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PROCEEDINGS

JUDGE MOSS: Good morning, everybody.
We're here to commence day three of our
evidentiary hearing, and Dr. Dubin is our first
witness; is that correct?

MS DODGE: Yes.

JUDGE MOSS: Did I get that right? Is it
"Dr." or "Mr."?

THE WITNESS: "Dr." is fine.

JEFFREY DUBIN, Ph.D.,
produced as a witness in behalf of The Company,
having been first duly sworn, was examined and
testified as follows:

JUDGE MOSS: Please be seated. Thank
you. Go ahead.

DIRECT EXAMINATION

BY MS. DODGE:

Q Dr. Dubin, do you have before you your
testimony and exhibits in this matter, which have
been identified as Exhibits 111 through 127?

A I do.

Q And were your testimony and exhibits
prepared by you or under your direction?

A They were.

Q Do you have any additions or corrections
to make to any of that testimony at this time?

A I do.

Q Would you please explain those to us?

A I have one errata correction to make at
page 26.

Q Of Exhibit --

A 111. And that is at the answer to the
question at line 7, there's a number, 696.2. It
should be 755.2. And when you are ready, I will
continue with the others.

JUDGE MOSS: Let's pause there for a
second. But for some reason, I don't have any
page after 25. Wait a minute. Were there some
revisions?

MS. DODGE: There was a revision to 25,
and then 26 continues.

JUDGE MOSS: That explains it. I turned
to the end, and I do have 26. I apologize.

MS. DODGE: It's page 26, line 9.

THE WITNESS: The change is to 755.2.

JUDGE MOSS: All right. Thank you. All
right. Dr. Dubin, go ahead. Thank you.

THE WITNESS: And then within Exhibit 125,
which is my prefiled rebuttal testimony, if we
could look at page 22. And I am revising the

6 question and answer starting at line 7. And I
7 would like to strike the question and answer. I
8 would be happy to explain the reasons why if
9 anybody is interested, but I prefer to just
10 strike it at this time.

11 But I would like to move the footnote,
12 which is at page 23 of 27, footnote 12, I would
13 like to move that to the end of the answer at
14 line 5 of page 23 to preserve the footnote. And
15 I have one more correction.

16 JUDGE MOSS: Go ahead.

17 THE WITNESS: Page 24 of the same exhibit,
18 at line 16, I would like to strike the word -- or
19 change the 46 percent to 42 percent. This is an
20 errata. And also at line 18, change the 600,000
21 to 541,000.

22 Q BY MS. DODGE: Dr. Dubin, with those
23 changes, are the answer to the questions in
24 Exhibits 111 through 127 true and accurate to the
25 best of your knowledge?

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1 A Yes.

2 MS. DODGE: Your Honor, we offer Exhibits
3 111 through 127 into evidence, and present
4 Dr. Dubin for cross-examination.

5 JUDGE MOSS: Apparently being no
6 objection, those will be admitted as marked.

7 (EXHIBIT 111 to 127 RECEIVED.)

8 JUDGE MOSS: I have ICNU down for 15
9 minutes, and Public Counsel, 15, and Staff down
10 for 20. Is there any preference on order?

11 Mr. Cedarbaum, why don't you proceed.

12

13 CROSS EXAMINATION

14

15 BY MR. CEDARBAUM:

16 Q Hello, Doctor. I turned my mic on. My
17 questions concern the issue that exists between
18 the Company for your testimony, and the Staff
19 witness, Dr. Mariam, over the price of natural
20 gas to be used in the power gas analysis. And is
21 it correct that in the Company's direct case it
22 proposed a price of \$4.39 per MMBTU based on 10
23 day forward market price strips for the period
24 12/22/2003 through January 8, 2004?

25 A I don't recall. It sounds approximately

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1 correct.

2 Q You would accept that subject to check?

3 A Yes.

4 MS. DODGE: That's in the record, Your
5 Honor, so the witness ought not be asked to check
6 it.

7 JUDGE MOSS: Well, the witness needs to
8 accept it subject to check, or acknowledge it so
9 the questions that follow will make sense. So
10 that's fine. It's a standard of procedure to

11 check it, and then he can check the testimony and
12 confirm that.

13 MS. DODGE: My concern is that the subject
14 to check seems to have expanded from what is
15 meant to be clearly a witness appropriate to the
16 subject checking a calculation, versus being
17 asked to somehow admit evidence that exists in
18 the record, and so it simply could be referred
19 to.

20 He could be asked to assume that that is
21 correct and go forward, but I don't think the
22 burden should be shifted to a witness to check
23 something that is or is not in the record.

24 JUDGE MOSS: I don't see it in the same
25 fashion that you do. To me, it's simply an

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1 acknowledgement of the fact, and if the witness
2 is uncomfortable accepting it subject to check
3 they can then -- we can find some other way to
4 verify it by referring him to a point in the
5 record and doing that on the stand.

6 It's merely an expedient way to let the
7 questioning go forward on detailed information
8 that the witness may or may not be fully aware
9 of.

10 MS. DODGE: Your Honor, the difficulty is
11 that the rules place the burden on the witness
12 once the check is accepted to come back and file
13 an affidavit with the Commission if there's
14 something incorrect. So it's a tremendous burden
15 placed on the witness.

16 I think the expedient thing to do would be
17 simply to say, "assuming that's correct," and go
18 forward.

19 JUDGE MOSS: That will work fine, too.

20 MR. CEDARBAUM: I didn't mean to cause
21 this problem. I was trying to get some context
22 to the issue that I'm going to discuss with
23 Dr. Dubin so.

24 MS. DODGE: I have no objection to the
25 question if it's on an assumption basis, rather

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1 than a subject to check.

2 MR. CEDARBAUM: Okay.

3 Q BY MR. CEDARBAUM: So, Dr. Dubin, let's
4 assume, for the sake of this discussion, that the
5 Company's direct case was as I characterized it.
6 Okay?

7 A Okay.

8 Q And in rebuttal, which now we're shifting
9 to your testimony, the Company proposes \$5.60 per
10 MMBTU price for gas using the three-month average
11 Nymex forward prices for the period ending
12 September 30, 2004; is that right?

13 A Again, I don't recall the specific figure.

14 Q You are not sure, sitting here today, what
15 the Company's proposed gas price is for the power

16 cost analysis?

17 A I don't recall the specific dollar amount,
18 no.

19 Q They used your analysis for that purpose,
20 didn't they?

21 A They used my analysis, in part, to justify
22 a three-month average.

23 Q Do you know, would you agree that the
24 Company's proposal on the three-month average is
25 a modification to the Staff study, which

0619

1 calculated a \$4.69 MMBTU gas price based on a
2 three-month rolling average for price quotes from
3 December 2003 through April 2004?

4 A I don't know if it's a modification of
5 what Staff did or not. It's a three-month
6 rolling average that the Company decided to
7 employ.

8 Q Your testimony as presented in response to
9 Dr. Mariam's; is that right?

10 A Yes.

11 Q Do you understand what Dr. Mariam did?

12 A Yes, I do.

13 Q Did he use a three-month rolling average
14 price quote for the period December 2003 through
15 April 2004?

16 A He used many averages, including a
17 three-month rolling average. Yes.

18 Q Do you understand -- you understand that
19 Staff's proposal is the \$4.69 price?

20 A That's derived by taking a three-month
21 rolling average of various forward prices, and
22 employing a simple average after eliminating a
23 certain period of time. It's a complex analysis,
24 and the Company's analysis is somewhat different
25 than that.

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1 Q So you do understand that Staff's analysis
2 is based on a three-month rolling average price
3 quotes for December 2003 through April 2004?

4 A Staff's, yes.

5 Q Is it correct that in your analysis you
6 used forward gas prices to forecast spot gas
7 prices during the rate year?

8 A I wouldn't characterize my analysis that
9 way, no.

10 Q You use forward gas price in your
11 analysis, don't you?

12 A I do.

13 Q For what purpose?

14 A To examine the issue of strip length,
15 which is the averaging period in question, to
16 respond to Dr. Mariam's analysis. In other
17 words, my analysis used forward prices to analyze
18 the question of cohesion or coherence with spot
19 prices, and to examine the issue of how to form
20 an average over a certain lengths of time as one

21 is farther out from the rate year in question,
22 and to choose which forward average period would
23 be the best.

24 Q And is it your testimony that you believe
25 the forward gas prices are the best analytical

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1 tool for doing that process that you just
2 described?

3 A The best analytical tool for doing what
4 process? I don't follow your question.

5 Q I was just asking you, you described what
6 you did?

7 A Yes.

8 Q And I am asking you, is it fair to draw
9 from that that you believe the forward gas prices
10 are the best predictor or tool to use for the
11 purpose that you used them?

12 A Well, my analysis was analysis of forward
13 prices as they relate to spot prices. So I don't
14 know how I could avoid or say that they were the
15 best, or they were the only prices that apply to
16 future spot periods in the context in which I
17 studied them.

18 Q In your use of the gas forward gas prices,
19 as you discussed, were you basing your analysis
20 on the assumption that the market for natural gas
21 is an efficient market?

22 A I looked into that issue, but I did not
23 assume that the market was efficient. Nor did I
24 conclude that it wasn't efficient.

25 Q So you didn't study that the efficiency of
0622

1 the market was not relevant to your analysis?

2 A Well, actually the efficiency of the
3 market was something I did subsequently study,
4 but it was not the issue that I analyzed in my
5 rebuttal testimony in the main.

6 Q If you could turn to what has been marked
7 for identification as Exhibit 128.

8 A (Complies.)

9 Q And looking at the first two pages -- and
10 I am, for purposes of the record, I am counting
11 the pages from the handwritten ones in the bottom
12 right-hand corner. It's actually the same as the
13 typewritten pages for the first two pages.

14 But do you recognize the first two pages
15 of Exhibit 128 as your response to Staff's Data
16 Request 293?

17 A Yes.

18 Q And the remaining pages, handwritten pages
19 3 through 19, is the -- consists of the third
20 document that you list on page 1 of the exhibit;
21 is that right?

22 A I don't have those remaining pages in

23 front of me.

24 Q Is this the article by Mazighi?

25 A Yes.

0623

1 Q Yes. I believe we did provide that to
2 counsel as part of the cross exhibit exchange
3 last week.

4 MS. DODGE: Just a minute. (Handing
5 documents.)

6 THE WITNESS: Yes, I have it in front of
7 me now. Thank you.

8 Q BY MR. CEDARBAUM: So the article that you
9 reference under item three on page 1 is the
10 attachment to the exhibit, to the best of your
11 knowledge?

12 A Yes.

13 MR. CEDARBAUM: Your Honor, I would offer
14 Exhibit 128.

15 JUDGE MOSS: If there's no objection, it
16 will be admitted.

17 (EXHIBIT 128 RECEIVED.)

18 Q BY MR. CEDARBAUM: Dr. Dubin, in your
19 rebuttal testimony there's a lot of discussion of
20 statistical analysis between of the relationship
21 between forward prices and spot prices. And as a
22 general matter, would you agree that in
23 performing statistical analysis that the data
24 should be cleaned of what are outliers or
25 aberrations?

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1 A That's a complex question.

2 Q Maybe you can answer "yes" or "no," and
3 give an explanation. That would be fine.

4 A I guess the general answer would be no, I
5 would not recommend cleaning outliers. Some
6 statisticians believe that it's necessary to
7 check for outliers in data. Once you discover
8 that the outlier is present, you should go back
9 and question why that outlier is present, whether
10 it's a data error or data entry error, something
11 that has happened in the market that has led to
12 you to miss something in an econometric model,
13 that sort of thing. But as a rule, one does not
14 automatically clean outliers. One makes
15 adjustments for them.

16 Q Would one of the adjustments be to remove
17 them once you have done the analysis, look at
18 them, as you say?

19 A One could remove them if that were
20 appropriate in a given context, yes.

21 Q And one would remove them because keeping
22 them in might negatively affect the conclusions
23 that you would draw from a statistical analysis?

24 A It all depends on the statistical model
25 that is being examined. As I said before, if you

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1 discover an outlier you have to learn something
2 from it. You have to ask the question, why does
3 the model think that that point is an outlier.

4 It could be a data transcription error, a
5 research assistant made an incorrect number, or
6 it could be that the model has failed to pick
7 something up. And depending on what the analyst
8 finds in that circumstance, the response of the
9 analyst will be different.
10 Q Okay. But my question was directed to
11 what you would do after you have looked at the
12 outlier, tried to understand it, and have come to
13 the conclusion that it should be removed.
14 A If one comes to the conclusion it should
15 be removed, then I suppose one should remove it.
16 Q And if one does not remove it from the
17 statistical analysis, the conclusions that would
18 be drawn from that statistical analysis might be
19 adversely affected?
20 A Not necessarily. I could give you an
21 example, if you like.
22 Q My question was, it could. Is your answer
23 "yes" or "no"?
24 A Anything is possible. It depends on the
25 situation at hand.

0626

1 Q So your answer would be "yes"?
2 MS. DODGE: Your Honor, asked and
3 answered.
4 MR. CEDARBAUM: I don't think I got the
5 answer I was looking for.
6 MS. DODGE: Maybe not --
7 JUDGE MOSS: Let's let the witness answer
8 "yes" or "no," if he can, or he can say so if he
9 can't.
10 THE WITNESS: Yes, it's possible.
11 Q BY MR. CEDARBAUM: If you were to look at
12 page 16 of your rebuttal testimony --
13 A (Complies.)
14 Q And that's Exhibit 125. You begin the
15 discussion of the statistical analysis that you
16 performed for the relationship between forward
17 prices and spot prices; is that correct? That's
18 the beginning of that discussion?
19 A Yes.
20 Q And you indicate that you relied upon
21 Nymex data from April of 1990 to October 2004 for
22 forward contracts, and the Nymex data from
23 January 1991 to October 2004 for closing spot
24 prices. Do you see that?
25 A Yes.

0627

1 Q The period of time that we have the 1990
2 to 2004 and 1991 to 2004 period would include the
3 Western Power Crisis of the 2000-2001 period?
4 A Yes.
5 Q If you flip to your rebuttal testimony at
6 page 20 -- and this will get, to some extent, the
7 reason for your deletions on page 22 that you
8 have discussed this morning.

9 But on page 20, you begin a criticism of a
10 Staff decision to use forward prices for the
11 months of December 2003 through April 2004, but
12 then excluding the period May to July of 2004 in
13 order to forecast rate year spot prices; is that
14 correct?

15 A Yes.

16 Q And then at the top of page 22, again with
17 respect to this issue concerning Dr. Mariam's
18 exclusion of those later months, you refer to his
19 calculations as a normality. And then you say,
20 did not report the results in any testimony. Do
21 you see that?

22 A I see that.

23 CHAIRWOMAN SHOWALTER: What line is that?

24 MR. CEDARBAUM: I am sorry. Right at the
25 top. It would be lines 4 through 6 in answer to

0628

1 the question on line 2 on page 22.

2 CHAIRWOMAN SHOWALTER: Thank you.

3 Q BY MR. CEDARBAUM: If you could turn to
4 page 29 for identification.

5 A (Complies.)

6 Q Do you recognize this as the Staff
7 response to Company Data Request No. 43 with
8 reference to this issue that we're talking about,
9 about the exclusion of May through July months
10 for 2004?

11 A Yes. This was an exhibit prepared by
12 Staff that attempts to answer that issue.

13 Q These were workpapers that were provided
14 to you during the discovery phase of this case;
15 is that right?

16 A Yes.

17 Q So you had these workpapers in your
18 possession when you prepared the rebuttal
19 testimony?

20 A Yes.

21 Q If you could look at the handwritten page
22 of the exhibit, it's No. 1, but it's actually the
23 second page of the exhibit.

24 A (Complies.)

25 MS. DODGE: Your Honor, for the record,

0629

1 does Exhibit 129 now contain the cover page, the
2 first page to the Data Request Response?

3 JUDGE MOSS: It does. It was distributed
4 to the bench this morning. I assumed counsel had
5 it as well.

6 MS. DODGE: We do have it, and that would
7 be --

8 MR. CEDARBAUM: That was an oversight on
9 our part, which I discussed with Ms. Dodge this
10 morning, and we hoped that would clear that up.

11 Q BY MR. CEDARBAUM: So looking at the
12 second page of the exhibit with the handwritten
13 note at the bottom, this page is, as you

14 understand, is Dr. Mariam's analysis of normality
15 for the period May 3, 2004 to July 16, 2004 all
16 related to the rate year; is that right?

17 A The first page relates to the period May 3
18 to July 16. Did you say July 16?

19 Q That's what I meant to say, if I did not.
20 You are right. It's July 16.

21 A Subject to that, this is Staff's analysis
22 on that issue, yes.

23 Q And then flipping to the next page, this
24 is Staff's analysis of normality for the period
25 December 22nd, 2003 to April 30, 2004; is that

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1 right?

2 A I have it as December 22, 2003 through
3 April 30, 2004. Is that what you said?

4 Q Again, maybe I am -- that's what I meant
5 to say.

6 A Okay. Well, subject to that, that is what
7 this exhibit is.

8 Q And the third page is the Staff analysis
9 for the period December 22, 2003 to July 16,
10 2004?

11 A Yes.

12 CHAIRWOMAN SHOWALTER: Dr. Dubin, can you
13 use the microphone a little closer, or maybe
14 position it so you are more often speaking into
15 it?

16 THE WITNESS: Okay. Thank you.

17 CHAIRWOMAN SHOWALTER: Thanks.

18 Q BY MR. CEDARBAUM: And if you were to now
19 turn back to the second page of the exhibit,
20 there's a line four lines up from the bottom
21 labeled "Probability." Do you see that?

22 A I do.

23 Q And those are probability values that
24 Dr. Mariam used to test for normality of forward
25 gas prices?

0631

1 A I don't know if Dr. Mariam used them or
2 not. He didn't refer to them.

3 Q That's what they are. They are
4 probability values testing normality of forward
5 gas price data.

6 A I haven't been able to find the
7 documentation that explains what those are, but
8 they are, in fact, probability values for the
9 Jarqu-Bera test, yes.

10 Q And if you look at -- again, I'm on the
11 second page of the exhibit. The forward prices
12 quoted for May, for the dates in May before that
13 we discussed through July that we discussed. All
14 but the month of October show values of less than
15 5 percent; is that right?

16 A In the probability row, yes.

17 Q Right. And does that mean that at a
18 confidence level of 95 percent for the months

19 where the value is less than 5 percent, does that
20 mean that that confidence level of 95 percent,
21 there's a less than 5 percent chance of
22 occurrence that the data -- excuse me. Let me
23 restate that.

24 At a confidence level of 95 percent where
25 a value of less than 5 percent appears, that

0632

1 means at most there's a 5 percent chance of
2 rejecting the hypothesis that one is testing?

3 A I don't know. That was pretty garbled to
4 me. I would say it differently; that these
5 passed the normality test, except October, at the
6 95 percent confidence level. In other words, you
7 would not reject normality for these forward
8 prices for these rate year months in all but in
9 one case.

10 Q Is it correct that a result with less than
11 a 5 percent chance of occurrence means that the
12 data is not normally distributed?

13 A It would depend on how you set up the
14 test.

15 Q Under what circumstances would my
16 statement be true?

17 A Well if we set up an acceptance region for
18 a statistical test, we could be looking at one
19 tail or another. There's a whole variety of
20 things that we could be doing here. Part of the
21 problem I had in my understanding of this chart
22 in the beginning was the word probability didn't
23 trigger in my mind a specific result or test.

24 I can now reinterpret these statistics for
25 you in a different way. But at the time when I

0633

1 was writing about this, I misinterpreted these
2 results because there was no documentation I
3 could find about them.

4 Q Well, let me ask you, then, maybe to cut
5 to the chase here. This morning you deleted
6 a portion of your testimony on page 22?

7 A Yes, I did.

8 Q Why don't you explain why that happened?

9 A Well, as I just said, one of the things
10 that I did in preparing rebuttal testimony was to
11 study the workpapers of Dr. Mariam. And while
12 Dr. Mariam had not referred to these workpapers,
13 I discovered them and I looked at them.

14 And I looked in particular at the
15 Jarque-Bera test, and I misinterpreted the
16 significance of the results. I looked for
17 documentation within the Excel program for this
18 particular test, and didn't find it.

19 The word probability in that row is
20 nonstandard in statistics. And without further
21 research I couldn't really tell what these
22 statistics were doing. And, in fact, I just
23 guessed wrong, and was flat out wrong about it.

24 When I later had a chance to find the literature
25 on this particular test, the Jarque-Bera test,
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1 and read the paper by Jarqu and Bera, I found
2 this was a fairly nonstandard test for normality
3 because of certain restrictions in the test.

4 But nevertheless -- and I had my inference
5 from it backwards, so that's why I deleted the
6 question and answer.

7 Q When you say you discovered this, you mean
8 you walked into your office and there it was?

9 A I am sorry?

10 Q You say you discovered these workpapers.
11 They were provided to you in response to a Data
12 Request, weren't they?

13 A Well, sure. But lots of workpapers were
14 provided in the response to Data Requests. And I
15 pored through all of them and came across these.

16 MS. DODGE: Could I just object to the
17 prior question? I think it misstated Dr. Dubin's
18 prior answer on what he discovered.

19 Q BY MR. CEDARBAUM: I thought you said that
20 you discovered these workpapers?

21 A I thought I discovered my error that I
22 made.

23 Q I misheard you.

24 JUDGE MOSS: I think the record is now
25 clear.

0635

1 MR. CEDARBAUM: Your Honor I would offer
2 Exhibit 129.

3 JUDGE MOSS: No objection. Those will be
4 admitted.

5 (EXHIBIT 129 RECEIVED.)

6 MR. CEDARBAUM: Those are all of my
7 questions. Thank you.

8 JUDGE MOSS: Let's go around the room,
9 then. Mr. ffitch, do you still have questions
10 for Dr. Dubin?

11 MR. FFITCH: No questions for Dr. Dubin.
12 Thank you, Your Honor.

13 JUDGE MOSS: That will bring us to Mr. Van
14 Cleve.

15 MR. VAN CLEVE: We have no questions,
16 either, Your Honor.

17 JUDGE MOSS: Does the bench have questions
18 for Dr. Dubin?

19 CHAIRWOMAN SHOWALTER: I think my problem
20 is I am not sure I grasp enough of the fine
21 points to know what questions to ask, and I will
22 probably have to study the testimony more.

23

24

25

0636

1 EXAMINATION

2

3 BY CHAIRWOMAN SHOWALTER:

4 Q One issue here seems to be, all things --
5 all other things being equal, your position seems
6 to be more data, more years, is better than
7 fewer. Am I right so far?

8 A That's pretty close. It depends on the
9 issue we're talking about. With respect to
10 water, for instance, my analysis was a 40-page
11 detailed statistical analysis of hydro conditions
12 in the Pacific Northwest.

13 And I concluded that based on the
14 geological properties and the statistical
15 properties of those series, the best way to form
16 a long-term average was use all the available
17 information. In fact, I would say as a
18 statistician, it's always appropriate to use all
19 the available information.

20 However, you have to contrast that with
21 gas, and we have two polar opposites here. In
22 the gas situation, we're talking about
23 forecasting what is going to happen in the rate
24 year. And there's an issue about how far back
25 one should go to look at information. When you

0637

1 have a forward market at your disposal, a forward
2 market that is not too thinly traded and where
3 there's evidence of efficiency, then it's
4 appropriate to look at the most current
5 information, because it's not stale.

6 It's like predicting the presidential
7 election. The survey done three years ago about
8 whether Bush would win was not as interesting as
9 the one done before, the week before the
10 election. So in some cases you should use the
11 complete historical record. In other cases, when
12 you have an active futures market, as you are
13 making a forecast you should use the most recent
14 information because other information that you
15 could bring into play becomes stale, and is not
16 interesting, and actually will introduce bias
17 into a forecast.

18 Q So in the case of hydro conditions we're
19 dealing with a natural phenomenon, and there is
20 no market, I suppose, or potentially forecasts
21 about future hydro conditions depending on the
22 jet stream, or something like that. But in
23 general, you are saying that's a natural
24 phenomenon as distinct from an artificial or
25 financial phenomenon for which there is actually

0638

1 data in the future?

2 A We -- yes. There's not an active, that I
3 know of, futures market that's forecasting what
4 water conditions are going to be. That doesn't
5 mean one couldn't have one. In fact, futures
6 markets have been set up to forecast the election
7 because as soon as money is on the line, the

8 financial interest and the invisible hand
9 phenomenon comes into play. And when money is on
10 the line the forecast or implicit forecast become
11 quite good.

12 But there's no futures market developed
13 for hydro. And all the studies that I have read
14 in hydrology, and all of the various arcane
15 fields that deal with water, suggest that there's
16 limited ability to forecast the weather. Maybe
17 we can do it through satellite looking two or
18 three days in a row, or I can tell you it's
19 always going to rain here.

20 But more generally you need a long
21 geological record to know or to make a forecast
22 for weather. Water is going to be in the future,
23 and the best you can say about it is the long-run
24 average will tell you where you are going to be.
25 And maybe the little tiny bit of information on

0639

1 what happened last year, but that's about it.

2 With respect to the gas, however, I'm not
3 really interested in what the market was saying
4 two years ago, four years ago, about the future
5 spot prices. I am most interested in what is
6 going to happen, what information I have today,
7 and how those futures markets are trading with
8 respect to the near term future.

9 Because the market participants are
10 revising that information constantly, and putting
11 in their best information about where future gas
12 prices are going to be. So it is the difference
13 exactly between a financial market, a derivative
14 market, a market derived from economic forces and
15 one derived from geology.

16 Q Well, one question on the geology that is
17 probably a lay-type of question is, what about
18 global warming? That is, if it were true, and I
19 doubt there's evidence in this record that it is
20 or isn't, but then would you then want to take a
21 more recent set of years, done -- the full set of
22 years that you might have at your disposal, or
23 are we talking about geological time that is way
24 longer than 60 years anyway?

25 A That's a very good question, and perhaps

0640

1 we should get a geologist to speak to it. But my
2 understanding in reading this literature is
3 science is pretty unclear about weather
4 phenomenon, and whether we're in certain types of
5 cycles. And it's very difficult to say, absent a
6 very long geological record, whether something
7 that appears to be happening in the short term
8 is, in fact, a longer term trend.

9 So with respect to global warming, I think
10 the evidence really isn't complete yet. So we
11 just don't know.

12 Q So for purposes of this proceeding on

13 hydro conditions, you are back to just saying
14 more years is better, basically?

15 A Well, I am back to saying that there was
16 never any reason to exclude a period from 1928 to
17 1948 because those periods of time were
18 abnormally low.

19 And what I am saying in this proceeding
20 and in my testimony, and I think while you may
21 think it deserves further study, I think I can
22 put it to you quite simply: it's my opinion that
23 there were some failings in the original analysis
24 by Public Counsel's witness. And based on the
25 failings and those analyses, the Commission at

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1 the time adopted a 40-year water rule, which I
2 think is a disastrously bad rule.

3 And there's absolutely no reason that a
4 60-year record cannot be employed to make a
5 forecast of water. And specifically the reason
6 is looking at earlier water years, the '28 to
7 '48, period is very good geological evidence of
8 something that has occurred, and may occur again,
9 and may be occurring right now.

10 And as I wrote in my testimony, there's no
11 reason to look at this as an outlier, or to
12 conclude that it's an outlier and therefore
13 delete it. It's part of what happened in nature,
14 and we should give it some weight and some
15 credence.

16 The worst case scenario is the geological
17 record says one-third of the time that we have
18 seen we were in a period of dry years, and
19 two-thirds of the time we were in a period of
20 wetter years. If you combine that, you get the
21 average, the 60-year average, which is the
22 average I'm advocating to the Commission to
23 adopt.

24 I think it's an error to adopt a 40-year
25 rolling average, or any sort of rolling average.

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1 And the reason for that is a technical one, but
2 it's my understanding that Public Counsel's
3 witness at the time examined the hydrological
4 record and began a series of missteps that led to
5 a bad outcome.

6 And the first misstep in that process was
7 to say there's a lot of noise in this series.
8 What I am going to do is apply a five-year
9 average, moving average to that data to smooth
10 it. And when I first saw that I was kind of
11 dumbfounded, because that was a mistake that we
12 teach our graduate students over and over not to
13 make.

14 It was a mistake that was pointed out by a
15 famous Russian statistician, Slutsky -- I will
16 spell it for you later. And this statistician
17 observed -- and I brought some articles about the

18 point. He observed that if you take a completely
19 random series like water, and do a moving average
20 to it, you will produce a cycle in the data that
21 is not really there.

22 And the consequences of that was that
23 Public Counsel's witness, in examining that water
24 record, applied a moving average process to that
25 data, therefore introducing cycles that were

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1 never present in the first place. And as a
2 consequence of that went on to say, well, now in
3 the presence of cycles, we should use a 40-year
4 moving average.

5 It was a series in my opinion, of missteps
6 that led the Commission at the time to, based on
7 the evidence that it had, adopt a rule that is
8 needlessly -- not needlessly, but a bad rule and
9 one that is going to produce a series of bad
10 outcomes from this and other companies in the
11 future.

12 Q Now, moving to the financial side, it
13 seems almost contradictory to our discussion on
14 the natural side. But when I think about the
15 energy crisis, the Western Energy Crisis, it's
16 very clear -- I think it's becoming increasingly
17 clear that there were some highly unusual
18 situations that were going on.

19 Now, of course, that can repeat itself in

20 the future. But that was somewhat of an
21 artificially induced situation. And I am trying
22 to figure out how that should or shouldn't play
23 into our thinking. Do we -- is that like the
24 presidential election two times ago, and it's
25 really not an issue any more? We simply look

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1 forward.

2 A Well, there is an issue there. And the
3 issue is one that Mr. Cedarbaum raised with me,
4 which is the question about if you look at the
5 historical relationships between futures prices
6 and spot prices, and you look for quote outliers,
7 an outlier in a statistical setting is a point in
8 time or an observation that is completely
9 different than anything else that you see.

10 If you look at the statistical analysis
11 and ask the question of the statistics are there
12 outliers in the data, which is something that I
13 did, there were two data points that were
14 outliers in the analysis period, I believe it was
15 December of 2000 to January of 2001, at a time
16 when spot prices went through the roof. Only two
17 data points.

18 Now, Mr. Cedarbaum alluded to the fact
19 that one procedure for dealing with that is to

20 remove those data points. Another procedure is

21 to, like I said before, think about what caused
22 that and ask the question, should they be left in
23 or should they not be left in.

24 Staff had also sort of pointed me in this
25 direction by asking me to do a series of analyses
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1 to remove a much broader period of time in the
2 middle. I discovered two outliers, but Staff
3 asked me to take out maybe a 10-month period. I
4 can't recall.

5 And I did two sensitivity analyses with my
6 statistical work. One sensitivity I did was to
7 remove the two outliers that I discovered,
8 December of 2000 to January 2001, where those
9 spot prices were extraordinarily high. And the
10 answer was, in terms of my exhibits was that the
11 numbers changed a little bit. The key
12 coefficients and T statistics at R squareds, and
13 all the other things I referred to in the
14 testimony changed a little bit. But the broad
15 conclusions I reached were exactly the same about
16 the prediction of forward prices.

17 And, also, when I removed the period of
18 time that Staff had indicated in their Data
19 Request might be something to look at, I removed
20 those 10 months. And I found, again -- and I
21 prepared those tables and brought them with me if
22 the Commission would like to see them -- they
23 look exactly like the exhibit material to my
24 rebuttal report. They are exactly the same
25 format.

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1 One removes two points in time because of
2 outliers. And the other removes the period of
3 time that Staff indicated in their Data Request.
4 And, again, I concluded that the models fit
5 almost exactly the same way with the 10-month
6 period deleted.

7 Q What 10-month period is that, so we know?

8 A Yes. I can get that for you. Staff had
9 asked kind of pointedly to do some tests around
10 the period without June of 2000 through April
11 2001.

12 Now, mind you, I had discovered -- and
13 I will use the word "discovered" again. I
14 discovered through my statistical analysis that
15 there were two outlier points in time, and I
16 previously removed them to do a sensitivity.
17 Those were December of 2000 and January of 2001.

18 Staff had asked, why don't you do a test,
19 something called a chow (ph) test to remove a
20 longer period of time. And, again, when I did
21 that test, I produced almost identical results.
22 I mean, coefficients and T statistics, things
23 were minorly different than my broad conclusions
24 about how long an averaging period to use, the
25 efficiencies of the market, whether or not

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1 Dr. Mariam had done a correct analysis, none of
2 that changed as a result of excluding either that
3 entire period of time, or those two observations.

4 Q All right. Now, I don't quite understand
5 the use of the term "efficiency" here. I
6 understand if there's a liquid or illiquid
7 market, that is, I think the more liquid the
8 market you have, the more it can be relied upon
9 for making predictions about it. But where does
10 the term and concept "efficiency" come in?

11 A Well, I am glad you asked. Give me a
12 chance to tell you a little bit about efficiency.
13 Market efficiency is the one of the key results
14 in economics and finance. It's the proposition
15 that the prices are set using the full available
16 information in the marketplace; that in a world
17 of perfect knowledge prices reflect everything
18 that traders know, and all the information that
19 is possible to be known at that time.

20 Now, we know the world isn't quite that
21 perfect, but it goes to the old joke about the
22 economist walking down the street, looking down
23 and seeing a \$20 bill, and he didn't pick it up,
24 because the economist believes that if it was
25 really a \$20 bill, it wouldn't be there. Those

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1 rents, those arbitrage possibilities would be
2 gone.

3 Now, markets are not perfectly efficient.
4 And economists have come up with ways to test
5 efficiency. Efficiency in this context means, do
6 the futures market provide an unbiased predictor
7 of the spot market in the future?

8 So what is the future market? It's a
9 transaction today about a transaction in the
10 future. It's a contract we enter into at a price
11 that will prevail some time period into the
12 future. And the question is, when the future
13 actually comes up, were we correct on average?
14 Did we hit it on average?

15 And economists have actually tested market
16 efficiency in this literature, and in other
17 literatures. It started with the literature of
18 the agricultural products that we know have
19 active futures markets, grains and corns and cows
20 and cattle, and those sorts of things.

21 But economists have also looked for market
22 efficiency in the energy futures market. And you
23 are absolutely right. Markets that have very few
24 trades, which we call thin markets, don't reflect
25 a lot of information. But markets in which

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1 there's a lot of active trading, and I can
2 discuss that more if you like, do reflect
3 efficiency.

4 Now, what I did in response to the Data

5 Request that Mr. Cedarbaum had asked me about was
6 I had read the paper by Mazighi called the
7 Efficiency of Natural Gas Futures Markets that
8 was published in a journal I never heard of

9 called the OPEC Journal, but I still had never
10 heard of it. But I also collected other articles
11 and read a lot of literature and refreshed myself
12 on the literature, including papers cited by
13 Dr. Mariam.

14 And Dr. Mariam's citations were quite
15 helpful in this regard because he cited papers,
16 but -- I am going to give you a bunch of names
17 that we will go through later -- Guttomsen, Chinn
18 LeBlanc, Herbert, Bopp & Lady, Crowder, Mazighi,
19 Brenner and Kroner, and a paper by Peroni that I
20 found myself.

21 And it took awhile to sift through this
22 literature, because the literature was a little
23 bifurcated. Some economists were finding that
24 the market was efficient for futures in the gas
25 market, which would say that you could use the

0650

1 futures market to make a good forecast of gas
2 prices into the future.

3 Many others were saying it wasn't. The
4 paper cited by Dr. Mariam, for instance, said
5 that the market was not efficient. But one thing
6 that I learned in reading all the papers that
7 were cited by Dr. Mariam, not just this
8 particular paper, and some of the other papers,
9 was that there was a big intellectual
10 breakthrough in the early '90s.

11 And the intellectual breakthrough was that
12 previous studies had made mistakes statistically,
13 and there was only emerging one correct way to
14 test for efficiency. And a whole lot of studies
15 had done it right, and a whole lot had done it
16 right. I don't know if it's a coincidence. I
17 don't think it's a coincidence. But the paper I
18 cited about the market, a paper by Walls (ph),
19 was one of the papers that had done the test
20 correctly.

21 The articles by Brenner and Kroner and
22 Peroni explained how previous studies had it
23 wrong, and did the wrong econometric test. The
24 paper I cited happened to do it right. And, in
25 fact, what I learned was that all the papers that

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1 adopted the more recent econometric methods for
2 doing tests that fixed the previous problems, the
3 noninformative tests, had concluded efficiency.
4 And all the papers like Mazighi, which used
5 deprecated techniques and made erroneous
6 assumptions about stationarity and other
7 technical things, had it wrong.

8 Q Is there consensus now about what is the

9 right methodology, or is this your opinion that
10 this group did it right, and another group did it
11 wrong?

12 A No. I believe the consensus is emerging,
13 and the consensus is found in the paper cited by
14 Dr. Mariam. Those papers, if you read them
15 straight through from one end to the other, they
16 are technical arguments, but they repeatedly
17 explain that the older papers, not necessarily
18 all the older papers, but many of the papers that
19 got the technology wrong were getting the wrong
20 answer.

21 In fact, some papers even went so far as
22 to say we would expect that in using the
23 deprecated econometric techniques that authors
24 would conclude a lack of market efficiency when,
25 in fact, it's present. And that's exactly the

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1 trap the Mazighi in the journal I never heard of
2 came through.

3 Q So to get back to my level of
4 understanding, what I hear you saying is that in
5 your view, and you think in the view of others
6 who are respected, that there is, in fact, a
7 tight correlation or a useful correlation between
8 forward prices and later spot market prices -- I
9 am just trying to get to my question.

10 A I am sorry. I jumped on you. Go ahead.
11 I am very sorry.

12 Q But what pops into my mind is the Western
13 Energy Crisis, when I am very aware from our
14 direct experience that the forward prices were
15 going through the roof, and then various events
16 occurred, FERC actions and others things, that
17 dropped the spot prices.

18 And I am wondering how that figures in.
19 Is that sort of anomalous period that can be
20 counted or cannot be counted, but isn't really
21 what matters in the future, or was there still
22 some kind of correlation? How do I fit forward
23 prices during the Western Energy Crisis to
24 subsequent spot market prices that were quite a
25 bit lower, I believe?

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1 A Well, the evidence seems to find that
2 despite the run-up in prices, that what investors
3 were looking at -- what investors were seeing
4 when the markets were sort of in disarray was
5 more of a temporary phenomenon. And looking into
6 the future stability was deemed to reign once
7 again. At least that's how the statistics seemed
8 to be playing out.

9 Q In other words, that the forward prices
10 themselves anticipated a more stable future?

11 A I think that's the case.

12 Q And what about now?

13 A Well, I have seen no evidence in this

14 later period, including today, that says we're in
15 an inefficient period. For instance, the data
16 seems to suggest that the markets are bearing
17 good cohesion for the future.

18 Q And one last question on this. If the
19 market is efficient, does it mean that the
20 forward prices were, in fact -- in fact
21 accurately predicted spot prices later, or that
22 there's a correlation of whatever the forward
23 prices happen to be, and some other set of spot
24 market prices that correlate?

25 A Right. Well, we're going to make a

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1 prediction about the future, and we're not going
2 to get it right, but -- we're not going to get it
3 100 percent right on the penny.

4 What efficiency in this context means is
5 we want to be on average correct. We don't want
6 any bias. We don't want to be systematically one
7 direction or the other, and that's the conclusion
8 in this particular marketplace. We're on average
9 correct, and that's the best we can hope for. We
10 don't have a crystal ball about the future, but
11 we can be on average correct.

12 And the data analysis that Dr. Mariam had
13 done, the data analysis that I had done, both
14 found that kind of not only correlation, but also
15 an unbiasedness.

16 Now, what I talk about in my testimony is
17 when you start to forecast farther and farther
18 into the future, things become murkier. That
19 shouldn't be too surprising. But there's a
20 phenomenon in this particular market that
21 requires that there be further adjustment for
22 risks as we're going farther and farther into the
23 future, and the econometric results seem to
24 support that in a very nice way.

25 JUDGE MOSS: Let's take our morning

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1 recess, and come back at a quarter before the
2 hour.

3 (Brief recess.)

4 JUDGE MOSS: Back on the record. And I
5 believe Chairwoman Showalter had completed --

6 CHAIRWOMAN SHOWALTER: No, I haven't.

7 Q BY CHAIRWOMAN SHOWALTER: On the question
8 of using forward prices, is this correct that the
9 Company has proposed using a three-month set of
10 data of forward prices; is that correct? Just
11 answer "yes" or "no."

12 A Yes.

13 Q And is it also correct that the Staff has
14 proposed using a three-month set of data, but
15 it's a different three months?

16 A They have. Staff has proposed forming
17 three-month averages over almost a full year, and
18 then taking an average of all of those, but

19 excluding some later months of the year. So it's
20 a different procedure.

21 Q And I guess my question is, if there's a
22 difference in result of those two methodologies,
23 doesn't it suggest either that you need -- that
24 more, a longer time period is better, or that for
25 some reason, and you could tell me what it is,

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1 the Company's three-month period is a better
2 three-month period or somehow more accurate than
3 a longer set of data?

4 A There's a couple of issues there. As I
5 understand what Dr. Mariam did was he did some
6 analysis, regression analysis, and came to a
7 conclusion that averaging periods up to two
8 months would be appropriate. At least, that's
9 what I seem to believe is supported by his
10 regression analysis, and that's what it says in
11 his testimony.

12 He then formed three-month averaging
13 periods for a longer period of time, many
14 three-month averaging periods. And then took an
15 average of all of those.

16 Now, the rationale behind that, as best I
17 can tell, is Dr. Mariam said we're in a position
18 now where we're quite a number of months away
19 from the rate year. So to compensate for being
20 seven months, or five months away from the rate
21 year, I'm going to go backwards in time seven
22 months and take an average of all of three-month
23 periods, which come I think are appropriate. I
24 know it's confusing --

25 Q Why wouldn't you take an average of the

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1 last eight, nine, 10 months? In other words, I
2 realize this isn't your calculation, but I will
3 ask you the question.

4 If you were interested in a longer span of
5 data, why wouldn't one simply take the average of
6 all of them, 10 months divided by 10, or 12
7 months divided by 12?

8 A I think it's quite curious, actually,
9 because the one thing we learned from the
10 statistical results, and the one thing Dr. Mariam
11 had said is the more recent information is the
12 best information for the futures market. And his
13 statistics seem to point to -- his analysis,
14 which I think he has some technical problems,
15 seems to point to a two-month averaging period.

16 Now, I think it's not quite logical to
17 compensate for being farther away from the rate
18 year to go backwards in time. On top of that, by
19 forming a simple average of a bunch of
20 three-month averages, when you unwind all of
21 that, by which I mean you kind of write down
22 what, in fact, that does, it produces a very
23 funny looking average.

24 And I could draw you a picture with my
25 fingers, but there won't be a record of it. What
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1 it does is it tends to give very little weight in
2 the beginning time to the forward prices from,
3 let's say, December of 2003, and then more weight
4 in the middle to prices, and less weight in the
5 end. So, in fact, the calculations that
6 Dr. Mariam ends up doing, which I think had
7 reasonable grounds, I think there was a rationale
8 behind it, in fact ends up producing a funny
9 average which incorporates a lot of stale
10 information, I think.

11 And to go back to our polling example,
12 your question is why not take an average going
13 farther and farther back. And the answer is when
14 markets are efficient to nearly efficient, the
15 right answer is to take the most current
16 information, not information from before.

17 Q All right. So are you saying that if
18 there is an efficient market, then the sample you
19 want is the most recent time period, that is also
20 robust enough -- if that is the right word -- to
21 constitute a sample?

22 A I would think that is a good way to say
23 it. You don't want too few observations. And I
24 did some analysis of what too few observations of
25 contracts were traded, the illiquidity issue is
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1 all about, but you don't want to have too few.

2 But I think the answer Dr. Mariam reached
3 is a reasonable one, and I think the Company has
4 adopted that position as well, that a three-month
5 average has a certain virtue to it. It's not too
6 short or too long.

7 If it were longer it would incorporate
8 stale information, and the longer we go back, the
9 more additional adjustment up we need in the
10 forecastd price. Three months, on the other
11 hand, is a good compromise. And both the Company
12 and Dr. Mariam reached the position that three
13 months is a good average.

14 It's in the implementation that Dr. Mariam
15 slipped a little bit where he excluded some
16 periods toward the end of the year where prices
17 were higher. And then to compensate from being
18 farther away from the rate year, he went back
19 farther in time. And I don't think that's quite
20 logical.

21 Q So is it your view, then, that the best
22 data is the most recent three-month period
23 available?

24 A In the context in which we're speaking, I
25 think that would be my conclusion, that the most
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1 recent three-month information that we have is
2 going to be a good way to form a going forward

3 basis, a prediction or forecast of spot prices in
4 the future.

5 Q Is there any variation that is seasonal?
6 For example, that people buy up their year's
7 supply in the fall, and so the fall months might
8 be more reliable than April, May, June. And I am
9 not assuming any of those are facts, I am
10 positing it as a question.

11 A It's been asserted, and the markets in
12 futures prices, like the markets in spot prices,
13 will reveal some seasonality. The real question
14 is how far off is the futures price as a
15 predictor of the spot price, and does that have
16 any seasonality to it?

17 In fact, one of the papers that was cited
18 by Dr. Mariam, one of the papers that Dr. Mariam
19 cited referred to another paper in the literature
20 by Bopp & Lady, in Energy Economics, 1990.

21 And that paper -- the title of the paper
22 was A Comparison of Petroleum Futures Versus Spot
23 Prices As Predictors Of Prices In The Future.
24 And this was a paper cited by one of the authors
25 that Dr. Mariam cited.

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1 And this paper said that futures prices
2 anticipate the seasonal patterns and spot prices.
3 And that's exactly the statistical conclusion I
4 reached as well. Even though there's seasonality
5 in the prices, and one could see some
6 seasonality, that the difference between the
7 futures and the spot doesn't reveal any residual
8 seasonality to it.

9 CHAIRWOMAN SHOWALTER: Thank you.

10

11 EXAMINATION

12

13 BY COMMISSIONER HEMSTAD:

14 Q If 60 years is a desirable time period for
15 you, in other words, longer is better than
16 shorter, then why don't we use longer still, and
17 go back with data for all of the 20th Century?

18 A Well, there's two answers to that. One is
19 that such data doesn't exist; that there is a
20 good geological record for water in this region
21 that goes back 60 years, at least for the
22 Mid-Columbia River.

23 Prior to that, I don't believe there is an
24 existent record. So there is the issue there
25 about whether or not the BPA and the various

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1 authorities have been able to process the
2 geological information going back farther in
3 time.

4 The second answer is that there is more
5 data available than 60 years. In fact, I
6 analyzed 70 years, because I was able to look at

7 a more recent 10 years of information. So the
8 answer to your question is I would use all the
9 information that is available.

10 I was able to pick up more information
11 more recently, another 10 years, and analyze 70
12 years of water. And my conclusions about 70
13 years were no different than 60; that the period
14 of time was a very normal period that did not
15 reflect trends. It did not reflect significant
16 outliers. It was a stationary period.

17 And interestingly, these are exactly the
18 same conclusions that Dr. Mariam reached when he
19 analyzed the same information.

20 Q Why didn't you use 70?

21 A I did, sir. I relied on 70 in my analysis
22 for water. But there's an extra step for
23 generation, where there are further adjustments
24 that have to be made to the water to turn natural
25 flow into regulated flow, and those are complex.

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1 And apparently the powers that be haven't
2 reached a conclusion about the sanctity of the
3 70-year information at this time. But from a
4 statistical point of view, the 70-year water
5 average confirms everything I concluded about 60.

6 Q If one is concerned about the issue of,
7 over time, changing conditions, why wouldn't a
8 rolling average that randomly drops one year and
9 adds another year, whatever length or period of
10 time -- why wouldn't that lead to the same
11 result? For example, if you used a rolling
12 60-year average?

13 A Well, the first issue is that whatever
14 kind of average that we adopt should be the
15 result of a conclusion from a statistical study.
16 We shouldn't just pick it at random. We
17 shouldn't just decide that a four-year average is
18 the right thing to do, or a 60-year average. We
19 should conclude it from the information.

20 And the information at hand supports a
21 long-run average, not grouping any beginning
22 periods or dropping any ending periods.

23 That's the first point. The second point
24 is the technical point that I referred to by this
25 familiar economist, Slutsky, born in 1880 and

0664

1 died in '48 -- and I will read you from this
2 piece of paper, it says, "The famous Slutsky Yule
3 Theorum" --

4 Q It's not so famous to me.

5 A Well, it really is to economists. And
6 I will explain what it says again. He says, "The
7 famous Slutsky Yule Theorum, which is that the
8 moving average, an average you are talking about,
9 of a random series, like water, may generate
10 oscillatory movement when no oscillations exist
11 in the original data was laid out by Slutsky in

12 1927."

13 So what happens when you talk about --
14 it's not really randomly dropping a year and
15 adding one at the end. It's purposely dropping
16 one and adding another one, is that by forming
17 moving averages, you actually create something
18 that has correlation, because every average that
19 you form has a little bit of the old information.

20 So even though water could be random to
21 begin with, by the time you apply a moving
22 average to it, you produce a pattern to it.
23 Slutsky noticed this, and roundly criticized the
24 Nobel winning economist who had studied data by
25 forming averages.

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1 And we teach this to our students, that

2 one of the steps you don't want to do is form a
3 rolling or moving average unless there's a
4 compelling reason to do it. And in this
5 instance, I don't think there's anything that
6 compels such an outcome.

7 Q With regard to the gas futures issue,
8 ultimately I am surprised at what seems to be a
9 significant difference in the end price. Again,
10 the Company's position is -- correct me if I am
11 wrong here -- is the \$5.60 price, and the Staff
12 is \$4.69. Is that your understanding?

13 A As I said to Mr. Cedarbaum, I don't
14 remember the exact figures, but I will take your
15 word for those.

16 Q I don't recall, either. But anyway, a
17 measurable difference in the two positions. In
18 forming a quite generalized overview, having
19 listened to this discussion and perused your
20 testimony, how would you characterize the nature
21 of that difference as relating to technique as
22 against timing?

23 A No. I think the answer is completely a
24 consequence of what is happening in the market
25 today. And I think one way to look at that is to

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1 ask what has happened to forward prices since the
2 rebuttal testimony has been filed. In other
3 words, what has been happening since the Company
4 put in a number, as of, I think it was ending in
5 September. What has happened more recently?

6 And as I understand it, forward prices or
7 futures prices have continued to increase,
8 peaking even further, and then they have gone
9 back down to levels that are more similar to the
10 three-month average that the Company had formed.

11 Q I was about to say, my impression is that
12 the forward prices have been falling.

13 A More recently they have, and back down to
14 the level, I believe, that is more similar to the
15 three-month average formed at the time the

16 Company made the latest revision.

17 Q Well, if you were to apply your analysis
18 as of today, say as of last Friday, what would be
19 the consequence or your estimate of how that
20 would change your conclusion about the forward
21 price?

22 A Well, I'm going to throw in a subject to
23 check, but I'm told by Puget's people that if you
24 were to do that analysis, which I haven't done,
25 but it's a simple matter of looking up the most

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1 current rates and Ms. Ryan can do it in her
2 testimony, and perhaps if she does do it, someone
3 else can bring this information to you. But my
4 understanding is even the forward prices continue
5 to rise and peak.

6 Now, when you form a three-month average
7 using the most current data, we're back down to a
8 number that is very similar to what the Company
9 had put in their latest revision.

10 Q And back to my earlier question, this
11 issue of timing versus technique, I take it from
12 your answer that the primary driver of the
13 difference is timing?

14 A Well, I guess I would phrase it slightly
15 differently, because I'm not sure if we're
16 talking about the same kind of timing.

17 Technique is the least important aspect in
18 the sense we're not talking about a very
19 disparate methodology. The Company originally
20 had looked at a 10-day period, 10-day average in
21 forming the most recent 10 days of information
22 that they had. That probably, in retrospect, was
23 a little on the thin side.

24 Dr. Mariam did a very useful starting
25 analysis. He analyzed the question of the

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1 relationship between averages of various lengths
2 and future spot prices, and reached the
3 conclusion that I don't particularly disagree
4 with, that three months has some virtue to it.
5 It's not too short, because that would give you
6 too few transactions. On the other hand, it's
7 not too long where you pick up stale information.

8 So we're not at a technique point in time.
9 So you are left with a timing question. And
10 timing to me means we're trying to make a
11 forecast about the future, and it's actually this
12 point in the near future. And you either trust
13 the markets where people have money on the line
14 and are making decisions every day about what is
15 going to happen in the near term, or you don't.

16 And what I can tell you is that an
17 efficient market, and the closer you get to the
18 end the more efficient things become -- an
19 efficient market is one where the information is
20 reflected, and on average you are correct.

21 And so what the market is telling you
22 right now is that gas prices in the near term, in
23 the rate year, are going to be higher than Staff
24 maybe believes, according to their analysis.

25 That's what the consequence of looking at
0669

1 the forward markets today, or even at the time
2 the Company put in the number is.

3 COMMISSIONER HEMSTAD: Thank you. That's
4 all I have.

5 EXAMINATION

6
7 BY COMMISSIONER OSHIE:

8 Q Dr. Dubin, I want to ask a follow-up, I
9 suppose, on questions that were asked about
10 the -- by both Commissioner Hemstad and the
11 Chair, Madame Showalter.

12 The issue that I would like to discuss is
13 how your analysis of the average water years took
14 into consideration the differential, if you will,
15 if it exists, between river basins on the west
16 side of Washington, that being the Baker River
17 system and the Snoqualmie River system. And you
18 are talking about the Columbia system, and they
19 are not connected in any way.

20 And the generation from the west side is
21 significant. I mean it's roughly 20 plus percent
22 of the total hydro generation that is purchased
23 from the Columbia PUDs. So how did you take into
24 consideration the differences between the basins,
25 if any exists, in your analysis?

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1 All I have heard so far and what I read is
2 that you were looking at end streamflows within
3 the Columbia River basin. I didn't read anything
4 in your testimony, that I can recall, about your
5 analysis of end streamflows in the Baker River or
6 Snoqualmie, or others in western Washington, and
7 whether that would have any effect on your final
8 opinion, your conclusion.

9 A Well, it may be just a lack of clarity in
10 my presentation, but I think I could find it in
11 my testimony. But I did separate the ownership
12 of generation interests from plants on the
13 Mid-Columbia from those the Company has on the
14 other system.

15 Q Did you do the same analysis on the Baker
16 River system as you did for the Columbia, looking
17 at historical end streamflows and calculating
18 what the average generation may be from that
19 system?

20 A Well, at some point I combined the two.
21 But I looked at the relationship between
22 generation on one river with respect to the flow
23 on the river separately. And then at some point
24 I combined them.

25 And I also, at some point, did a

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1 statistical analysis of a longer 70-year period
2 for the Grand Coulee flows, and separated that
3 analysis in my workpapers, at least from the
4 generation and water flows on the other rivers.
5 The Company has the ability to track water levels
6 and water flows on both rivers, and I was able to
7 keep that separate.

8 COMMISSIONER OSHIE: Thank you. No other
9 questions.

10 JUDGE MOSS: I have a couple of clarifying
11 questions.

12

13

EXAMINATION

14

15 BY JUDGE MOSS:

16 Q Both in your oral testimony and in your
17 written testimony I understand that there are
18 points of agreement and points of disagreement as
19 between you and Dr. Mariam. And indeed, for
20 example, on page five of your direct testimony,
21 you stated at the conclusion of the early
22 discussion of the hydro matter that "Dr. Mariam's
23 position with respect to the statistical use of
24 water flows, and the use of data for forecasting
25 is, for all intents and purposes, the same as

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1 mine."

2 And there are another statements, but what
3 I want to get to is what will no doubt be
4 abundantly clear on brief, but is it the result
5 of your analysis that you believe that Staff is
6 overstating hydro generation in its analysis of
7 power costs, or understating it, or getting it
8 just about right? What are the differences in
9 practical outcome?

10 A This is page 5 of my rebuttal testimony.
11 But to answer your question, let me characterize
12 it in this fashion. Dr. Mariam did his own
13 independent analysis of water flows and
14 generation separate from mine. And he reached
15 the same statistical conclusions as I did.

16 So now we have got at least the two of us,
17 and possibly a third from a professor at the
18 University of Washington, who is not here to
19 testify, who has looked at this in a deep
20 statistical way, and concluded that water is
21 stationary. It's normal, it's trendless, it's
22 not forecastable very far into the future.

23 Where Dr. Mariam differs is on a
24 nonstatistical point. What Dr. Mariam says is
25 that -- he says the last 10 years that I analyzed

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1 of water, and of generation has not been
2 processed in the way the Northwest Power Pool, or
3 whoever the appropriate authority does it, in a
4 way that everyone has agreed on.

5 So he says that because of the run-off
6 curves and things I don't quite understand, that
7 there's a 10-year period at the end which he
8 would recommend not adopting. But he says, "But
9 I have got no reason to exclude anything in the
10 beginning. And in fact, 50 years of the 60 years
11 that Dr. Dubin looked at is fine."

12 So I would say to you that on a
13 statistical grounds, at least, you should use all
14 the data that is available. And I don't think
15 Dr. Mariam disagrees on statistical grounds. He
16 finds fault with using a more recent 10-year
17 period. And the Company has basically, in
18 a point of compromise, said, "Okay. We will go
19 with that. We will adopt the 50 year, too, if
20 that's the best we can do."

21 I happen to believe the difference would
22 be marginal, and one should look at the 60-year
23 period, because the adjustments that are being
24 discussed are out in the minutia. But I can't
25 swear to that. It's my belief in talking to

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1 Company people about what the adjustments are,
2 but I'm not in a position to testify to that
3 issue.

4 Q Okay. You have answered my question.
5 Thank you.

6 The other question I have -- and I
7 apologize for my earlier miscitation. I'm in
8 your rebuttal testimony, and I am looking at page
9 16. And we had some earlier discussion about the
10 question and answer at the top of that page
11 concerning the differences between the Staff
12 samples, I guess, I will say, that were
13 studied -- that you studied as opposed to
14 Dr. Mariam. And so you studied a longer period,
15 as I understand it, nine years more information.

16 My question is simply, are you implying
17 here that Dr. Mariam's -- is "sample" the right
18 word? Sample or data?

19 A Whenever you don't use all of the data,
20 you can call it a sample.

21 Q Are you implying that Dr. Mariam's sample
22 was inadequate for purposes of this type of
23 analysis? I'm not sure what to make out of this.

24 A Well, the answer to that is yes, to some
25 degree. It's always better to use more

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1 information. And I think that Dr. Mariam, in
2 fact, had more information at his disposal.

3 At least according to my review of his
4 workpapers, he had information going back at
5 least to 1999, and chose not to use it. At least
6 that's my understanding in following through his
7 work.

8 I see no reason not to go all the way
9 back. His futures Nymex market has been studied

10 by many researchers going back to 1990, and the
11 relationship between futures and spot prices is a
12 subject for analysis, using all of that
13 information.

14 Now, in terms of adequacy of the period of
15 time that Dr. Mariam employed, I'm not saying
16 that shorter period biases his answers or
17 anything like that.

18 What I am pointing out, though, is
19 Dr. Mariam analyzed a question that was not
20 exactly, I think, germane to the proceeding in
21 the sense that he asked whether looking into the
22 immediate future, let's say we're one month away
23 from the rate year, how much averaging should we
24 do going back? Should we go back one month, two
25 months, three months when we're going to look one

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1 month into the future? That's the question he
2 asked statistically.

3 And the question I thought was relevant
4 was the question that, in the world we live in,
5 is when you are sitting in a rate case two years
6 away from the rate year, or at the present time
7 when we're on average about eleven months away,
8 or we're about five months from the beginning
9 now, and 17 months, whatever it is, you want to
10 look at historical examples of what the
11 relationship of futures and spot prices were when
12 you were forecasting much farther away in time.

13 And I'm note sure that Dr. Mariam analyzed
14 the short period of time because he used a
15 shorter data set. But I will tell you if you
16 want to look at the relevant question of
17 forecasting far into the future, you need a lot
18 more data going back, because otherwise you run
19 out of that information.

20 You don't have enough examples of cases
21 where you are two years, or 17 months away from
22 the forecast. If you are looking at a very short
23 period of time, you can ask the question what
24 happens when you are only one month away from the
25 rate year? But do we really care? That's a good

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1 question.

2 It's a question that has been analyzed in
3 the literature when economists have tested
4 efficiency. That's not a world we're in today.
5 We are in a world where we have to forecast
6 farther into the future, and that requires a
7 longer data set.

8 Q Can I take from that, then, that looking
9 at the three months, the recent three months of
10 data for purposes of considering what the price
11 might be 12 months hence is not particularly
12 going to yield particularly reliable results? As
13 I understand what you are saying, it would yield
14 reliable -- fairly reliable results for the next

15 month, but maybe 12 months out not so?

16 A Well, I analyzed that question. The
17 Company asked me to analyze the question. They
18 asked me to analyze how are we doing forecasting
19 five months into the future by using this
20 technique? How are we doing forecasting 17
21 months into the future, which is the end of the
22 rate year period? And in future cases what kind
23 of shape will we be in when we have to forecast
24 two years into the future?

25 And the answer was that there was good

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1 cohesion in the markets, good correlations, even
2 when you were looking two years into the future.
3 So the answer about the most recent three-month
4 period is it would probably provide a pretty good
5 forecast for looking five to 11 to 17 months,
6 maybe even two years into the future.

7 So I'm not that worried about this
8 three-month average for future months forecasts.
9 That's what the statistical results showed.

10 JUDGE MOSS: Any follow up?

11

12 FURTHER EXAMINATION

13

14 BY CHAIRWOMAN SHOWALTER:

15 Q As a result of some of the questions and
16 answers up here, it occurred to me that we might
17 want a bench request of the most recent three
18 months that -- under your methodology.

19 But then I am a little confused by the
20 question and answer just now. I would have asked
21 for it on the basis that I thought your answer to
22 me was, well, yes if we're going to look at
23 what's the most accurate forecast for the rate
24 year, we would do best to take the most recent
25 reasonable time period, which I am going to

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1 assume it's three months. So we should get the
2 most recent three months.

3 Then I was a little unclear, maybe because
4 I wasn't listening fully, as to what this last
5 exchange was about. But in your opinion, if we
6 get the most recent three months, is that a
7 better three months than the other sets in this
8 record?

9 A Here's the confusion. I think if you look
10 at the most recent three months, it has activity
11 in it which pertains to the rate year, number
12 one. That activity is going to be a good
13 indicator of what is going to happen in the rate
14 year. No question.

15 It also has other activity in it, the most
16 recent three months, where traders are looking a
17 year or two into the future. Not the rate year,
18 but a year or two into the future. That may be

19 interesting for people who are thinking about gas
20 prices a year or two into the future, but it's
21 not the rate year.

22 And I believe Your Honor was asking about
23 how good is this three-month information about
24 forecasting two years into the future. I'm not
25 sure that is as important to us as -- excuse me,
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1 how good the three months is for forecasting the
2 rate year, which I think is pretty good.

3 Q Well, we can ask for other things at
4 different times, but we would like to have that.

5 A It's possible Ms. Ryan has that all ready
6 to go, the updated three-month average.

7 JUDGE MOSS: That will be bench request
8 seven.

9 (BENCH REQUEST NO. 7.)

10 JUDGE MOSS: When do you think we might be
11 able to have that, Ms. Dodge? If you can consult
12 with your client.

13 MS. DODGE: We could have it tomorrow
14 morning.

15 JUDGE MOSS: Excellent. Thank you.

16 COMMISSIONER OSHIE: Judge Moss, I have a
17 question.

18

19 FURTHER EXAMINATION

20

21 BY COMMISSIONER OSHIE:

22 Q That's what happens when you have a lot of
23 time in between. But I want to go back to the
24 question that Commissioner Hemstad asked you,
25 because it deals with the period in which you
0681

1 looked at hydrological information to come up
2 with your conclusion.

3 But recently, more recently than the last
4 five years or so, if I'm not mistaken, there have
5 been studies done by the University of Washington
6 looking at paleogeologic information data that
7 looked at the end streamflows of the Columbia
8 River basin back to 1858.

9 I'm not sure how they derived that
10 starting date for the period, but I would assume
11 the information gets a lot stronger and gets to
12 be harder, if you will, as you approach year
13 period of 1928.

14 And I understood your answer that you
15 thought the information was just too soft to go
16 back any farther, and especially particularly
17 back to the 1860s, 1870s. But there's certainly
18 information that was compiled before the planning
19 stages of Grand Coulee.

20 So assuming that, I guess I want to go
21 back, then, to your answer that there were
22 certain calculations that were made that -- so

23 even though the information might be soft, you
24 then made calculations as to what the available
25 generation would be.

0682

1 And I don't have any idea what that
2 calculation would look like, but you go back to
3 1928 -- I'm trying to figure out why 1928, when
4 there is no hydroelectric projects on the
5 Columbia River. So you would have to apply
6 whatever calculations you made to river
7 conditions at that time to derive some type of
8 average of million acres feet average, and then
9 combine it with your calculations to determine
10 generation.

11 So there's certain -- I guess my question,
12 going back -- you can go back to 1928, look at
13 that when there are no hydro generation
14 facilities on the river. Why can't you go back
15 to 1920 or 1918, or 1900? Or is it just a
16 function that you think the information is too
17 soft on which to base some analysis? And if so,
18 doesn't it form your final conclusion?

19 A Well, first of all, I myself did not do
20 the generation estimation. That's done by the
21 Company and the Company's consultants.

22 But I think the answer to your question is
23 the Army Corps of Engineers, who are the people
24 who measure for the government the flows, may not
25 have been meshing flows back before 1928.

0683

1 All I can tell you, and maybe I'm wrong
2 about this -- and if I am, I will be happy to
3 amend my answer -- but my understanding is there
4 is no water information for these rivers before
5 1928.

6 Now, with respect to the paleogeographic
7 information, if we're talking about tree rings,
8 or how much dinosaurs were growing, I think there
9 is some useful information there, and that
10 information does not -- millions of acres feet of
11 water measured in a standardized way.

12 I think you are correct that water on the
13 Columbia River in the '20s, when there were no
14 projects yet sited, receives the least
15 adjustments. Because as we go forward in the
16 current situation, we have to sort of take out
17 the siting of projects and the use of water, go
18 back to a natural water state, which is one
19 estimation. And then we apply the current
20 regulatory rules to that water to get some
21 information about what the world would have
22 looked like in flow and generation in 1928 had
23 the plants been there in 1928.

24 Those are complicated calculations. But I
25 think the fundamental problem is a lack of

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1 measurement in a consistent way before 1928.

2 Again, if I am wrong about that, my standard
3 operating procedure in a project like this is to
4 get everything. And I remember going to the Army
5 Corps of Engineer's website and looking, and
6 looking backwards in time. I know there were
7 some rivers in this area that have water flow
8 measurements that go back farther that are not
9 geologically hydrologically associated with the
10 Mid-Columbia or the Baker area.

11 But my understanding is there's no
12 measurements that go back before 1928. And if
13 there were, I would say let's look at them and
14 let's adopt them. But it's not because I made a
15 determination that the 1927 data was squishy or
16 soft, or not useable. It was just not there.

17 COMMISSIONER OSHIE: Are you waiting for
18 me? No more questions.

19 JUDGE MOSS: Yes. I should have looked.
20 Any follow-up, Mr. Cedarbaum?

21 MR. CEDARBAUM: I did have a couple of
22 questions.

23

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1 RE CROSS EXAMINATION

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3

BY MR. CEDARBAUM:

4 Q Dr. Dubin, on the issue of the outliers
5 you indicated that you removed two data points in
6 your analysis during the period of time that was
7 covered by the Western Power Crisis. I think
8 that was your testimony. Can you just specify
9 what those two data points were? Were they days?
10 You refer to December and January of that winter.
11 But I'm assuming you meant days in those months?

12 A Well, actually, by the time the
13 statistical analysis was done, both Dr. Mariam
14 and I were focused on months. We were looking at
15 average spot prices in a month, and we were also
16 looking at average futures prices pertaining to
17 that month.

18 So we made the decision independently to
19 examine periods of times that were months in
20 length on average. So I actually removed two
21 months. Now, the statistics show those two
22 months were, quote, outliers, so I did not focus
23 on days.

24 Q And what were the gas prices that you
25 removed for those two months?

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1

A You want numbers?

2

Q Yes.

3

A I don't recall. I mean, I remember graphs
4 of Dr. Mariam that had very, very enormous spikes
5 in them, but I don't recall exactly how tall the
6 spikes were.

7 Q You don't recall a range of the prices?
8 A They were really big. I mean, they were
9 much different than the rest of the data. But
10 without looking at an exhibit, I couldn't tell
11 you.

12 Q What information would you be looking at
13 to find those numbers?

14 A Dr. Mariam has presented some graphical
15 analysis, I believe, which covers that period of
16 time. And I know that the same material appears
17 in one of my book chapters in a recent book I
18 wrote about the California Energy Crisis.

19 I was looking at that, and I saw the same
20 run-up in prices. I just didn't bring the book,
21 and I don't recall what the numbers were.

22 MR. CEDARBAUM: Thank you. That's all.

23 MR. FFITCH: Your Honor, given the wide
24 ranging nature of the discussion this morning,
25 and the reference to Public Counsel's witnesses

0687

1 -- or witness, I would like to ask a couple of
2 follow-up questions, if I may.

3 JUDGE MOSS: All right.

4

5 RE CROSS EXAMINATION

6

7 BY MR. FFITCH:

8 Q Good morning, Dr. Dubin. I'm Simon
9 ffitich, from the Public Counsel office.

10 First of all, following up on the
11 questions that Commissioner Oshie just asked
12 about historical water information, were you
13 aware that in the 1984 Washington Water Power
14 Company case that the Commission was presented
15 with a 105-year study of the Columbia River
16 drainage at The Dalles, Oregon?

17 A Yes.

18 Q But you didn't discuss that in your
19 testimony?

20 A I think no, I didn't, because I thought
21 the Commission's ruling on that made some sense.
22 I think the Commission ruled that that area was
23 hydrologically disassociated from the area of
24 interest of the Company.

25 And even though it was a longer record, it

0688

1 wasn't a germane record. I think the Commission
2 got it right on that one.

3 Q You didn't discuss that, the 105-year
4 study that was available for the entire Columbia
5 River drainage in your testimony in this case?

6 A No, I didn't.

7 Q And you didn't even refer to it in your
8 answer to Commissioner Oshie with regard to what
9 kind of water information is available, did you?

10 A Well, I thought we were talking about,
11 with all respect, kind of relevant water. And I

12 didn't think that was relevant based on what the
13 Commission had said at the time.

14 Q Now, you were referring earlier to your
15 critique of Public Counsel's witness and
16 testimony in the last Puget Sound case, UE
17 921262, correct?

18 A I don't remember the case citation, but
19 I will assume that that is correct.

20 Q And that citation is found in your own
21 testimony.

22 A Okay. Then I will assume it's correct.

23 Q And that is the last Puget Sound general
24 rate case, correct?

25 A Yes.

0689

1 Q Do you know who the Staff witness was in
2 that case?

3 A I believe it was Dr. Blackman -- Staff
4 witness, I think he was Public Counsel's witness.
5 I don't know the Staff witness. Did you ask
6 Staff or public?

7 Q I asked Staff. Do you know who the Staff
8 witness was in that case?

9 A I think it might have been Mr. Wintergaard
10 (ph.), but I don't recall.

11 MR. FFITCH: Can I approach the witness,
12 Your Honor?

13 JUDGE MOSS: For what purpose?

14 MR. FFITCH: To show him a copy of the
15 order in that case.

16 (Discussion on the bench.)

17 MR. FFITCH: Your Honor, I am handing the
18 witness a copy of the Eleventh Supplemental Order
19 in docket UE 921262, the last Puget Sound general
20 rate case that you were just discussing.

21 JUDGE MOSS: Let me make sure the record
22 is clear. That is not the most recent Puget
23 Sound rate case. When you say it's the last
24 case, I'm not sure what you are saying.

25 MR. FFITCH: I stand corrected. The last

0690

1 fully litigated general rate case that went to
2 hearing. I realize we have had an intervening
3 case that was settled in 2002.

4 MS. DODGE: And a merger in between.

5 JUDGE MOSS: I think we're clear now.

6 Q BY MR. FFITCH: I would like you to read
7 the paragraph on page 43, at the top of the page.

8 MS. DODGE: That's actually a lengthy
9 paragraph, and perhaps Mr. ffitich could
10 paraphrase or ask a question rather than having
11 him --

12 JUDGE MOSS: Let's don't have the
13 witness -- you can cite it and discuss it in your
14 brief without having the witness read it into the
15 record. If you have a question about the
16 paragraph or about the proceeding or the order,

17 that's fine.

18 MR. FFITCH: Your Honor, the witness has
19 been on the stand for three hours. This will
20 take probably one minute, and I think will shed
21 some light on the discussion, and then I might
22 have a follow-up question or two.

23 CHAIRWOMAN SHOWALTER: Can't you
24 distribute a copy of that page to all of us, and
25 then we can read it, and then ask a question

0691

1 about it? It's very hard to listen to long
2 paragraphs read, and we will get more out of it
3 if we see it.

4 MR. FFITCH: Thank you, Your Honor.

5 Q BY MR. FFITCH: Dr. Dubin, have you read
6 the Commission's eleventh supplemental record in
7 docket UE 921261?

8 A Is that the document you just showed me?

9 Q Correct.

10 A I glanced at it a second ago. I think I
11 have read that, yes. It's not in front of me
12 now.

13 Q And would you accept that the Commission's
14 decision in that case was based upon the
15 acceptance of the Commission Staff's position
16 with regard to the 40-year rolling average for
17 water?

18 A I would actually like to see the document
19 again. And it sounds like it calls for a legal
20 conclusion. I don't know, but I will do the best
21 I can if you let me see it. (Reading document.)
22 "Commission accepts the Commission Staff's
23 position."

24 Q So do you now accept my question -- the
25 answer is "yes" to my question?

0692

1 A I mean, it says what it says.

2 Q Have you reviewed the testimony of the
3 Staff witness or witnesses in that proceeding?

4 A Yes.

5 Q And did you discuss that in your testimony
6 as you discussed the testimony of the Public
7 Counsel witness?

8 A No, I didn't.

9 Q Are you aware that in that docket -- are
10 you aware of what the Company proposal was in
11 that docket with regard to this issue?

12 A I believe the Company advocated a
13 cumulative averaging using all available data,
14 but I'm fuzzy on that.

15 Q How is that different than your
16 recommendation here, or is it essentially the
17 same recommendation, the use of all available
18 data on a cumulative rather than a rolling basis?

19 A I think it's the same position. I mean, I
20 would like to see again that particular witness's

21 analysis to be sure of what the Company was
22 advocating. But I recall it being a cumulative
23 average, which in my terminology would be a
24 average that would be available to use.

25 Q And the Slutsky Yule Theorum that you
0693

1 mentioned in your testimony was announced in
2 1927, and significantly in advance of this
3 proceeding, the 1992 proceeding?

4 A Yes.

5 Q Dr. Dubin, it's my understanding from your
6 testimony, and correct me if I am wrong, that the
7 impact of your recommendation that the Commission
8 abandon its 40-year rolling average treatment of
9 the water issue results in an increase in the
10 Company revenue requirement of \$11 million; isn't
11 that correct?

12 A That's the Company's estimate, yes.

13 Q And my last question -- just give me a
14 moment. Can you just state the total amount of
15 your billings to Puget Sound Energy for your
16 testimony in this case through October?

17 A For my testimony, you mean, sitting here
18 today?

19 Q No. I mean the entire amount of billings
20 from your firm for your testimony in this
21 proceeding on the hydro issues.

22 A And you wanted that through November or
23 through October?

24 Q If you have it through November, that
25 would be preferable.

0694

1 A Yes. I can tell you the work that was
2 done on hydro that began in March of 2004 came to
3 about \$124,000, according to my assistant -- and
4 as you say, subject to check -- my assistant's
5 pulling of the figures.

6 And the gas analysis, which began in
7 October, was maybe \$87,000 through November.

8 Q BY MR. FFITCH: Okay. Thank you. I don't
9 have any further questions, Your Honor.

10 JUDGE MOSS: Is there any redirect?
11

12 REDIRECT EXAMINATION
13

14 BY MS. DODGE:

15 Q Just briefly, Dr. Dubin, you discussed in
16 response to some questions from Commissioner
17 Oshie how one takes into account the fact that we
18 have had developments in the Columbia River
19 system, including dams and various things that
20 mean that you have to adjust observed flows back
21 to -- I may get the terms wrong -- back to
22 natural flows.

23 And I wanted to ask, were those
24 adjustments something you did, or were they done
25 by others?

0695

1 A I think, as I recall -- let me just check
2 my testimony on this. But, yes, it's the
3 Northwest Power Pool that makes those
4 adjustments. I say this at page 7 of my
5 testimony, "Approximately every ten years the
6 Northwest Power Pool estimates the water flow
7 that would have been existent absent the siting
8 of dams or any water restrictions on the water."
9 That gets to natural flow. And then at
10 that point rule curves and more recent regulation
11 has to be applied, and that's a function that the
12 Company does -- or maybe not the Company, but the
13 Northwest Power Pool does through
14 Mr. Chillengarian.
15 MS. DODGE: That's all.
16 JUDGE MOSS: All right. It appears,
17 Dr. Dubin, that we have had all the questions
18 that we will have. And we appreciate your being
19 here to give your testimony. You may step down.
20 THE WITNESS: Thank you, sir.