences in our results. The  
14 major difference is in the quantity of waste available.

15 Q And do you have any comment on --

16 A There are two things. He assumed that there are  
17 three and a half pounds of waste per person.

18 My figures from the EPA list seven pounds per  
19 person.

20 Charles Howe in his book on Natural Resource  
21 Economics also derives a figure of seven pounds per person from  
22 municipal sources. I suspect that Dr. Woodson was talking about  
23 household sources and not municipal sources, and that may have  
24 made a difference.

25 The other possibility -- He then corroborates



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that evidence with the quantity of waste collected I guess by Browning Ferris, I'm not sure, which is listed for the City of Houston, and he is using that to corroborate his figure for the metropolitan area of Houston.

I'm not sure that those would be the same. Therefore, I would go along with my figures of approximately 6000 tons per day at seven pounds per person, and 1.7 million people. That comes out to 5950 pounds per day.

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1 BY JUDGE LINENBERGER:

2 Q On Pge 28 your last word on the subject of solid  
3 waste is "yes," which is in answer to a question about whether  
4 the Staff still concludes that the combustion of solid waste  
5 is not a viable alternative to the proposed Allens Creek plant.

6 And your "yes" indicates the Staff still does  
7 so conclude.

8 Just interested here, to what extent you have  
9 reviewed the material in your paper with other members of the  
10 Staff in order to determine for yourself that the Staff has  
11 not altered its position?

12 A It is my belief that I am the representative of the  
13 NRC Staff for the contention, and that's --

14 Q I'm sorry.

15 A -- my review of this is --

16 Q I didn't understand what you said. I just didn't  
17 hear your words.

18 A It is my belief that I am considered the representative  
19 for the NRC Staff on this issue at this time. That I have not  
20 corroborated this with other members of the Staff whose  
21 responsibilities were to research other issues.

22 Q Well, has your paper been subjected to any sort of  
23 peer review, either up amongst your associates on the Staff, or  
24 with --

25 A Yes. My paper has been reviewed at Oak Ridge

1 National Lab. Anything that comes out of the laboratory has  
2 to go through a review process.

3 Additionally, I believe that Mr. Black has  
4 shown this to Dr. Perl in an effort to ascertain that the  
5 work was correct, to the best of his knowledge.

6 Q Let's move now briefly to the passive solar topic.

7 Again, I should like to read the contention  
8 to which your testimony is addressed. "There has not been a  
9 dispositive assessment of the energy demand reduction potential  
10 that might derive from conservation measures available to  
11 Applicant, because neither Applicant nor Staff has considered  
12 the increased use of passive solar techniques."

13 Again, I must ask you the same question, kind  
14 of question here as I did previously. Is the thrust of your  
15 testimony that of supplementing the Staff's consideration of  
16 passive solar techniques so as to make it perhaps more nearly  
17 acceptable, or is the thrust of your testimony to somehow  
18 demonstrate that the consideration that the Staff has already  
19 given to passive solar techniques is adequate?

20 A I believe that the consideration given by the Staff  
21 and Applicant to the passive solar techniques is adequate as it  
22 is reflected in the redirect that we have just finished. The  
23 information I provided does augment the original discussion on  
24 passive solar, since the Staff didn't specifically spend time  
25 in talking about different techniques as they did on some of the

1 other alternatives.

2 Q The first few pages of your testimony, let's say  
3 up through Page 33, seem primarily to be devoted to a  
4 description of various ways that passive solar techniques might  
5 be employed, and on Page 33 a characterization of some of the  
6 pros and cons of passive solar techniques.

7 By and large, would you say that these first  
8 three pages of -- four pages, 30 through 33 of your testimony  
9 represent original effort on your part or a summarizing of  
10 things that you have obtained from other sources?

11 A I believe that they mostly represent a summarization  
12 of knowledge gained from other sources.

13 Q There is a question at the top of page -- near the  
14 top of Page 34 that is followed by a relatively long two-  
15 paragraphs answer. Both paragraphs make references to the  
16 supplement of the Final Environmental Statement.

17 Do those paragraphs mainly contain information  
18 that appears in the supplement and is being repeated here in  
19 perhaps a slightly different context, or are there inputs in  
20 these two paragraphs that you have gleaned from literature not  
21 contained in the supplement?

22 A The only statement in those two paragraphs which  
23 was not gleaned from the supplement is the last sentence on  
24 Page 34, the "Finally, even if conservation of energy measures  
25 are effective.."

12-15

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1 Q Okay.

2 Now you say that did not come from the  
3 Supplement?

4 A No. That is my statement. All of the other  
5 statements are from the Supplement.

6 Q And does that statement represent what I  
7 would call an independent conclusion on your part then?

8 A Yes.

9 Q Is it the result of synthesizing what you've  
10 read and heard and talked about, or is it, in essence, your  
11 statement of a conclusion that others have made?

12 A The final statement is in support of Mr.  
13 Dick's testimony concerning the natural gas contention.

14 Q Well, I believe that. But I guess I don't  
15 quite see that you've answered my question.

16 That final statement on page 34 contains a  
17 conclusion that you might have arrived at on your own  
18 literature reviews, discussions with other people, whatever  
19 readings you've done -- or that might have been a con-  
20 clusion that you've adopted from somebody else.

21 Now did you answer that question or not? I  
22 didn't think I heard the answer.

23 A I stated that it was in reliance on the accuracy  
24 of Mr. Dick's testimony.

25 Therefore, I guess that would be a conclusion

12-16

1 adopted from someone else.

2 Q All right, fine.

3 Now again, as before, the final question was:  
4 Has the staff's conclusion set forth in the Final  
5 Supplement changed?

6 And your answer was: No

7 Again, I ask: Do you answer no here because  
8 you have reviewed your material with other people in the  
9 staff and determined that nothing has changed?

10 Or are you really as part of this panel  
11 speaking for the staff on the position of the staff?

12 A We haven't spoken on this subject, but I think  
13 that my opinion is the staff opinion at this point.

14 Q Fine. Thank you.

15 JUDGE LINENBERGER: I believe that's all the  
16 questions I have.

17 However, Mr. Chairman, one question for  
18 Applicant's counsel.

19 Both of the two contentions, Mr. Newman, that  
20 each of the two contentions that Dr. Johnson's testimony  
21 has addressed has alleged not only inadequacies with  
22 respect to what the staff has done, but also with respect  
23 to what the Applicant has done.

24 Dr. Newman is here to correct that situation  
25 for staff. Is -- Can you tell me, is Applicant

12-17

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1 presenting anything direct on this at sometime? Is it  
2 your intent? Or has it already been or --

3 MR. COPELAND: Judge Linenberger, let me  
4 answer that question.

5 JUDGE LINENBERGER: Sure.

6 MR. COPELAND: We believe we have addressed  
7 those issues through Dr. Anderson and Dr. Perl.

8 You'll recall -- and I believe this again  
9 relates to the redirect testimony that Mr. Black just  
10 presented; and that is, that it's our position that con-  
11 servation is accounted for in our load forecasting  
12 through price elasticity.

13 And you'll recall that Dr. Anderson testified  
14 that he believes that his range of forecasts takes into  
15 account all economic conservation measures that would  
16 be pursued by consumers.

17 And Dr. Perl further took the assumption that  
18 he would artificially constrain load growth down to  
19 zero to account for any form of conservation measures  
20 whatsoever, whether they were done because of economic  
21 actions by the consumer or mandated by some form of Govern-  
22 ment action.

23 So he went to the furthest extreme of  
24 assuming that any and all conceivable types of conserva-  
25 tion may have been accounted for; and you still need the

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plant.

JUDGE LINENBERGER: So the simple answer here is that the Applicant rests its case on this -- so far as this issue is concerned?

MR. COPELAND: Yes, sir.

JUDGE LINENBERGER: That's really all I needed to know.

JUDGE WOLFE: Judge Cheatum.

JUDGE CHEATUM: I have one.

- - -



BY JUDGE CHEATUM:

1 Q Ms. Johnson, the second sentence of the  
2 second paragraph of that page, you comment about the  
3 inability of the United States to change people's habits  
4 to a significant degree.

5 Can you think of any economic circumstances  
6 a general federal policy, or even state policy for that  
7 matter; but, especially, economic which might profoundly  
8 change people's habits with respect to conservation of  
9 energy and finding of substitutions, such as the use of  
10 solar power more than it is. And burning of garbage, more  
11 than it is.

12 I would just like to hear your opinion on that.

13 You have quite a number of opinions in your  
14 testimony here.

15 You are quite an opinionated lady, I believe.

16 A Public policy could change, say, the amount  
17 of solar energy that is currently being used through such  
18 programs as the Davis, California program, which does  
19 not allow a house to be sold unless it meets certain  
20 conservation and solar guidelines.

21 There is talk in the economic literature  
22 about taxing wastes in order to reduce the amount of  
23 packaging materials, and that sort of thing.

24 I'm not sure what exactly what you could do  
25 to mandate the use of solid waste for energy, other than

13-2

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1 to simply mandate it.

2 Q But you said that was very unsuccessful.

3 A No. I said trying to mandate source  
4 separation of trash has been unsuccessful.

5 Probably because there is a lack of  
6 means of enforcement.

7 Q You don't think economics would be a major  
8 inducement, or --

9 A Oh. It could be.

10 There is a problem now in that the cost of  
11 trash collection and disposal is not at all based on the  
12 quantity that a particular individual throws out.

13 They are likely to pay the same amount.

14 You could, likewise, work on payment schemes,  
15 such as the bottle deposit method, that compensates the  
16 individual; but more for their time, which may cause more  
17 people to separate out their bottles.

18 And, that sort of a system probably most  
19 people will do a lot of different things if you pay them  
20 enough.

21 JUDGE CHEATUM: Thank you.

22 No more questions.

23 JUDGE WOLFE: Mr. Newman, cross on Board  
24 questions?

25 MR. NEWMAN: Just a few questions, Mr.

13-3

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1 Chairman.

2 RECROSS-EXAMINATION

3 BY MR. NEWMAN:

4 Q In answer to one of Judge Linenberger's  
5 questions, you indicated that you added some things to the  
6 Staff's analysis, particularly, with respect to the  
7 viability of solid combustion as a source of energy.

8 Is one of the things that you have added  
9 an assumption that in order for solid combustion to be  
10 successful, that the city or municipality involved would  
11 have to pay some amount or some subsidy for the removal  
12 and disposal of this waste material?

13 A The Staff did not consider that problem --

14 Q Is that one that you added?

15 A Yes.

16 Q And the other question that I have, relates  
17 to what you indicated with some disparity between yours  
18 and Dr. Woodson's testimony.

19 Dr. Woodson's testimony, which I think you  
20 said you read, postulates the availability of a certain  
21 amount of trash per individual in the City of Houston.

22 Is that correct?

23 A Yes.

24 Q Are your data directly pertinent to the  
25 City of Houston?

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Are they derived from Houston data?

A. No. Mine are derived from national data as is his.

Q And, you would have no knowledge, then, whether you national data were applicable to the City of Houston without checking first with Houston data, would you?

A. No. There would be no way of specific knowledge.

Q Okay.

JUDGE WOLFE: Have you --

MR. NEWMAN: Oh. Excuse me, Mr. Chairman. Yes, I've completed.

JUDGE WOLFE: Mr. Doggett?

MR. DOGGETT: I have no cross on the Board questions.

JUDGE WOLFE: Mr. Doherty?

BY MR. DOHERTY:

Q Judge Linenberger asked about peer reviews, and, I believe you said, that Dr. Perle has reviewed this before it was sent out before it was sent out as your testimony.

Is that right?

A. I believe, this is after it was sent out as my testimony.

13-5

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1 Q Okay.

2 Well, did he approve of it?

3 A As far as I know.

4 Q I see.

5 MR. DOGGETT: No further questions.

6 Thank you.

7 JUDGE WOLFE: Mr. Black, redirect?

8 MR. BLACK: Yes.

9 REDIRECT EXAMINATION

10 BY MR. BLACK:

11 Q I believe there is something confusing left to  
12 some responses that you just gave.

13 This is in response to Mr. Newman's questions  
14 about where Dr. Woodson derived his data on per capita  
15 consumption or manufacture of trash in Houston.

16 You indicate at one point that his data was  
17 derived from Houston, and another response you indicated  
18 that his was based on national data.

19 So, I would like to find out what Dr.  
20 Woodson's -- what data did he use to get at this trash  
21 figures?

22 A Dr. Woodson's data on the waste available in  
23 the metropolitan area of Houston are derived from the  
24 United States data.

25 He lists a paper -- a seminar on Municipal

13-6

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1 Solid Waste sponsored by the Electric Power Research  
2 Institute, was held in Ft. Lauderdale, which gives a  
3 number of tons and he assumes a population of 220 million  
4 people in the United States, and comes out with a figure  
5 of 3.2 pounds per capita, based on those United States  
6 figures.

7 He later verifies that amount using the  
8 proposal to the City of Houston by Gulf Coast Waste  
9 Disposal Authority, which reflects the quantity collected  
10 by the City of Houston, and not the metropolitan area of  
11 Houston, which may cause a difference there.

12 Q So, is your response that he initially uses  
13 national data, but later verifies it to cite specific or  
14 Houston data?

15 A Yes. He attempts to verify it.

16 MR. BLACK: Thank you.

17 No further questions.

18 JUDGE WOLFE: You wish to have the witness  
19 excused permanently?

20 MR. BLACK: Yes, Your Honor.

21 The witness is excused permanently.

22 (Bench Conference)

23 JUDGE WOLFE: All right, Mr. Black, we might  
24 as well proceed with Mr. Dick, at least for sometime,  
25 better get in as much as possible. Mr. Schuessler is here.

13-7

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1 and would like to cross-examine.

2 Is that correct, Mr. Schuessler?

3 Approximately, do you have any idea how long  
4 you'd be?

5 MR. SCHUESSLER: Well, considering the time  
6 and the circumstances, I really would like to have a chance  
7 to get familiar with some of these questions.

8 I would like to avoid being any repetition  
9 between Mr. Doggett's questions and my own.

10 As I say, the circumstances and the time  
11 strongly suggest that we might be given a little time to  
12 prepare to do this properly.

13 MR. DOHERTY: Your Honor, I would like to be  
14 excused from the proceedings at this point.

15 I have to rights to Mr. Dick.

16 I have already cross-examined him and I'd  
17 like to depart.

18 Is that --

19 JUDGE WOLFE: You've already cross-examined  
20 Mr. Dick and what else did you say, I didn't hear you?

21 MR. DOHERTY: I just would like to, I'm going  
22 to excuse myself --

23 JUDGE WOLFE: Yes. Yes. And, thank you.

24 MR. DOHERTY: Thank you.

25 MR. COPELAND: Mr. Chairman, I think we ought

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1 to keep going.

2 Mr. Schuessler obviously had his own  
3 questions that he came her prepared to ask, and I think  
4 he ought to proceed on those.

5 I think that what we have is a request for  
6 a continuance because of the ruling with respect to Mr.  
7 Doggett.

8 That seemed to me to be coming a full 360  
9 degrees, that we have rulings with respect to Mr. Doggett  
10 and Mr. Schuessler turns it around and asks that he  
11 he be allowed more time to get prepared because of that  
12 ruling. It just doesn't make any sense to me.

13 MR. SCHUESSLER: May I respond, sir.

14 MR. COPELAND: I think that he ought to  
15 proceed. I think for the first time, since this hearing  
16 has started, we finally have a week in which we are  
17 coming close to meeting the schedule, and I think every  
18 effort ought to be made to move right ahead and get  
19 that accomplished.

20 JUDGE WOLFE: Yes, Mr. Schuessler.

21 Well, Mr. Black, did you have something to  
22 add?

23 MR. BLACK: I think that since Mr. Schuessler  
24 has his own questions, we could proceed along with his  
25 questions, and if he finds that they may be repititious



13-9 1 with the questions handed by Mr. Doggett, we can deal with  
of 2 that at that time.

3 JUDGE WOLFE: In other words, deal with it  
4 tomorrow.

5 Yes. I see no reason we can't proceed with  
6 your questions right now, Mr. Schuessler, and get along  
7 with it and then overnight you can get -- you can stop  
8 when you reach Mr. Doggett's questions, and review those  
9 for duplicity -- duplication tomorrow.

10 MR. SCHUESSLER: I'd like to say this, sir.

11 We're not discussing this at 2:30 or  
12 3:00 in the afternoon --

13 JUDGE WOLFE: I'm sorry, I didn't hear you.

14 MR. SCHUESSLER: I said we're not discussing  
15 this, this did not come up at 2:30 or 3:00 in the  
16 afternoon, it is 5:00.

17 The hearings are scheduled to go to 5:00,  
18 generally.

19 I have not objected or felt unduly abused or  
20 anything when they exceeded that, but there have been  
21 hearings that have been adjourned at an earlier hour.  
22 One day shortly after lunch, and so forth.

23 I think considering the hour and the  
24 circumstances, that an adjournment to begin on a new  
25 witness at this late time, I think, is --

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1 JUDGE WOLFE: It is not a new witness. It  
2 is not a new witness, it's an old --

3 MR. SCHUESSLER: Well, he's a new witness as  
4 of today.

5 I just don't think it is appropriate at all.

6 MR. COPELAND: Your Honor, I don't see how  
7 Mr. Schuessler could see any harm with proceeding to ask  
8 the questions that he has and came here prepared to ask  
9 today.

10 That is absolutely incomprehensible.

11 MR. BLACK: I would also make the reflection  
12 that usually Mr. Schuessler has a hard time getting here  
13 in the morning, so it would seem like it would serve his  
14 interest to proceed tonight to the extent possible.

15 MR. COPELAND: Exactly.

16 I believe he showed up one day earlier this  
17 week and complained that the reason he couldn't be here  
18 is because he works late at night and sleeps late in the  
19 morning and couldn't be here early.

20 Either he said that or somebody said that  
21 on his behalf.

22 JUDGE WOLFE: Yes.

23 Besides this argument, I am concerned, Mr.  
24 Schuessler.

25 We will begin with --

13-11

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1 MR. SCHUESSLER: Yes, and I am prepared to  
2 be here at that time in the morning. If I can get away  
3 now and do some things that I need to do and get ready  
4 for that I'll be prepared.

5 I plan to be here at 9:30 in the morning.  
6 But, it is going to be exceedingly difficult if I have to  
7 stay here until 6:00 tonight, or 5:30.

8 Now, I'm not --

9 JUDGE WOLFE: How many questions to you have  
10 of your own, Mr. Schuessler --

11 MR. SCHUESSLER: Of my own?

12 I would guess approximately 30 minutes or  
13 more.

14 And, I still have to get to work tonight, I  
15 will make a special effort to be here at 9:30 in the  
16 morning --

17 JUDGE WOLFE: At 9:30?

18 MR. SCHUESSLER: At 9:00. I beg your pardon.  
19 But, it has been a long day and I'm tired and it is an  
20 appropriate time to adjourn these hearings today.

21 (Bench Conference)

22 JUDGE WOLFE: We'll proceed for at least a  
23 half an hour.

24 It is always a good idea to keep plugging  
25 along and get things out of the way so we can proceed.

13-12

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1 We will proceed for half an hour and  
 2 namely, until -- it is now, I have five minutes after five,  
 3 we will proceed until 25 minutes until six.

4 All right, Mr. Dick, you are still under  
 5 oath. All right, Mr. Schuessler.  
 6 Whereupon,

7 J. W. DICK

8 a witness herein, having been previously duly sworn and  
 9 cautioned to testify the truth, the whole truth and nothing  
 10 but the truth, was examined and did further testify upon  
 11 his oath as follows:

12 CROSS-EXAMINATION

13 (Resumed)

14 BY MR. SCHUESSLER:

15 Q Well, Mr. Dick, on page 36, I'm concerned  
 16 about the uncertainties stated for an answer to the first  
 17 question there "The conclusion of this analysis indicate  
 18 that there was much uncertainty . . .".

19 Further down, "The Staff's ability to make  
 20 quantitative prediction about the reduction in power  
 21 demand resulting from conservation was deemed to be  
 22 speculative."

23 I think my questions is after reevaluation of  
 24 these uncertain and speculative assessment is general  
 25 agreement. This is used in the last line, "The Staff has

13-13

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1 reevaluated this assessment and is general agreement with  
2 the analysis and conclusions."

3 Now, I am curious to know how with all these  
4 uncertainties and speculations involved, how solid is  
5 that agreement.

6 And, what does that agreement agree to.  
7 I mean, I'm troubled with having in general agreement in  
8 such highly doubtful area.

9 Can you enlighten me on that, please?

10 A. When I did my analysis on these issues,  
11 I found the same types of uncertainties that were  
12 mentioned -- brought up in the FSFES, and therefore, my  
13 conclusions agreed with these statements from the FSFES.

14 MR. COPELAND: I believe, Mr. Chairman, one  
15 confusion here may be that the work reviewed was changed  
16 to reevaluate.

17 That may constitute part of Mr. Schuessler's  
18 confusion.

19 MR. SCHUESSLER: No.

20 I have that notation, and I believe I read  
21 it as reevaluated.

22 MR. COPELAND: Excuse me.

23 BY MR. SCHUESSLER:

24 Q The Staff considered the potential effects  
25 of retrofit measures.

13-14

cf

1           Can you describe what those measures amount  
2 to or what would be included to mean that general  
3 category, please?

4           Let me put it this way. In the testimony  
5 you mentioned specifically insulation and storm windows.

6           Where there any other -- are there any other  
7 types of retrofitting procedures, or appliances or  
8 whatever?

9           A       In my review of what retrofit measures would  
10 be potentially economic, those were the essential ones  
11 that were deemed to be essentially economic in terms of  
12 providing more benefits than the cost of installing these  
13 measures.

14           Obviously, there are other things that might  
15 be done but in looking at concentrating other small  
16 things that potentially could be done, such as  
17 weatherproofing.

18           But, these smaller things I didn't consider  
19 themselves -- to lend themselves to conservation  
20 programs of direct investment.

21           Q       Okay.

22           I believe you said that these would be most  
23 appropriate to residential use.

24           Is that correct?

25           A       Yes.

13-15

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1 Q Okay.

2 I think that brings us to the question of  
3 how this -- what sort of programs might be considered to  
4 bring this about.

5 Did you propose or consider other programs  
6 that are instituted and promoted by the utility companies  
7 themselves, just in a broad way.

8 Or, what other stimulation might there be to  
9 encourage retrofit measures?

10 A This analysis was based on the assumption  
11 that it would in some way be carried out as an incentive  
12 by the utility company to the residential homeowners.

13 So, essentially, that was the question I  
14 asked in doing this analysis.

15 Q Okay.

16 The incentives would be -- then, do you have  
17 any idea what form these incentives would take on the  
18 part of the utility company?

19 A Well, the contention, I believe, addressed  
20 direct investments by the utility in the residential  
21 sector of the service territory.

22 Or direct investment by the utility in the  
23 service territory period, without specifically including  
24 that.

25 Q Well, what comes to my mind in that answer

13-16

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1 would be, you are suggesting the utility company going into  
2 the storm window and insulating business; or something of  
3 that sort or nature.

4 Or, are you thinking -- or also, possibly  
5 financing this --

6 A Well, I think the direct investment program  
7 implies that there would be some sort of financial  
8 incentive provided by the utility, that's more or less,  
9 to me, what that implies.

10 Q Yes.

11 I'm just trying to understand what form that  
12 would be.

13 Whether it, conceivably, would be lower  
14 rates or --

15 A Well, I think you can look around and see in  
16 some cases where, for instance, TVA has encouraged, has  
17 encouraged retrofitting homes in its service territory  
18 through providing no-interest loans whereby the residential  
19 homeowner pays back the investment by the utility in the  
20 conservation measure through increased rates over a period  
21 of time.

22 That's one possibility.

23 There's others that some utilities in the  
24 northwest part of the country have set up some programs  
25 which take other tasks.



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Q Okay.

Pursue that a little further.

My impression is that -- you know, I'm troubled with that from the standpoint that it seems unlikely that a profit making company or corporation would be terribly interested in embarking on programs that would cut the need for their product, and, therefore, reduce their profits and that to reduce the demand for their product, in other words.

So, is it realistic that any companies would do this?

What would be their motivation, in other words?

A Well, I would think you'd have to look at the characteristics of the utility.

For instance, in the northwest part of the country where additional capacity is much more expensive than the existing capacity, because they have quite a bit of hydro-power; and bringing on new capacity is much more expensive. And, would tend to increase the rates.

And, by providing incentives for conservation they feel that it is not only to the benefit of their customers it is also to the benefit of the utility, in terms of avoiding these higher costs of capacity expansion.

cf

1 Q Okay.

2 Now, do you recall, as I think I do, after  
3 the first oil embargo back around '72 when we had the  
4 big energy conservation move or push there, it seems to  
5 me I recall the number of the energy producers, including  
6 electric utility companies, then began to scream a little  
7 bit and wanted rates increased because their incomes  
8 has dropped.

9 Conservation had occurred, but they felt  
10 they should not be hurt in the pocket book.

11 Do you remember those sorts of stores?

12 A I think if you look back to that time there  
13 were -- the price of fuels for many utilities were going  
14 up much faster than they could keep up with in terms of  
15 the revenue they were raising based on their rates.

16 And, because of those sorts of problems,  
17 rapidly increasing fuel prices, many utilities now have  
18 fuel adjustment clauses that allow them to incorporate  
19 rapidly increasing fuel prices into their rates rather  
20 quickly. As opposed to waiting sometime for a rate  
21 hearing.

22 And, in this intervening time having their  
23 revenues or their profits reduced through higher fuel  
24 costs, which aren't being made up in the rates.

25

14-1

BY MR. SCHUESSLER:

1  
2 Q Okay. Thank you.

3 The self-generation -- Can you describe or  
4 give me an example of how that would go about, or how  
5 would that come about -- Let me ask -- redo that  
6 question.

7 Do you know of any self-generation projects  
8 that exist presently, just by way of providing an example  
9 or two?

10 A I haven't studied any specific ones in detail.  
11 I know that self-generation projects are currently going  
12 on and are being planned for the future by major  
13 industries.

14 Q Okay.

15 That means that they will produce the  
16 electricity for their own use, right?

17 A Yes.

18 Q What means -- What fuel sources are avail-  
19 able under the federal fuel regulations and so forth?  
20 Are they any freer to use certain fuels, say, than a  
21 commercial utility?

22 A I think perhaps different rules apply to  
23 industries, depending on their sizes. And so in some  
24 ways, some industries would probably be able to use fuels  
25 that utilities are discouraged from using, specifically

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1 natural gas and oil.

2 Q Okay.

3 Do you know what direction, fuel-wise, such  
4 projects are going? You say there are projects planned.  
5 You can't think of any specifically, but in a general  
6 way, what is the concept of self-generation from a fuels  
7 standpoint?

8 MR. COPELAND: Your Honor, I'm going to object  
9 to this question.

10 It seems to me it has strayed beyond the con-  
11 tention. We're talking about co-generation in some sort  
12 of undefined sphere of the world, and it seems to me  
13 that that is beyond the scope of this contention, which is  
14 specific as to Houston Lighting & Power Company's system.

15 MR. SCHUESSLER: We're discussing conserva-  
16 tion. And the Staff -- or Dr. Dick mentioned specifically  
17 the methods that might bring about a certain conservation  
18 as far as the demand or need of the utility company.

19 Self-generation is one of them. I'm exploring  
20 the feasibility, the likelihood of such self-generation  
21 coming about here in Houston, that might reduce the need  
22 for power from HL&P.

23 MR. COPELAND: Your question is related  
24 specifically to HL&P's industrial customers?

25 MR. SCHUESSLER: I beg your pardon.

1 MR. COPELAND: The question you just asked is  
2 related specifically to Houston Lighting & Power Company's  
3 industrial customers?

4 MR. SCHUESSLER: No, I'm trying to get an idea  
5 of just how realistic this type of conservation measure  
6 is, what the prospects are for it.

7 Both in an overall general way -- and I guess  
8 ultimately, as far as Houston is concerned ...

9 MR. COPELAND: Then I do object to the question,  
10 Your Honor, as going beyond the scope of the contention.

11 JUDGE WOLFE: Why don't you limit it to  
12 HL&P customers?

13 MR. SCHUESSLER: Okay.

14 BY MR. SCHUESSLER:

15 Q Dr. Dick, have you made a study directly  
16 related to the Allens Creek Project or HL&P's need for  
17 production of power, which would indicate what the prospects  
18 would be for self-generation in regard to conservation  
19 measures?

20 MR. COPELAND: On Houston Lighting & Power's  
21 system?

22 MR. SCHUESSLER: I thought I said that.

23 JUDGE WOLFE: Yes. That's part of the  
24 question, Doctor.

25 THE WITNESS: Well, I haven't made a specific

14-4

1 study as to the potential of self-generation in the  
2 Houston Lighting & Power service territory. I'm aware  
3 that the Houston Lighting & Power forecast methodology  
4 has specifically taken this into account by canvassing  
5 its largest customers, which would be the customers most  
6 likely to have such a project, and incorporating this  
7 into their forecasts.

8 And where they have not specifically ascer-  
9 tained in some future year what that would be, they made  
10 an assumption as to a continuing increase in self-  
11 generation in their service territory.

12 BY MR. SCHUESSLER:

13 Q Okay.

14 Can you identify where that information is  
15 available in Houston Lighting & Power information? Is  
16 it in any of the material related to Allens Creek?

17 A It was --

18 Q In other words, would it be available to me  
19 from that source or from where?

20 A Well, they have mentioned this technique in  
21 describing their forecast methodology. I have had personal  
22 communication with Houston Lighting & Power in which they  
23 indicated to me what specific assumptions they were  
24 making in terms of self-generation.

25 Q Describing the manner in which you got this

14-5

1 information suggests to me that you could not tell me  
2 where I could find -- or where that information would be  
3 available to us. Is that correct?

4 I'm just trying to understand. That's the way  
5 I understand you. Is that correct?

6 A I don't know that it's in any public document.  
7 It may be. I just ...

8 Q You can't identify a source for us then --  
9 for me, other than HL&P?

10 A That's right.

11 Q Okay.

12 Now I am confused about rate restructure.  
13 You mentioned that.

14 When coming across that phrase initially,  
15 rate restructuring to me as a conservation measure would  
16 seem to me to be a method that would mean increasing  
17 rates, therefore, bringing about a measure of resistance,  
18 so to speak, to the use of power -- electricity; and  
19 thereby create conservation.

20 But in reading a little further in there, I  
21 find that it's described as really kind of being counter-  
22 productive.

23 Could you explain that to me a little bit.  
24 I read it, but I can't say I fully appreciate what the  
25 meaning is.

14-6

1 A Okay.

2 Well, first of all, the utility is constrained  
3 on the amount of profit they can make by the Utility Com-  
4 mission. And, therefore, they are allowed to set their  
5 rates based on what their revenue requirements are. Now  
6 these are related to their costs, expenses and the amount  
7 of equity they have tied up.

8 So if they increase certain rates to dis-  
9 courage consumption by certain customers, then if we assume  
10 that they need the same revenue requirements as they did  
11 before they increased the rates, then you might have to  
12 decrease rates in some other part of your rate structure  
13 to some other customer.

14 And this discouraging of consumption by some  
15 customers by increasing rates, and then going ahead and  
16 decreasing rates to other customers will increase -- or  
17 encourage these other customers to consume more  
18 electricity, or perhaps it would happen that they would  
19 change their rates over certain periods of the day, like  
20 put in a time-of-day rate whereby certain times of the  
21 day where it's more expensive to generate electricity, the  
22 prices are higher.

23 And so people are discouraged to consume  
24 electricity during that time of day. But other times of  
25 the day when the costs of generating electricity are lower,

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1 they would have lower rates. And that would encourage  
2 consumption during that period.

3 So these various effects could very well wash  
4 out, and total consumption of kilowatt hours would stay  
5 approximately constant.

6 Q Well, thank you for that answer. But I  
7 think I'll have to read the transcript to fully understand  
8 it.

9 But the -- That suggests to me then that that  
10 is not a really significant conservation incentive then.  
11 Am I correct in that?

12 A Well, it's significant -- It could be signi-  
13 ficant from the sense of reducing the need for peaking  
14 capacity.

15 In other words, you could level your load  
16 so your demand throughout the day is more level; and it  
17 doesn't require capacity for just a small time period  
18 during the day.

19 It doesn't require as much capacity for a small  
20 time period during the day when you have a peak. So  
21 thereby, you would be saving expense, in terms of less  
22 need for peaking units.

23 But at the same time you would perhaps be  
24 deferring that load to other times of the day and have more  
25 need for baseload or the low cost generating capacity.

1 Q Okay.

2 Are those the only three -- Those are the  
3 only three I've found.

4 Are those the only three general categories  
5 which were considered in this study of conservation mea-  
6 sures?

7 A That pretty much encompasses all of the  
8 customers.

9 Q Okay.

10 The reason I asked, is I wonder if there is one  
11 more that might have been considered and isn't. I'd like  
12 to get your views on that.

13 Would it not be reasonable to assume --  
14 recognize certain realities of the general increasing costs  
15 of energy --

16 What I'm referring to specifically is the  
17 increasing cost of natural gas, which is used quite a  
18 bit in the residential area (probably mostly, as far as I  
19 know) and the cost of automobile fuel.

20 MR. COPELAND: Your Honor, I'm going to object  
21 to that question. That's beyond the scope of the con-  
22 tention.

23 The contention is very specific as to the  
24 energy conservation measures that TexPirg believes should  
25 have been considered.

14-9

1 And the language that Mr. Schuessler has been  
2 looking at is simply a restatement of those three things  
3 that TexPirg contended should have been evaluated.

4 If you'll look on page 36, the three measures  
5 that are set out there in answer to the second question are  
6 nothing more than the three things in (a), (b) and (c)  
7 of TexPirg's contention.

8 JUDGE WOLFE: Page --

9 MR. COPELAND: -- i. e., retrofit measures,  
10 self-generation and rate restructure.

11 MR. SCHUESSLER: I'd like to ask the Staff  
12 why another conceivable conservation-related consideration  
13 was not brought in.

14 JUDGE WOLFE: And that is?

15 MR. SCHUESSLER: That is -- if I may be per-  
16 mitted to ... you know, put it out.

17 What I'm getting at is that I wonder if they  
18 considered the psychological impact of just generally  
19 increasing prices of energy.

20 My thinking is that when you get -- The  
21 average family gets to a point where they're really  
22 pressed -- I think they're there already. They're  
23 really pressed for the weekly budget.

24 And there comes a time, I think, when they  
25 would say, "Hey, we've got to cut down."

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1 And in my own case, no matter how high gasoline  
2 gets, I'm not going to be able to conserve any.

3 But I may try to conserve dollars elsewhere.  
4 One of the easiest ways to do that, I submit -- and most  
5 convenient -- would be to cut down on electricity.

6 I'm just wondering if they considered this;  
7 and if not, why not.

8 MR. BLACK: Mr. Chairman, the Staff concurs  
9 in Mr. Copeland's objection that this testimony clearly is  
10 only to respond to those three specific things that TexPirg  
11 brought out in its Contention 7(a) through (c).

12 That's set forth on page four of this testi-  
13 mony.

14 And recognizing the fact that Mr. Schuessler  
15 is a layman, and perhaps doesn't understand the procedures  
16 whereby we file testimony only pertaining to the con-  
17 tentions that have been negotiated and accepted as issues  
18 and controversy in these proceedings ... but it clearly  
19 is outside the scope of the contention.

20 And the question should not be allowed.

21 MR. SCHUESSLER: I don't believe it's outside  
22 the scope of his testimony.

23 MR. COPELAND: Well, Your Honor, as he  
24 described it, it is clearly a question of price  
25 elasticities of demand between all choices by consumers ...

1 you know ... "Am I going to drive my car or cool my  
2 house?"

3 It's clear what the question is that he's  
4 pursuing.

5 (Bench conference.)

6 MR. SCHUESSLER: I have a note here --

7 JUDGE WOLFE: Just a moment, Mr. Schuessler.

8 (Further Bench conference.)

9 JUDGE WOLFE: The Board has reviewed TexPirg's  
10 7(a)-(c) admitted contention.

11 It would seem that Mr. Schuessler's question  
12 falls within Subparagraph (c) of that energy conservation  
13 contention.

14 I take it your question to the witness is:  
15 Why didn't you consider the possibility of increasing  
16 HL&P's rates in order to encourage conservation?

17 Is that the question you were putting to the  
18 witness?

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14-12

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1 MR. SCHUESSLER: I think it had something to  
2 do with an earlier question, sir; but I don't honestly  
3 think it applies here.

4 My question here is whether they considered --  
5 or why didn't they consider the impact of increasing  
6 gasoline and natural gas prices, which would result in a  
7 greater effort --

8 JUDGE WOLFE: When you say "they," who is  
9 "they" should increase gasoline and natural gas prices?

10 MR. SCHUESSLER: I don't know that I said  
11 "they."

12 I'm sorry. What I'm saying is when --  
13 Well, okay.

14 The oil companies.

15 When the gasoline prices are going up, and  
16 will continue -- and natural gas prices are -- There's  
17 discussion ... or, you know, proposals to decontrol that,  
18 so those two energy sources are going to increase in  
19 price.

20 That, I'm suggesting, would bring pressures  
21 upon the household budget, which would call for -- or at  
22 least create a resistance to the spending of the energy  
23 dollar.

24 My thinking is that it will be most easy and  
25 most convenient to conserve on electricity dollars by

14-13

1 simply reducing the lighting, turning the thermostat up  
2 a little.

3 In other words, it would be most convenient --  
4 and I wonder if that is not an impact that will be well  
5 considered by the time this issue is even settled ... be-  
6 fore this hearing is over and you people enter a decision  
7 on it.

8 MR. COPELAND: Your Honor --

9 JUDGE LINENBERGER: Mr. Schuessler, we've got  
10 a problem here, because gasoline prices and natural gas  
11 prices are outside the control of HL&P.

12 So how can they -- What can they do about  
13 electricity working through gasoline prices? HL&P has no  
14 nothing to say about gasoline prices.

15 MR. SCHUESSLER: I don't think they have a  
16 need -- or they have a control over it, but it will have  
17 an impact on their need for power -- the demand for  
18 power.

19 It would be modified --

20 JUDGE LINENBERGER: The contention, Mr.  
21 Schuessler --

22 MR. SCHUESSLER: That's outside the con-  
23 tention -- all right.

24 JUDGE WOLFE: Yes. So I don't think we have  
25 to go any farther with that.

14-14

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1 The objection is sustained. The question was  
2 outside the scope of the contention.

3 MR. COPELAND: Your Honor, I would note for  
4 Mr. Schuessler's benefit that all of those kinds of con-  
5 siderations are taken into account in the load forecasting  
6 through the elasticity coefficients.

7 There's no question here, but that everything  
8 like that is ultimately considered.

9 JUDGE WOLFE: All right.

10 It's now 5:35. We have a couple of more  
11 minutes.

12 What's the scheduling now for tomorrow (Thurs-  
13 day) and Friday?

14 MR. COPELAND: We will proceed with the two  
15 witnesses --

16 JUDGE WOLFE: We'll complete this cross-  
17 examination tomorrow.

18 MR. COPELAND: Yes, sir.

19 JUDGE WOLFE: Then thereafter, what's the  
20 first order of business?

21 MR. COPELAND: Dr. Schlicht and --

22 JUDGE WOLFE: Dr. Mickelson --

23 MR. COPELAND: -- and then Dr. Reid tomorrow.

24 JUDGE WOLFE: Drs. Schlicht and Reid?

25 MR. COPELAND: Yes, sir. Those are the two



14-15 1 witnesses on the impacts of transmission lines on water-  
2 fowl.

3 MR. SCHUESSLER: What's the last name? Reid?

4 MR. COPELAND: And then Friday will be Dr.  
5 Mickelson and Mr. Gears, who will testify on the health  
6 effects of transmission lines.

7 JUDGE WOLFE: The Board was wondering about  
8 when Mr. Scott is going to present Mr. Johnson on --  
9 what was that? Alternative sites? And energy conserva-  
10 tion.

11 And what was the third subject? I've forgotten  
12 now.

13 MR. COPELAND: Your Honor, if you'll recall,  
14 I believe that sometime last week Mr. Scott -- I believe it  
15 was on February 13th -- Friday, February the 13th -- he  
16 indicated that he would like to call Mr. Johnson to  
17 testify at one time as to all of the matters that were in  
18 his testimony.

19 Mr. Black and I both indicated that was fine  
20 with us.

21 And I talked to Mr. Scott last week about  
22 the timing of that. He indicated that he would like to  
23 call him next Friday.

24 JUDGE WOLFE: A week from this Friday?

25 MR. COPELAND: Yes, sir.

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JUDGE WOLFE: All right.

MR. COPELAND: I would like to get all of my witnesses on next week on all of the alternate siting questions before we get to Mr. Johnson.

JUDGE WOLFE: And I also have in the back of my mind -- with Mr. Scott, that some determination was going to be made whether his witness, Dr. Marrack, was to have any more oral direct testimony.

Have you heard anything about that?

MR. COPELAND: He has never indicated to me that he wants him -- But I'll have to speak to him.

JUDGE WOLFE: Well, we'll just have to wait for him to appear and find out what he plans to do.

All right.

We'll be -- Yes, Mr. Black.

MR. BLACK: One other thing.

I was talking to Dr. Marrack today, and he just kind of indicated to me in an aside that he had to figure out when he could schedule his witness on the transmission waterfowl issue.

As you'll recall, he mailed a statement to the Board and parties that he was going to call a witness -- or an official of the State of Texas as his witness.

As far as I'm concerned, we probably don't have to spend much time on that particular problem at this

14-17

1 time. But I thought I would bring it to your attention  
2 that he's still intending on calling that witness for --

3 JUDGE WOLFE: He has presented no written  
4 direct testimony on that, has he? I don't recall that he  
5 has.

6 MR. BLACK: That's correct.

7 JUDGE WOLFE: Yes. Well, that's the fly in  
8 the ointment, isn't it?

9 (Laughter.)

10 JUDGE WOLFE: All right. Nine o'clock --  
11 Yes.

12 MR. COPELAND: Your Honor, could we get --  
13 Is Mr. Schuessler definitely planning on coming back  
14 here at nine in the morning?

15 MR. SCHUESSLER: I plan to be here at nine  
16 in the morning, yes, sir.

17 JUDGE WOLFE: All right.

18 (Whereupon, at 5:40 p.m. the hearing was  
19 recessed, to reconvene Thursday, February 26, 1981,  
20 at 9:00 a.m. in the same place.)

21 - - -

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This is to certify that the attached proceedings before the

NUCLEAR REGULATORY COMMISSION

in the matter of: HOUSTON LIGHTING & POWER COMPANY

DATE of Proceedings: February 25, 1981

Docket Number: 50-466

Place of Proceedings: Houston, Texas

were held as herein appears, and that this is the original transcript thereof for the file of the Commission.

Mary L. Bagby  
Official Reporter (Typed)

Mary L. Bagby  
Official Reporter (Signature)