BRITISH COLUMBIA UTILITIES COMMISSION

IN THE MATTER OF THE UTILITIES COMMISSION ACT
S.B.C. 1996, CHAPTER 473

and

British Columbia Hydro and Power Authority
Call for Tenders for Capacity on Vancouver Island
Review of Electricity Purchase Agreement

Vancouver, B.C.
January 28, 2005

PROCEEDINGS AT HEARING

BEFORE:

R. Hobbs, **Chairperson**

L. Boychuk, **Commissioner**

VOLUME 15

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CAARS

VANCOUVER, B.C.

January 28th, 2005

(PROCEEDINGS RESUMED AT 8:30 A.M.)

THE CHAIRPERSON: Please be seated.

I think we will begin this morning's proceedings with Mr. Weisberg's motion.

MR. SANDERSON: Mr. Chairman, before you call people to speak to that motion, it might be efficient for me to indicate what Hydro's position will be. I'm not going to argue, but just indicate what the position will be, because I think it makes the motion simpler.

Mr. Weisberg asked for two things yesterday as I understood him. One, and this is at transcript 3022, one was Calpine Island's Co-generation Project bid, including the price information form that was submitted in response to the VICFT.

That can be dealt with, I think, quite straightforwardly. Ms. Van Ruyven at page 1132 of the transcript testified at lines 4 through 11 -- I'll just start at line 5 -- as follows:

> "…we had no reason to exercise the privative clause to even look at other projects, and Calpine's project was a non-compliant bid, and therefore we would not be able to look at it…"

Proceeding Time 8:30 a.m. T02

So the first thing is that there's evidence that Hydro never looked at the bid. I'm advised, and if it's necessary I'll submit an affidavit from Hydro, that not only did they not look at it, they sent it back. And so there is not an order that the Commission can make to B.C. Hydro which will produce that bid, because B.C. Hydro doesn't have it.

The second request from Mr. Weisberg was that Appendix 3 of Epcor Power Development Corporations peaker project bid in the VICFT be produced. Well, with respect to that, I can't say anything about Epcor, but I can say that I think at the heart of Mr. Weisberg's request is argument he may wish to make about inferences the Commission can draw or knowledge the Commission may have with respect to who the 47 megawatt peaker at Ladysmith was.

With respect to that peaker, I can say, and I think the record is clear -- I don't have references for this because I think it's throughout the record; that peaker was considered as one of the -- within one of the Tier 1 portfolios. It was -- you'll recall, there was a 299 megawatt portfolio which comprised the peaker and one of the LNG proposals. So that was fully evaluated in the Tier 1 proposal, which means that all of it was within the QEM. All of the QEM

data has been filed in confidence with the Commission already.

So unless Mr. Weisberg knows something that neither I nor my client could discern over night, there isn't any information that is being sought there, insofar as it relates to a peaker, which hasn't already been filed, and as I say, consistently I've declined to say whether or not that is in fact Epcor, but Mr. Weisberg can argue about that. The information that is available in the QEM has already been filed.

THE CHAIRPERSON: Thank you. I think before I hear from anyone else, I will hear from you, Mr. Weisberg.

MR. WEISBERG: Well, with respect to the comments about Calpine's bid, Calpine's letter has been on the record since January 6th. Mr. Sanderson was aware at that point, presumably, on the instructions of his client, that B.C. Hydro didn't possess that information. That information could be known only to Hydro and presumably to Calpine if that's correct, but certainly not to Green Island. We had no way of knowing that unless we were so advised by B.C. Hydro as we were only today.

Proceeding Time 8:33 a.m. T3

Much of this motion addresses the prejudice that will result for Green Island as a hostage, if I

can use that term, to the process, because Green Island's project alone didn't aggregate sufficient megawatts to comprise a portfolio that would be considered under the rules. Had we been advised by B.C. Hydro, which they apparently knew all along that they didn't possess the Calpine bid, then perhaps things might have unfolded differently. But I'd suggest then, if that is the case, that B.C. Hydro doesn't have that information, that the application could be amended so that the order would provide leave to Calpine to forthwith provide their price information.

With respect to the --

THE CHAIRPERSON: Just a question of clarification.

MR. WEISBERG: Yes.

THE CHAIRPERSON: Are you suggesting that there be an order to Calpine for Calpine to file that information?

MR. WEISBERG: I am not suggesting it in those terms, Mr. Chairman. What I am suggesting is that the order could be phrased to provide leave to Calpine, so at their option, to file forthwith the price information for their bid. That would leave it in Calpine's discretion, and I believe that that in the interests of fairness is where the order should be directed. It would leave it to Calpine's discretion to comply with that or not. And given the position taken in their

January 6th letter, at this point I'd be surprised if they didn't comply with at least that opportunity created. And again I -- yes.

THE CHAIRPERSON: Is that very different than simply giving Calpine an opportunity to file that information now?

MR. WEISBERG: I'm sorry?

THE CHAIRPERSON: Is that very different than simply giving Calpine an opportunity to file that information now?

MR. WEISBERG: That's what I'm getting at. If the Commission makes clear that Calpine has that opportunity still at this stage to file it.

THE CHAIRPERSON: Okay.

Proceeding Time 8:36 a.m. T04

MR. WEISBERG: And I guess beyond that, what the Commission could -- that would be helpful in terms of phrasing the order at this point would be to make clear that the price information from Calpine is admissible and that if filed it would be accepted on a confidential basis for review only by the panel, and Commission Staff. And I would say that at Calpine's option -- I'm not going to take a position on this, but perhaps the option could be make for Calpine to agree that that could also be provided to B.C. Hydro in confidence.

With respect to the comments Mr. Sanderson made about the peaker, I think Epcor's letter is in express terms. Letters, I should say. They filed two. They've specifically identified the nature of their project, I believe.

Mr. Sanderson's point was that that information is already, I believe he said, embedded in the QEM. Just for the sake of clarity, of ease of evaluating that information, as B.C. Hydro has done already, but what we are asking the Commission to consider is evaluating that bid in the context of other portfolios which were not assembled under the QEM. So to facilitate that process as much as possible, I contend that it would assist the Commission Panel if that information was filed on it's own and the Commission Panel could determine how it wants to insert it into the QEM in whatever combinations it may see appropriate to do so.

There is no down side or prejudice that I can see from directing that filing. It's a small document. But I believe that the precision that it would afford to the Commission Panel in evaluating a broader range of options that what B.C. Hydro has done, necessitates its admission.

THE CHAIRPERSON: If it's already been admitted, aren't the balance of your comments going to argument?

MR. WEISBERG: I'm at the disadvantage of not knowing exactly what went to the Commission. I have Mr. Sanderson's characterization. I'll accept that on its face, but I don't know looking at -- I haven't seen the price information form for Epcor, I haven't seen how it fits into the QE model as presented to the Panel and I submit that the Commission Panel is also in the position I'm in the first respect, that you haven't seen the price information form, and it may be that it's easier for you to evaluate other portfolios if you have that document than if you don't.

Proceeding Time 8:40 a.m. T5

THE CHAIRPERSON: Well, we have the tender sheets that are a component of the QEM model, spreadsheets, and they provide -- I'm hesitating here a little bit, Mr. Sanderson, but --

MR. WEISBERG: I'm having difficulty hearing you.

THE CHAIRPERSON: Oh, sorry. The tender sheets provide the pricing information. I need B.C. Hydro to confirm this, but the pricing information that's set out in Appendix 3. And I'm also -- you have received a copy of the QEM model itself. I don't recall if that includes the proforma tender sheet or not, but if you have in your possession both of those documents, then you have, I think in its entirety, what we have, but populated. And so I think you're in a position

already, subject to confirming that you have the tender sheet proforma, you're in a position already to determine what information we have.

MR. WEISBERG: I think the essential point here, Mr. Chairman, is, is the price information form from Epcor itself the best available information for the Commission to consider?

THE CHAIRPERSON: Well, it's my expectation it's the only information that was provided to B.C. Hydro. I think B.C. Hydro probably at the end of the break needs to confirm what I've just said with respect to what's been made available to you, and that what we have is everything that they have with respect to that bid. But once that's confirmed, Mr. Weisberg, it seems to me that that precision is already there and the balance of your comments go to argument.

MR. WEISBERG: If Mr. Sanderson confirms that and you subsequently confirm what he's told you as confirming what you've just stated, then I suppose we're there.

THE CHAIRPERSON: Okay.

MR. WEISBERG: But I want to absolutely make sure that the Commission Panel has before it or it has available to it, the best possible and most accurate information regarding Epcor's price information contained in its bid.

THE CHAIRPERSON: And I think there are two questions for

you, Mr. Sanderson, whether or not the tender sheets have been made available in a proforma basis to the Intervenors that have signed the confidentiality form. And secondly, has the Commission received all of the bid information with respect to Epcor?

MR. SANDERSON: Mr. Chairman, I will, as you give me the opportunity to do, take the break to confirm the status of that. I may say that -- and when I do that, I'm going to have regard to two things in the context of Mr. Weisberg and his client, which is what the bidders -- sorry, what the parties to this proceeding were entitled to receive, but also what bidders were entitled to receive. I mean, I think the tender sheet proforma, almost without question, was provided to Green Island long since, because they were a bidder. Now I stand to be corrected, but I find it very difficult to conceive that in terms of the formatting and the nature of the information that Mr. Weisberg hasn't been informed of that, or his client hasn't, for a very long time.

With respect to second question I'll take instructions.

THE CHAIRPERSON: Okay, thank you.

MR. WEISBERG: Well, on Mr. Sanderson's concern, that wasn't the primary focus of my application. I think that was apparent. My primary concern is that that

information is before the Panel in the most successful form.

THE CHAIRPERSON: Right, which is the second question that Mr. Sanderson is going to get instructions on and we'll advise the Panel of.

MR. WEISBERG: Okay. One other comment regarding Calpine's bid. Mr. Sanderson said that in Hydro's estimation it was a non-compliant bid. Because of that the price information was never looked, and B.C. Hydro doesn't at this point have the bid.

Proceeding Time 8:45 a.m. T6

Whether or not it was non-compliant, we submit, is a live issue. It may be that the Commission Panel yet finds some validity in the argument that we'll make on that point. In that case, it would seem to take us back to the point in time when B.C. Hydro returned Calpine's bid and whether that was the proper thing to do or not. And the fact that it was returned to Calpine and is no longer available to B.C. Hydro is a consequence of that decision rightly or wrongly made. And I think that's an additional consideration that you need to address in this application.

THE CHAIRPERSON: Well, that bid may or may not have been compliant.

MR. WEISBERG: Yes.

THE CHAIRPERSON: But again, your motion, I understood it to be, very specific to information that you wanted us to direct B.C. Hydro make available to the Panel. And again, is there not a distinction here between the evidentiary record you're trying to establish and the argument that you would like to make? And in this context, if B.C. Hydro does not have that information, it seems to me that in order to them to make it available to us would be --

MR. WEISBERG: I'm sorry?

THE CHAIRPERSON: Is it not -- does it not follow that if B.C. Hydro doesn't have that information, that in order to them to provide it to us would be a hollow order?

MR. WEISBERG: What I'm suggesting, that the framework within which you consider the importance of B.C. Hydro's determination of whether it was compliant or not is in the context of deciding now if you will provide leave to Calpine, not B.C. Hydro, to file its price information at this point and take into the consideration the fact that perhaps it should have been before you, perhaps B.C. Hydro should at this point still have it, depending on whether or not they made the right decision on whether it was material or not.

So in response to the new information

presented by Mr. Sanderson, I have changed the first part of the order that I'm seeking, and I'm simply saying that the deemed non-compliance of the bid is a live issue, it is an issue that you should consider in determining whether you provide leave to Calpine to file that information at this point.

THE CHAIRPERSON: Well, Mr. Sanderson, what's your position with respect to Mr. Weisberg's request that should Calpine wish to file that information with us at this point, that it be admissible?

MR. SANDERSON: Mr. Chairman, it's not a subject on which I have obtained instructions, but let me say this. Mr. Weisberg completely, I think unfairly, characterizes what's happened with respect to the Calpine letter at a very fundamental level.

Calpine wrote on January 6th, it's true, and in it it said Calpine would not object to a Commission order directing Hydro to file confidentially with the Commission, Calpine Island's Co-generation Project including the price information that was submitted in response to VICFT. And Mr. Weisberg seemed to be trying to imply that that somehow put some onus on Hydro to do something, say something or whatever.

Well, Hydro did respond to that letter, and what Hydro said through me on January the 10th in writing, which is Exhibit B-39, was:

"We write in response to Calpine's letter of January 6th. Calpine has not intervened in this proceeding. While it is unclear whether Calpine is actually seeking any relief from the Commission, we point out that if it is, it must obtain standing in the process before it can expect to have any request it makes to treat it seriously. That not having occurred, we intend to provide no further response at this time."

Calpine and Mr. Weisberg have been on notice since then that B.C. Hydro's position was, if you want to come to this proceeding and have your opinions heard or lead evidence, then you become a party in it and you allow other parties to ask questions or take whatever other procedural steps that your being a party permits them to take.

Proceeding Time 8:50 a.m. T07

Mr. Weisberg has known that, and he as much as said yesterday that he's been trying to get Calpine and Epcor to come to this proceeding from the beginning. That was the clear implication of what he said yesterday. And he acknowledged that finally now that B.C. Hydro's rebuttal panel is up, all the evidence from Intervenors is in, he's despaired of succeeding.

I think that's probably wise, to despair of proceeding in that respect at this point, because we have gone on long enough, and I'm sure his considerable efforts notwithstanding, they appear not to want to come forward.

To give leave now or to give encouragement for them to come forward and reopen things, I think, from a procedural point of view, would be quite unfair and quite unnecessary. They've known, Mr. Weisberg's known what Hydro's position was and what they needed to do if they wanted to get this evidence in. They've chosen not to, for whatever reason. I don't know what that reason is, but I think it's far to late in the proceeding to start re-opening those issues.

MR. WEISBERG: Mr. Chairman, this is a classic case of sandbagging. Mr. Sanderson has just referred to his letter in response to the letter from Calpine. There's no mention in that letter that B.C. Hydro didn't have that information. They certainly could have stated that. They should have stated that. They did not. They took issue with whether Calpine had standing.

MR. SANDERSON: Mr. Chairman, I really do take exception to that. I just think that's outrageous, frankly. This letter says, Calpine, you're not a party and we're not responding to that.

We have absolutely clear testimony, we've had it from the very beginning, that B.C. Hydro didn't open the bid. No one's asked whether it was sent back. We've said we're not commenting on it. Last night Mr. Weisberg makes his extraordinary motion, which causes us -- causes me to get instructions. Now he doesn't like the answer.

To suggest that there's anything inappropriate in what Hydro did, I think is outrageous in that circumstance, quite frankly.

THE CHAIRPERSON: Mr. Sanderson, I wonder if there's anything on that record that in fact establishes that the process for B.C. Hydro under the CFT was to return non-compliant bids.

MR. SANDERSON: We looked quickly last night, to see whether there was anything on the record. I didn't find it quickly last night. I won't say there isn't, because -- but the passage that I read this morning comes close but doesn't say that definitively. It doesn't say they were returned. It says they were unopened.

I suspect that if one looks in the CFT documentation, which is what I haven't had an opportunity to do, there is very likely an obligation on Hydro to return it unopened, but I can't -- I don't know that, and that's the one area of inquiry that, if

it still matters, I would undertake, to look through the CFT rules and see whether there wasn't a rule that it had to go back if it was non-compliant.

THE CHAIRPERSON: Right, thank you.

MR. WEISBERG: Mr. Chairman, the other point you need to take notice of, is that in Calpine's letter, which put this issue in motion, it is clearly stated there that Calpine would have no objection to an order from the Commission to B.C. Hydro to provide that. It's a short letter, it's a simple letter. The intention is clear.

B.C. Hydro reading that letter had to assume that if the order was made it would be to B.C. Hydro, to provide that information. And their silence on a fact that's now material, is something you should consider.

THE CHAIRPERSON: I am going to reserve on this, Mr. Weisberg, but do you have any reason to believe --

MR. WEISBERG: I'm having difficulty hearing you again, sir.

THE CHAIRPERSON: Sorry. I'm not helping.

Mr. Weisberg, I'm going to reserve on this issue, but I would like to ask you at least one more question, and that is, do you have reason to believe that Calpine, if the Commission Panel determined that it would accept that evidence, do you have reason to

believe that Calpine will do that, and particularly in a timely way?

Proceeding Time 8:55 a.m. T8

MR. WEISBERG: My belief is this, sir. It's founded on Calpine's own letter, which says that they would not object to an order to B.C. Hydro to produce that information. I believe the expectation that they would, if given the opportunity now to provide that, knowing that the alternative is not possible, I believe it's entirely consistent with the intent that they have already expressed. And I think that rather than me speculating and trying to anticipate what position they take, we should look at what Calpine has said on the record in this proceeding, and that stated intention in the January 6th letter is consistent with an expectation that at this point, yes, they would file.

THE CHAIRPERSON: Yes. As you've mentioned during this proceeding, on November the 30th the Panel spoke to the issue of developers, and one might interpret what was said then to suggest to developers if they wish to participate that they should do so. And this is the last day of this proceeding.

I will reserve on this and we'll return to it when Mr. Sanderson is able to get instructions, whether that's after the morning break or after lunch

hour we will return to this. But before we do that, I'd like to give anyone else who is here this morning an opportunity to comment if they wish to.

MR. WALLACE: Thank you, Mr. Chairman.

Mr. Chairman, clearly -- and I'm going to speak to the Calpine issue. Clearly resource bias is one of the issues, and the facts around the non-compliance of Calpine are fairly clear, so that argument will be there. It seems to me that it may be of assistance to you to be able to go the second step based on confidential information, and know whether that was material or not. And the opportunity to see the Calpine bid on a confidential basis may assist you in doing that rather than to work in a vacuum.

Calpine hasn't come forward, nor have a lot of other bidders, and I think there can be a number of reasons and one can speculate on it, but they are going to be in future processes presumably, and they have ongoing relationships and the past is the past. So I think if you can get extra data that helps you say yes, maybe there was an issue here, and yes or no, it's not -- it's relevant, I think, or material, I think could be helpful. I think Calpine's letter is fairly clear that obviously they were prepared to cooperate with an order to B.C. Hydro.

I don't know that you need to order

Calpine. I think if you put a request to Calpine and gave them a fairly tight deadline, it's either done or it isn't and we go ahead, there's no contempt of an order or a failure to comply with an order. It's a request and it can be accepted or not.

I do think having the information would helpful, even on a confidential basis, and would hope you'll make that request. Thank you.

MR. BOIS: Mr. Chairman, I don't think I've been in a hearing that has been fraught with as many procedural applications and things as this one has, but nevertheless I rise to speak to a couple of things.

The evidence on this hearing from Norske is that they have a proposal that deals with a demand-side management portfolio, as part of a portfolio of solutions. And I don't think that Norske will say and will dispute that by itself it is not a solution. But as part of a package, it is a solution. And that information was confirmed by Mr. Mansour in his evidence where he said that this wouldn't be a long-term solution, but over a hump he could concede as part of a solution.

Proceeding Time 9:00 a.m. T09

We have the evidence of Green Island, which is uncontroverted and unchallenged by B.C. Hydro with respect to their evaluations of the portfolios that

they see as being more cost effective than the Duke Point project, ranging anywhere from 53 percent of the costs of this project to 68 percent of the project.

It seems to me, therefore, Mr. Chairman, that it's almost incumbent upon the Commission to seek this information to better assess and understand what's happening with respect to all of these developers bids. And I agree that the issue of the non-compliance of the Calpine bid is a life issue. I'm not necessarily stating what we will be taking a position on and how we will argue that, but I think it's still a very live issue and it has to be addressed one way or the other. I think the only way to do that is for you to see the information.

I am not going to go into the debates about whether B.C. Hydro should have retained the bid or not. I think it's clear that Calpine is saying that its information, if this Commission chose to look at that information, I think the letter is clear that it will not object to that, which suggests to me that it should -- it will provide that information whether B.C. Hydro is ordered to obtain it or not. And I think your concern of getting that information on a timely basis can be easily handled by you -- or by this Commission, by saying that it has to be provided by a date specific. And then you can make your

determinations and assessments.

I'm also troubled by the apparent departure from what we started with, which was the EPA as it stands, into a dialogue that seems to suggest the EPA with some modifications, or the Duke Point project with some modifications. And I'm not saying that that's not the best solution, but what we came to this hearing with was, B.C. Hydro's proposal of this EPA agreement as being the best solution. Through the course of this hearing we have learned that that is not the best solution and that is not the case.

We have also learned through the transcript release of the *In Camera* session that other issues have been brought to light in the Commission's mind with respect to the EPA and the whole CFT process. And that means -- and by that I mean, the references to distillate firing to deal with the potential risk of gas transportation issues. The issue of what appears to be a concern from Duke Point about the $50 million that they have to pay. Other issues were brought into that discussion beyond the duct firing issue, and it seems to me that we're now moving into a dialogue where again we're looking or seeking to possibly amend the EPA or issue an order that the EPA is rejected but there's direction and encouragement from the Commission that if you came back with these

additional clauses we'd approve it.

That seems to me to be outside the whole confines of the CFT process. That's akin --

MR. SANDERSON: Mr. Chairman, I'm sure we're going to hear more of this in argument, but I'm at a complete loss as to why I'm hearing it this morning. I've got a panel here. I would like to get on with their evidence. This doesn't seem to me, the speculation about what Hydro's position might be, to have anything to do with the very narrow question that Mr. Bois was asked to address.

MR. BOIS: Mr. Chairman, it goes to the broader issue that if you don't consider this evidence as being valid -- valid material for you to consider, then why are you considering or even entertaining discussion on these other points? It seems to me that if you're going to open the door to this box, you can't shut it selectively. It's either opened or it's not, and it was opened by B.C. Hydro in that *In Camera* session, and it seems to me therefore it should be open to everybody to walk through that door, including Green Island, including Calpine, including Epcor and whoever else wants to walk through that.

If B.C. Hydro doesn't like their QEM model results they shouldn't have come here with those results. It raises a lot of questions and it raises a

lot of questions about the assessments of how those portfolios were assessed. It seems to me that the only way to resolve those questions is to bring that evidence forward and have you look at it on a confidential basis.

The last thing I want to say is that the part of the evaluation and the model itself with respect to why it's a little bit concerning to me, is that B.C. Hydro made a number of assumptions about that portfolio model, and it didn't include assumptions with respect to the Calpine/Epcor bids. In fact, it's clearly stated it didn't include anything about the Calpine bid. To me that seems to be totally an incorrect position, assuming, of course, that the Calpine bid's non-compliance is not a material issue.

Proceeding Time 9:05 a.m. T10

If it is a material issue, then I support B.C. Hydro's position. They shouldn't accept the non-compliant bids. But if they're making determinations about a non-compliance bid and then turning around and saying, we'd rather have all of our druthers about these other things, then where do you draw the line of materiality? If it's not the solution they want, does that mean it's not material?

THE CHAIRPERSON: Mr. Bois, you're not arguing now?

MR. BOIS: Perhaps a little. I may be sending out a little bit of signals, but I think that -- my ultimate point is I think the motion has merit, Mr. Chairman. I think it's incumbent upon this Commission to consider that evidence and to alleviate all of the concerns and questions that have been raised by the motion and throughout this hearing. And I'll leave it at that, Mr. Chairman, thank you, unless you have some questions.

THE CHAIRPERSON: No.

MR. BOIS: You're not going to invite me to do that, eh?

THE CHAIRPERSON: I'm not. I will invite others, but please confine yourself to the issue, and that is whether or not the Commission Panel should either give leave to Calpine or simply indicate that it's willing to admit evidence from Calpine at this point in the proceeding.

MR. LEWIS: I will fully try to confine myself to that.

THE CHAIRPERSON: Thank you.

MR. LEWIS: I believe that this information goes directly to the heart of the principal issue. And I guess this discussion could be made completely irrelevant if, given the uncontroverted evidence of GIE is accepted as truth by the Panel.

Now, providing information and how it is assembled or evaluated are two completely different

matters. The fact that the Panel has it before it does not mean the manner in which it was evaluated could not be different. So when the dispatchability is determined and the value is given to an energy margin, it may be that a specific project within a portfolio will vary depending on the other projects that it's combined with in portfolios.

Now I hate to put something that I don't know the answer to, and there's probably people cringing behind me hearing that, but you know, where I am right now, I don't know the process enough to say, just because you have price information doesn't mean that it wasn't interpreted the exact same way.

Now, it might be that when combined with a larger somewhat of a base load plant, a 47 megawatt peaker may not be dispatched at all and therefore is not given any value in an energy margin, and therefore, you know, makes it less cost-effective. However, if combined with a smaller base load plant so it's dispatched more, and that gives it more validity within a portfolio or makes it more cost-effective, I don't have those answers but I believe that some of the uncontroverted evidence we've seen has shown that, and it has given drastic results that are a fraction of the cost of what's put forward. So if we are going to look at that, I think that's important.

Now I take you to page 1745 of Volume 8, the unredacted proceedings, lines 15 to 17. I'll give you a minute. And what Mr. Sanderson says there is:

> "…I'll say this in final argument, it ought to be doing, which is approving what is best amongst the opportunities that are now available."

If the Commission Panel has determined that it's going to venture abroad from the principal issue of is the EPA that's put forward the most cost-effective means to address our situation, then I don't think it's fair to now have B.C. Hydro narrowing what those opportunities are, and I don't think the Commission Panel should be looking to narrow those opportunities."

Now, I have further on this, but I'm not sure if I'm going into argument or if there's a separate larger issue here that's going to be dealt with at another time.

THE CHAIRPERSON: In argument. You will be given an opportunity to submit argument, Mr. Lewis.

MR. LEWIS: Thank you.

MR. QUAIL: Mr. Chairman, we've spent 40 minutes talking about whether a document is going to be admitted in confidence. If it is admitted, nobody else will see it other than the Commission. The Commission can look

at it, if it's useful use it, if it's not useful put at the bottom of a large heap of fairly useless documents in this proceeding. No, it would have been very -- just go ahead, let Calpine file it if they want to. You figure out whether to make use of it. In my submission we don't need all of this discussion on this subject.

Proceeding Time 9:10 a.m. T11

THE CHAIRPERSON: It sets the stage, Mr. Andrews.

MR. ANDREWS: It's not an auspicious starting point for my submissions, but nevertheless, my first point is that the Calpine letter to the Panel implied clearly that Calpine understood that B.C. Hydro still had Calpine's information; and secondly, that the B.C. Hydro letter back to Calpine and put on the public record did not disabuse this Panel and the parties of the impression that B.C. Hydro did have the Calpine information.

My submission is that it does not lie in B.C. Hydro mouth at this point to argue that the time is too late to deal with Mr. Weisberg's request, since Hydro could have provided information earlier on that would have clarified matters.

And the next point in terms of Hydro's argument that it would be unfair that this information be received because it would not be available for

cross-examination, two points. One is that Hydro hasn't said what exactly it would cross-examine on, and it really isn't clear that there would be anything that it could cross-examine on that would be relevant here; and secondly, that none of the confidential information submitted to the Panel so far has been the subject of cross-examination, certainly not by the Intervenors. And so from a fairness point of view, what's sauce for the goose is sauce for the B.C. Hydro gander.

Those are my submissions.

THE CHAIRPERSON: Thank you. Is there anyone else who -- Mr. Keough.

MR. KEOUGH: Mr. Chairman, I was on the borderline as to whether I would rise simply in response to the comments made by Mr. Weisberg, because I thought Mr. Sanderson had appropriately addressed those. However, in light of the piling on that has occurred since then, including the comments made particularly by Mr. Bois where he has sought to present you with his argument on a number of matters and I think mischaracterized something else, I feel I have no choice but to get up and make some comments.

What people seem to have forgotten here is fairness. And I've expressed a concern previously on this record regarding the Calpine letter. They are

not a party to these proceedings. They knew the process and they chose not to come here.

Now, we know why Mr. Weisberg needs them and his client needs them, and that's fine, and he can make what arguments he wants. But I think it would be pretty extraordinary that on the last day of a -- hopefully the last day of the evidentiary portion of a proceeding, for this Commission to somehow direct and order to a non-party -- and I don't care if the evidence is being submitted confidentially or if it's being plastered on the walls outside the building. That's not the point. The point is that would be rather extraordinary to say: What we're going to do at this point in time is invite a non-party who chose not to participate, who was encouraged, I'm sure, to participate, who filed a letter that is troublesome enough on the surface, now we're going to try to induce some information out of them and put it on the record at the last minute.

That to me is extraordinarily unfair, and I'm not sure that -- unless you invoke some extraordinary powers, that you are going to be able to do anything, you know, to a non-party who willingly chose not to be party. I suppose you could compel them to attend in some way, rather odd at this point. But I think it goes to the fairness of the process and

I think it would be ridiculous to suggest it will be anything but patently unfair at this point to extend this type of offer.

Proceeding Time 9:15 a.m. T12

Calpine knows the game. If they wanted to be here they would be here. If they wanted to complain about any unfairness in any part of the process, surely they had that opportunity to completely do so.

So I think you just have to look at this, step back it and look at it in terms of fairness, and that gives you your answer as to what you should do here, and that is to deny the motion. Thank you.

COMMISSIONER BOYCHUK: Mr. Keough, I have a question for you. If this information had been filed earlier in the proceeding -- I'm just trying to get to the unfairness. If it had been filed on a confidential basis as has been requested by parties, what would you or others have done with that information? What is the nature of the unfairness, aside from the fact it's the last day of the hearing and I fully appreciate that.

MR. KEOUGH: One thing is if it was filed by a party to the proceeding, we can all speculate on what their involvement in the proceeding would be, whether they would have to put up witnesses, whether I could have

cross-examined them, whether we could have tested any aspect of their case. The presumption that I'm not -- or I agree with is that they could have just put in that information and done nothing else. So I think the unfairness goes -- and we're just speculating because they're not here and they've never been here. But I mean, Green Island was here. We heard evidence from them. We had a chance to have discussions with them.

I mean, we're sort of saying Calpine could have been sort of the semi-participant, I suppose, and I just don't know what they would have done or how it would have been handled. But to speculate that I would have had no rights vis-à-vis Calpine had they chosen to be here, I think is just speculation, and that's the other aspect of the unfairness.

COMMISSIONER BOYCHUK: Okay, thank you.

MR. KEOUGH: Thank you.

THE CHAIRPERSON: Mr. Weisberg, you will get a chance to respond. I am going to reserve. My preference would be not to hear from you now, hear from B.C. Hydro first and then you get the right of reply.

Is there anyone who wishes -- Mr. Steeves?

MR. STEEVES: Good morning, Mr. Chairman. Chairman, I would just like to make a comment here, hearing the discussion going on about the issue with Calpine. And

I raise the issue with regards to comments by the representation for Duke Point, the issue of fairness.

In this regard I was considering this matter earlier, and I thought to myself, well, perhaps we really need to consult all the bidders on the CFT to consider a survey of the bidders, to ask them in a survey, formal survey, whether they were treated fairly both as an individual company to the bidding process, as well as a group in the tendering process, whether the tender was fair.

I tried to do something along this line. I petitioned B.C. Hydro requesting the e-mail addresses and official -- appropriate officials to the bidder process. However, they said this was confidential information and they declined my request for the appropriate data. And I bring this to your attention because talking with Penny at the Consumer Energy Consumers Association, she was saying that there should be a follow-up, an official survey done by an appropriate research company doing the exact same thing but should be in more detail, to determine whether this issue of fairness was actually there in the CFT. And I'm simply raising this to bring it to your attention and to make sure that the issue of fairness is properly treated.

Thank you.

THE CHAIRPERSON: Is there anyone else who wishes to speak now? Thank you.

Either after the morning break or after lunch, we will return to this issue subject to the instructions that Mr. Sanderson needs, and I think there are two issues with you, Mr. Sanderson, one with respect to Epcor, simply to confirm that all the bid information has been made available to the Panel, and then with respect to Calpine, whether or not there is anything in the CFT documents that called for you to return that bid.

Proceeding Time 9:20 a.m. T013

And I also of course will give you another opportunity to speak to the merits of the request with respect to Calpine, and perhaps the request with respect to Epcor and that will then take us to Mr. Weisberg's reply, and we can do that immediately after the morning break or after lunch, and I think that's at your election, Mr. Sanderson.

Now, Mr. Sanderson, before we move on to this panel, I did want to speak to argument, and I think this panel probably will have some interest in this.

I will identify it as the Panel's current thinking with respect to argument. I will entertain objections to it, and I think I'll entertain those

objections immediately after lunch.

The argument from B.C. Hydro, on this tentative schedule, would be due February the 1st at 4:30. So Tuesday. Argument from all of the other participants would be due on February the 4th at 4:30, and the reply would be due from B.C. Hydro on midnight on February the 7th.

The Panel has not yet determined whether or not there will be an oral phase of argument. If there is to be an oral phase of argument, the tentatively scheduled date is February the 10th, and by noon on February the 9th we would provide notice advising you that there is going to be an oral phase of argument, and then if there was we would proceed on February the 10th.

Are there any other preliminary matters before we do get on to this panel?

Hearing then, then I think we hear from Mr. Steeves now.

B.C. HYDRO REBUTTAL PANEL

FREDERICK PICKEL, Resumed:

RICHARD LAUCKHART, Resumed:

CHRIS O'RILEY, Resumed:

CROSS-EXAMINATION BY MR. STEEVES:

MR. STEEVES: Once again, hello, Mr. Chairman.

Mr. Chairman, I start off by -- I'd like to

address the witnesses. The documentation I have here is the appropriate documentation that the witnesses have submitted. It's a three-tab document, is this correct?

MR. SANDERSON: Yes, that's what they have.

MR. STEEVES: And this is the documentation I believe that is the documentation that the witnesses are responding to, and firstly I'd like to note that Mr. Sanderson has claimed that the documentation was available since Saturday, and a letter that accompanies this document is address as Tuesday, January 25th, which indicates that I'm not the only one that makes mistakes.

MR. SANDERSON: Mr. Chairman, I'm running out of patience, I have to say. This document was made available on the record, I told people Friday night, I told them Saturday morning it would be distributed. The decision to file it as rebuttal was made Tuesday, as everybody has heard, and I won't have the record show that Mr. Steeves didn't have a full opportunity to get access to this information Saturday morning.

MR. STEEVES: Well, all I can say is that I only had it the other night, so I'll leave it at that.

Now, I spent about two and a half hours late last night trying to go through this document, and Mr. Lauckhart gets off most of the hook because I

didn't even get a chance to really go through his material. Unfortunately Mr. O'Riley, he had the graph, so that made it easier, so I'm going for him.

MR. STEEVES: Q: On page 2 of this documentation, it states, "the workshop objectives, obtain approval for the use of alternative heat rate scenarios in price forecast processes."

Would you like to please explain the alternative heat rate scenario, what that would be?

Proceeding Time 9:25 a.m. T14

And first of all, I should also make a note that I'm not an expert here, and you'll have to help me out, thank you.

MR. O'RILEY: A: No, I appreciate that.

Well, first of all, I would probably point you to BCUC 1.13.1, which describes the process, and you may have read that already. I'll just quickly look for a good slide to explain this.

Maybe to start, on -- I'll start on the February 9th slides, which are further along in the package, and --

MR. STEEVES: Q: That's in the first yellow section?

MR. O'RILEY: A: It's the second section. There's three presentations.

MR. STEEVES: Q: Right. So this is the second presentation?

MR. O'RILEY: A: The second presentation, yes.
MR. STEEVES: Q: Okay, and that's page --
MR. O'RILEY: A: Page 3.
MR. STEEVES: Q: Three. Okay.
MR. O'RILEY: A: So, just to explain what we mean by the heat rate, there's two steps to our price forecasting process, and the first is determining a gas price forecast, and then we have to have a process for converting it into electricity prices. So when we talk about the alternative heat rate, that's what we're talking about, the method of converting.

And we have two approaches to converting. One is, we use the Henwood model for the first, 2007 to 2012, and then we use this combined cycle reference -- the cost structure of a combined cycle plan to convert from gas to electricity. Our concern in using the -- our original 100 percent recovery, our original so-called base case scenario, was that it didn't reflect the risk of a situation where gas and power prices were much closer together. And that could arise from over-supply in the market, new technology, any number of things. So we wanted to come up with a different relationship between gas and power prices, and that's what the alternative heat rate scenario reflects.

And if you go to these slides, you can see

we looked at a number of different ways of doing that.

MR. STEEVES: Q: Are you referring to this slide?

MR. O'RILEY: A: Yes. Well, this slide shows on the right, there, we've got a -- well, on the left-hand side we're talking about our original base case, and that's the -- in the middle box where we use the Henwood model, and this so-called long run marginal cost, based on a CCGT or a combined cycle generating plant. And on the right, we have another approach to converting from the gas to the electricity.

And if I go forward a few steps, maybe to slide 11 --

MR. STEEVES: Q: Slide 11.

MR. O'RILEY: A: Yes, of the same package.

MR. STEEVES: Q: That's page 11 you're referring to?

MR. O'RILEY: A: Page 11, yes. Sorry.

MR. STEEVES: Q: Okay.

MR. O'RILEY: A: This chart shows the relationship between the gas and the power price, or this market heat rate, as we call it. And our base case, depending on the gas price you use, produces the four market heat rates at the top. We've shown here two alternatives. One is the dashed line in the middle, with the square boxes, and one is the straight line along the bottom. These were two of the other alternatives we considered but did not, in the end,

implement. So you can see -- the point being that the alternative heat rate is much lower than it would be in the base case, in the four lines at the top.

MR. STEEVES: Q: Okay --

MR. O'RILEY: A: Maybe you could help me, if I'm answering your question.

MR. STEEVES: Q: Well, yeah, I was looking for information on those alternative heat rates. And there was a question by Mr. Wallace earlier in the proceedings where he did discuss on 2013 the spike and then the description as to why they're level. I'll leave that right at the present time.

But the analysis that I take -- or my interpretation here is the analysis that you're using on each of these models presents different graph lines because each model is different. If we're looking at slide 13, page 13 --

Proceeding Time 9:30 a.m. T15

MR. O'RILEY: A: Oh, sorry, page --

MR. STEEVES: Q: Long-term forecast gas prices?

MR. O'RILEY: A: Actually, sorry, it's page 11.

MR. STEEVES: Q: Page 11. It's marked --

MR. O'RILEY: A: Yes. For each of those lines there's a different gas and power price as a result of using different assumptions in different models to forecast the prices.

MR. STEEVES: Q: So each model has different assumptions.
MR. O'RILEY: A: There are different assumptions in the different models, yes.
MR. STEEVES: Q: Okay. Moving on, going back to page 4 of your documentation, the benchmark prices, the criteria for selection with regards to time, date, place, market factors, et cetera, how do you derive that?
MR. O'RILEY: A: Okay, I haven't found -- I'm not sure which page 4. There's a number of pages 4s because there's three prices.
MR. STEEVES: Q: This is B and you have the three sections.
MR. O'RILEY: A: Yes.
MR. STEEVES: Q: First section, page 4, which is again -- let's see here, are we looking at the same thing here? Yes, responsibilities of price team. First point or bullet, you have the description of benchmark prices.
MR. O'RILEY: A: Oh yes.
MR. STEEVES: Q: What again is that? What criteria for selection do you use on those?
MR. O'RILEY: A: The benchmark prices are the price forecasts that we're creating. So the point of developing these price forecasts for B.C. Hydro is

that we would use them to test various decisions that we make, and examples would be capital decisions for, say, refurbishing a generator. We would use these prices as an input to the Integrated Electricity Plan work, any number of decisions that affect -- that are dependent on long-term commodity prices. And the price forecasts that we create, those are referred to here as the benchmark prices.

MR. STEEVES: Q: And are they static or changeable?

MR. O'RILEY: A: They do change over time based on --

MR. STEEVES: Q: Within the model?

MR. O'RILEY: A: The prices -- within the model there's an annual price for each year, and that annual price is broken down into a monthly on and off peak price, and there's a gas price that's broken down into a monthly price. And so those prices changed over time throughout the life of the forecast.

There's also from time to time, we change the input assumptions and we change the modelling approach, and we've talked about some examples of that in these documents. So the price forecast change as a result of those changes to the inputs and the modelling.

MR. STEEVES: Q: Okay. Moving on to page 11 of the first section, this is page --

MR. O'RILEY: A: Yeah, it doesn't have a number on it.

MR. STEEVES: Q: Forecast windows and components. First I'd like to back up and inquire. I understand that now we are dealing with, under Tier 1, the Pristine Power with duct firing. The duct firing, does that use natural gas or does it use distillates?

MR. O'RILEY: A: Well, I'm not an expert on duct firing but --

MR. SANDERSON: This panel really isn't equipped to deal with questions in that area, I don't think, Mr. Chairman.

MR. STEEVES: Q: Well, if they are using distillates, would you not need another line in here on this graph showing the distillates?

MR. O'RILEY: A: I can probably answer that question. We're not using distillates for -- we would not use distillate for duct firing, so we don't have a distillate price forecast.

MR. STEEVES: Q: Okay. Now, moving on to page 19, would you please explain this annual price on spot gas at Henry Hub?

MR. O'RILEY: A: Well, you picked the most complicated chart.

MR. STEEVES: Q: Well --

MR. O'RILEY: A: Okay, we'll do that.

Proceeding Time 9:35 a.m. T16

This is a model that's part of our marginal

cost model, which we've referred to, and that's used for planning the dispatch of the hydro generation. So this is a component of that model. What that model does is it forecasts future spot gas prices over time. And it has a number of inputs. One of those inputs is the NYMEX forward curve. Another is all the historical NYMEX forward curves and NYMEX spot prices. It includes basis curves from NYMEX back to Sumas. It includes information on weather and flows on the Columbia River, all of which is used to forecast a spot gas price.

What these curves represent are the so-called natural logarithms of the -- well, first of all, if I -- if we look at the curve to the right, which is centred around 1.9 on the X-axis, that represents the distribution of the logs of the prices that come out of this model. And you can see, there's a range of prices, and it's centred around 1.9, and that corresponds to about 6.7 dollars per MMBtu.

MR. STEEVES: Q: At six point --

MR. O'RILEY: A: 6.7 dollars for MMBtu. So I just had done that calculation. The vertical line that has no distribution around it, that's fixed, that corresponds to the futures gas price for the -- that corresponds to the spot price. And that's --

MR. STEEVES: Q: Would this be the two underneath,

along the horizontal axis, you have 2004 future and 2004 spot?

MR. O'RILEY: A: Yes.

MR. STEEVES: Q: That --

MR. O'RILEY: A: So that's a fixed line, because that's just what the market's saying the price is. And that price works out to about $6.05. So this person, the analyst that runs this model, is looking at the market price, and it's $6.05 their forecast of prices, given all those other inputs, weather and such, is about $6.70.

The other distributions to the left are just history. So they're -- they're the natural logarithms of prices for the different periods described at the bottom, and you can see the one to the left, which is a solid line, that's equivalent in this -- the mid-point of that is equivalent to $2.35 an MMBtu, and the second one is equivalent to $3.00 an MMBtu.

MR. STEEVES: Q: Okay. So, basically, the lines that you have presented are averages of the various prices for the collective markets that you're dealing with.

MR. O'RILEY: A: Well, the first two sort of --

MR. STEEVES: Q: The future and the spot --

MR. O'RILEY: A: -- peaks to the left, the '89 to 2003 and the '96 to 2003, those are historical prices as

they've changed over time. The one -- the distribution to the far right, centred around $6.70, that is a modeled forecast of prices for 2004. So they're slightly different.

MR. STEEVES: Q: Okay. And I take it that both the future and the spot prices collates together in future days, they arrive at the same point.

MR. O'RILEY: A: That's the theory of convergence that Mr. -- I think -- I'm trying to remember which person spoke to that, but someone talked about the convergence of spot and future prices --

MR. STEEVES: Q: Right.

MR. O'RILEY: A: -- and that's the theory. This is a -- this particular one here is a -- is not the actual spot market price, it's the -- it's a modeled forecast of spot market prices. As you got closer, you would expect your forecast to get better and better.

MR. STEEVES: Q: So you say it's a model, then you're actually not using real-world actual events here?

MR. O'RILEY: A: In this particular slide, the far right distribution is a -- is the output of a model.

MR. STEEVES: Q: Okay. But the model itself is not based on actual current market information?

MR. O'RILEY: A: It has a number -- I mean, it's a model, so it -- it's a simplified version of the real world. I mean, that's what you try and do when you

create a model.

MR. STEEVES: Q: And is this applicable to both the Henwood and the other one?

Proceeding Time 9:40 a.m. T17

MR. O'RILEY: A: It's a complete -- it's actually a completely different model with a different time window. This model is used for optimizing reservoir level -- reservoir operations. So it covers typically zero to five years. So it's a different window than the models we've been talking about in other contexts.

MR. STEEVES: Q: Okay. Unfortunately I don't have enough background information here to really get into that, so I have to move on.

The next question is on the following page. I believe this is page 20, first section. Let's see. Stochastic gas price model market basis -- market basis estimates. Which market and what estimates?

MR. O'RILEY: A: Okay, the basis refers to the difference in price between Henry Hub, which is in Louisiana, and Sumas here in B.C., and AECO in Alberta. So the basis just means difference, and that's something you can buy or sell in the market, so that's what the market refers to. And the estimates, that just refers to the prices that they're getting from the market. So they're taking the basis to equal the market price.

MR. STEEVES: Q: All right. And this came up earlier, I believe, on the second bullet, varies inversely with water conditions. Apparently the water reserves in our own dams determine the prices here.

MR. O'RILEY: A: Well, I don't think this particular point came up earlier. What this point is just referring to is that when there's a lot of water in the Pacific Northwest, including B.C., there tends to be lower prices for electricity, less need to burn gas for electricity. So the market price of gas, relative to what it is in Henry Hub, Louisiana, the difference would be lower. So more water, larger difference, large basis. So that's what inversely refers to.

MR. STEEVES: Q: All right, on page 22, stochastic electricity gas model. You say the probability distribution was made discrete. Has there been any loss of data, if so, what, in doing that?

MR. O'RILEY: A: Well, actually I should say -- I stand corrected. This is probably a more complicated charge than the one you referred to earlier with the graphs. Any time you model -- any time you model data or try and model a natural process and calibrate that with real data, you're losing some information. So for example, with the Hydro conditions we use 1973 to 2003 because that's what we have and it's readily available. So there is model risk introduced there

because you don't have all the information for all the conditions.

MR. STEEVES: Q: Now would this be similar to multiple regression where you're dealing with your degrees of freedom, where you have to -- again you consume sort of the partial data in order to construct it?

MR. O'RILEY: A: Yeah, I'm not sure I understand your question.

MR. STEEVES: Q: Okay, we'd better not get technical here.

MR. PICKEL: A: Let me jump in, Chris. No, they're not analogous.

MR. O'RILEY: A: Okay.

MR. STEEVES: Q: Thank you. On page 25, this is number 2. This is on long-term forecasting 4 to 20 years, number 2.

MR. O'RILEY: A: Sorry, I'm not with you here.

MR. STEEVES: Q: Page 25, first section.

MR. O'RILEY: A: Okay.

MR. STEEVES: Q: Long-term forecasting 4 to 20 years, two steps; step 2, convert gas to power prices. Again, is this -- it says long-term marginal cost based on CCGT. Is this with or without duct firing?

MR. O'RILEY: A: The benchmark combined cycle generator that we use, I believe does not have duct firing.

MR. STEEVES: Q: Okay, so then your model --

MR. O'RILEY: A: I probably should say that subject to check.
MR. STEEVES: Q: Yes.
MR. O'RILEY: A: But I believe it doesn't include duct firing.
MR. STEEVES: Q: It does include --
MR. O'RILEY: A: It does not include duct firing.
MR. STEEVES: Q: Okay.
MR. O'RILEY: A: The benchmark CCGT.
MR. STEEVES: Q: Well, if you don't have duct firing, how does this impact on the model?
MR. O'RILEY: A: If we were using duct firing, it would probably mean a very modest difference in the effective market price that we're calculating. I'm not sure if it would be higher or lower.

Proceeding Time 9:45 a.m. T18

MR. STEEVES: Q: Okay. On page 26, VI, Vancouver Island, Call For Tenders portfolio evaluation. In what regards? What evaluation is -- do you -- are you looking at?
MR. O'RILEY: A: Well, this was referring to the use of the price forecasts in the QEM model.
MR. STEEVES: Q: Basically, the model is applicable in this situation.
MR. O'RILEY: A: The idea was that these price forecasts would go into the QEM model.

MR. STEEVES: Q: Okay. Past -- going on to page 35. This is conversion of gas to power prices, 2007, 2012, Henwood modeling. B.C. Hydro uses the Henwood energy services simulation software using certain inputs based on B.C. Hydro's knowledge of the WECC, Western Electricity Committee or whatever.

MR. O'RILEY: A: Coordinating Council.

MR. STEEVES: Q: What are the certain inputs?

MR. O'RILEY: A: The Henwood model, and Mr. Lauckhart can speak to this in more detail, it comes with a database of assumptions for the west, and they collect that from publicly-available sources. So in certain cases we have better information, primarily about our own province and our own system, so we make adjustments to the data in the database based on our own knowledge.

MR. STEEVES: Q: The data, not their assumptions.

MR. O'RILEY: A: Well, I'd say they're one and the same. There's assumptions about Hydro dispatch and planned generation here in B.C. that we would have better knowledge of than Henwood, so we would make changes to the database to reflect that.

MR. STEEVES: Q: Okay. And do you list these assumptions, both the Henwood's assumption and your assumptions here in the model?

MR. O'RILEY: A: They are -- we have those assumptions,

they're not listed in this document.

MR. STEEVES: Q: Okay. On the next bullet, you have the price of marginal resources. The prices, do you include these in the documentation, or is that just general prices that you use, that you bring in from the model?

MR. O'RILEY: A: Well, maybe I'll ask Mr. Lauckhart to talk about how his model forecasts the marginal -- calculates the marginal resource and the marginal price.

MR. STEEVES: Q: Okay.

MR. LAUCKHART: A: Sure. We do a fundamental based analysis. Our model is set up to do that -- this is the model that Chris's team runs. And it's looking at every hour of the year. And it's looking at what are the loads across the WECC on the -- on that hour, and what is the generation that's available on that hour to try to dispatch against those loads. There's some -- you know, complicated issues surrounding Hydro, because is energy limited, and you have to shape it somehow.

On the thermal side, though, since thermal is always on the margin, we never have situations, except very extreme situations which we're not looking at normally; we never have situations where you don't need some thermal and WECC to meet the load. So we

work very hard to look at all the thermal that's available, what's the incremental costs of operating that thermal. Some is the fuel, some is variable O&M.

In markets that we're modeling, sellers have what we call "bidding strategies," so we have to do something to address how people approach bidding of their resources into this market. And then we stack up, really, in the simplest -- we stack up each thermal resource from the lowest total variable cost to the highest, and then on any hour we can pick the one that's on the margin. We assume economic dispatch is happening in the west, we believe that pretty much happens. And you can then determine, well this is the margin, this is the resource that's on the margin, this is what he's going to bid, that will be the market clearing price.

MR. STEEVES: Q: Okay. Thank you. Moving on, page 36. Conversion of gas to power prices, year 2013 plus. Let's see. B.C. Hydro assumes that long-term marginal resource is an F-series gas-fired generation plant, assumes long run prices will equal our cost of marginal resources, and, down further, F-frame gas generation, gas-fired generation assumptions need to keep current on gas turbine developments and competing generation technologies.

Proceeding Time 9:50 a.m. T19

For the time frame that we're looking at, both short and long term, what type of adjustments would you have to make for developments and competing generation technologies?

MR. O'RILEY: A: Well, the way we've dealt with that is we have this alternative heat rate scenario, which is a lower ratio between electricity and gas prices that is a proxy for any number of conditions that could occur on the market, including new technology and more efficient generation and such. So the risk of a different world unfolding is really reflected in our alternative heat rate scenario.

MR. STEEVES: Q: Okay, is duct firing considered a new technology or development?

MR. O'RILEY: A: I think duct firing would be a very modest increment to the existing F series, so I don't think that would have an appreciable impact on the price overall.

MR. STEEVES: Q: Okay.

MR. O'RILEY: A: I think we're talking here about substantial changes, like a change in the cost structure of coal-fired generation, for example, or widespread use of solar power, for example, any number of things that could drastically change how we see --

MR. STEEVES: Q: Well again, I would like to point out that we're dealing with a mature industry, mature

technology. Power generation uses matured technology. I would think that there's not going to be too many radical changes here, and if there are, would they be able to incorporate these in in the timeframe that we're looking at, considering the very conservative nature of this industry?

MR. O'RILEY: A: Yeah. I guess what we're trying to do -- we're not trying to identify what actual changes could occur. We're just saying that there's things that could happen that could change the relationship between gas and power, and that's reflected in our alternative heat rate scenario, this 25 percent recovery scenario that we talk about. So any number of things could cause that to happen.

MR. PICKEL: A: Let me add to that. The power industry has gone through a fairly large technological transformation in the last 20 years in the shift from steam turbine generation to gas turbines, and the result has been about a 30 percent reduction in fuel use per kilowatt hour.

With the introduction of the next stage of gas turbines, it's probably expected to become commercial in perhaps four to five years, there will be another 5 to 10 percent improvement in efficiency. So that's a continuing issue. I think Chris is also trying to consider other larger technological steps

that could become commercial in ten years or so.

MR. STEEVES: Q: All right. Moving on to page 37, this is conversion to gas to power prices representative mart -- plant details. Again, we have year 2013 and beyond, currently a natural gas-fired combined cycle gas turbine. Again you don't have any reference to a duct-fuelled --

MR. O'RILEY: A: Duct firing.

MR. STEEVES: Q: Or duct firing, sorry.

MR. O'RILEY: A: Yes. This is what I was referring to when I said subject to check I don't believe it includes duct firing. This doesn't reference duct firing, so my assumption is it doesn't. But I will check and confirm that --

MR. STEEVES: Q: And the capital cost that you're quoting here is $200 million. That's for the CCGT. What would that be for duct firing?

MR. O'RILEY: A: I'm not sure.

MR. STEEVES: Q: But does that get incorporated in the model, the 200 million?

MR. O'RILEY: A: This is incorporated into the calculation of the price, the electricity price for 2013 till -- and beyond.

MR. STEEVES: Q: This value.

MR. O'RILEY: A: This value.

MR. STEEVES: Q: This value for the CCGT.

MR. O'RILEY: A: This is completely separate from the QEM model and the valuation of the Duke Point Project and duct firing.

MR. STEEVES: Q: So would you need -- if it was duct fired you would need a different price, right?

MR. O'RILEY: A: You would need. I don't expect it would be a substantially different price, but --

MR. STEEVES: Q: But there would have to be adjustment.

MR. O'RILEY: A: Yes.

MR. STEEVES: Q: Okay. Well, you know, in accounting if you make one change you have to make changes throughout.

MR. O'RILEY: A: Yeah, yes.

Proceeding Time 9:55 a.m. T20

MR. STEEVES: Q: Moving over on page 38, again conversion of gas to power prices, alternative heat rates, alternative heat rate scenario considers extraordinary market conditions. What would be extraordinary here?

MR. O'RILEY: A: Well, here we're talking about a set of conditions that would make it uneconomic for someone to build new conventional generation over time. So an example would be the situation we're in right now, and we've been in for the last three years, 2002, 2003 and 2004, where the heat rate in the market is very low, and it wouldn't support -- that

information would not support the construction of new generation. So that's -- and that's, as we've talked about in -- throughout this proceeding, that's caused by an oversupply of generation in the market. So we're saying that's an extraordinary situation, or a "bust" in the market, if you will.

MR. STEEVES: Q: Is the market bust right now?

MR. O'RILEY: A: Well, if you use the -- think of a commodity cycle, a boom/bust cycle, just in very binary terms, then this would be a bust cycle for people building -- owning these gas-fired generation plants.

MR. STEEVES: Q: Okay, so we're building Duke Point in a bust cycle right now.

MR. O'RILEY: A: Yes, and forecasting and as you see from all the analysis and discussion in this section, we foresee the tightening of supply and demand in the market, and conditions moving towards -- more normal conditions returning over time.

MR. STEEVES: Q: Okay. Looking at all the various items that you list here, are these really extraordinary? The new market efficient generation technologies, retirement of older plants, market prices not reflecting at -- and all in fully recovered costs of new generation, sustained overbuild in generation, et cetera. Are these extraordinary?

Would you say these are all extraordinary?

MR. O'RILEY: A: Well, they -- these are all reflected in our alternative heat rate scenario, which we're giving 50 percent weighting in our analysis, and so we're not giving it a 5 percent weighting, for example. So we're giving a high weighting to the occurrence of these things, so whether they're -- I think what we're saying is the persistence of conditions like we've seen in 2002, 2003, and 2004, for all time, would be extraordinary.

MR. STEEVES: Q: Okay. Moving on, then, to page 44, section 1. Implementation issues. Multiple scenarios, what type of scenarios are you including in your model?

MR. O'RILEY: A: Well, these are the price forecast scenarios that we've been talking about, so the different heat rates and the different gas prices and such that result in different electricity prices.

MR. STEEVES: Q: And you say "large number of alternatives". How many are we talking about?

MR. O'RILEY: A: Well, this refers to evaluation -- project evaluation in general. So any -- when you're doing an integrated electricity plan, for example, you've got many different alternative portfolios that you could consider, dozens and dozens. And what this speaks to is, it's just more difficult to make

evaluation decisions with more scenarios of prices and more multiple --

MR. STEEVES: Q: In other words, if you get too many, you're just sort of inundated by scenarios, and you cannot make a decision?

MR. O'RILEY: A: Well, the challenge is to organize the information in such a way that it's meaningful. This isn't an obstacle, it's just an issue.

MR. STEEVES: Q: Okay.

MR. O'RILEY: A: I wouldn't say it's overwhelming or anything, but --

MR. STEEVES: Q: Again, on to the second bulletin -- bullet, you say an average of scenarios. I have a little bit of trouble with when you say "averages". You know, you can have a very wide distribution, you have very narrow distribution, and the average could be of certain type, and it raises a number of questions. But then it says, "but does not reflect actual uncertainty." Why is that --

MR. O'RILEY: A: Well, it's first of all -- sorry. Sorry.

MR. STEEVES: Q: Why is that?

MR. O'RILEY: A: Well, first of all, we're not talking about distributions here. We're talking about scenarios. So we've got in our forecasting approach, as it ultimately evolves here at -- when we get to the

end, we have three gas prices and two methods of conversion, so we have six electricity prices, and there's -- those are discrete scenarios, no distribution -- there's no distributions around them.

Proceeding Time 10:00 a.m. T21

And what this point is speaking to is that if you average all the prices and apply that to your decision, you get one answer. You might come to a different conclusion if you look at the individual scenarios. So all it's saying is you lose information about the range of outcomes if you average all the prices.

MR. STEEVES: Q: Okay.

MR. O'RILEY: A: Average all the scenarios.

MR. STEEVES: Q: Moving on to the second section at the first yellow page, page -- that would be page 7, this is -- first of all, would you please give a description of why the second part after the yellow section, after the yellow page, what is different from the first section here?

MR. O'RILEY: A: Well, the first presentation was a rather lengthy workshop that we had. It was probably a three-hour workshop with our Risk Management Committee. And one of the outcomes of that -- one of the objectives of that was to settle on this alternative heat rate scenario. And we weren't able

to satisfy the committee, we hadn't provided them enough information, there quite frankly wasn't enough time to come to a conclusion, so we scheduled another meeting to look in more detail at the issue of what alternative heat rate scenario we should use.

So this presents some of the alternatives that were considered and concludes with the same recommendation. And we never actually got to the conclusion in this meeting either, so that's why we had the third meeting.

MR. STEEVES: Q: Okay. And the third meeting would be the third section.

MR. O'RILEY: A: The 27th, yes.

MR. STEEVES: Q: Yeah, okay. All right. In the second section here, page 7, alternative heat rate scenario, Option 2, alternative fuel technology, assumes technology other than natural gas-fired turbines dominate future generator builds. Assumes technology. What are we assuming here?

MR. O'RILEY: A: Well, in the United States and the U.S. portion of the WECC, they're forecasting a lot of new combined cycle gas-fired generation to meet the growing load and offset the retirements that are occurring.

MR. STEEVES: Q: With or without duct firing?

MR. O'RILEY: A: I'm not sure. There's probably a

mix --

MR. STEEVES: Q: Well, please --

MR. O'RILEY: A: Probably a mix of duct firing and non-duct firing. What this says, without getting into a lot of detail, it says, well, what if there's a different future out there and people are putting in wind and coal and any number of other things, different kinds of generation? And the result is a different relationship between power and gas prices.

MR. STEEVES: Q: So we're looking at alternative power generation systems, not just looking at gas turbine systems then when you're referring to this alternative heat rate scenario?

MR. O'RILEY: A: This probably assumes something a little more radical than just marginal improvements in -- this is alternate fuel. So this is not gas, this is other fuels and other resources.

MR. STEEVES: Q: I take it then that you would have to basically assume certain values. In other words, the electricity or the fuel that you're using here, you have to make assumptions as to what these things would be and incorporate them in financial data terms to your model. Is that correct?

MR. O'RILEY: A: Yes, and if you have a next slide, we did some modelling of this, and instead of putting in gas-fired plants to maintain the reserves, we put in

these clean coal plants and tested the result, the result in terms of the relationship between gas and power prices. And it did affect -- I'm not sure what the ultimate, the ultimate -- I don't have the information about what the ultimate heat rate was, but --

MR. STEEVES: Q: Were these based on actual values that were derived from some technology, or were you just assuming out of the clear blue these values, assuming that there is this coal technology, would have these values, and you basically took those values and put them into the model?

MR. O'RILEY: A: We would have had some information about the costs, characteristics of clean coal technology.

MR. STEEVES: Q: Real information.

MR. O'RILEY: A: Real information. I'm not -- I don't recall the exact information but we would have had --

MR. STEEVES: Q: Okay.

MR. O'RILEY: A: -- some objective information to base this on.

MR. STEEVES: Q: All right.

MR. LAUCKHART: A: I might add some clarity on the with duct firing or not with duct firing. In my testimony I have some indication of when some gas-fired units were built in the west, and there has been like 45,000

megawatts in the west constructed since the late 1990s. And if you go to page 9 of my testimony, there is an indication of how much of that is combined cycle and how much of that is duct-fired.

Proceeding Time 10:05 a.m. T22

There's lots of reasons why people choose one or the other, but in -- what we have here, based on what people are doing, is about 21,000 megawatts is combined cycle without duct firing, and about 15,000 megawatts is combined cycle with duct firing.

MR. STEEVES: Q: Okay, I did sort of glance at your section. I did notice that, but I can't make any comment because I didn't really get into it, didn't have time last night. Now, let's see.

Page 9, I believe, this is in the third section? "Alternative heat rate scenario, option three, improving market heat rate." The last two bullets, "a uniform improvement implies a level of accuracy that is not justified," and "specific rate of improvement is difficult to justify." Why is that?

MR. O'RILEY: A: Well, what we did here is we went out to 2012 with our existing approach, and then we just showed the heat rate improving by a fixed amount, 5.5 percent over time.

MR. STEEVES: Q: So you're just making assumption here, takes them out --

MR. O'RILEY: A: Yes. And it was -- it's hard, given the fact that there's a capital stock in the system that has a lifetime to it, and there's only a certain amount of generation that's added each year, and there's a certain profile of improvements in generation technology over time. It's hard to justify that kind of percent increase, you know, for the near term.

MR. STEEVES: Q: Yes.

MR. O'RILEY: A: Just given there's so much capital stock, and the turnover rate is relatively low in the industry.

MR. STEEVES: Q: So these -- this would be applicable only to a certain small fraction of the capital base, just to the new equipment, you're saying?

MR. O'RILEY: A: Well, what our analysis is really looking at market prices for the system as a whole. So there might be an individual plant, or an individual technology, that could conceivably improve on this schedule. But that would -- that's a pretty dramatic improvement. It would be hard to foresee that the overall system, and the existing fleet of generation technology, could demonstrate that kind of improvement over time.

MR. STEEVES: Q: Well, I take it -- first of all, I have to back up and say the model that we're looking

here is specific to Duke Point, right? It's not the overall B.C. Hydro power generation system.

MR. O'RILEY: A: No, it's important to separate -- this price forecasting process is separate and distinct from the evaluation of the Duke Point project, and the EPA, and the other portfolios in the QEM model. So --

MR. STEEVES: Q: Oh, you're losing me here. You're saying you're -- this model's applicable to B.C. Hydro's overall system?

MR. O'RILEY: A: This price forecasting approach that we've talked about is -- applies to the WECC, the Western Electricity Coordinating Council, this whole west-wide region. It attempts to forecast the price in the region. We use that price for any number of decisions, and one of which is the Duke Point project. So when we talk about this efficiency, it's got nothing -- it's got nothing to do with the Duke Point project, it's a -- what we're trying to envision is what kind of scenario would cause market heat rates to be low and stay low for a long period of time, and this is one --

MR. STEEVES: Q: Well, is this -- excuse me, but is this applicable in our situation, where we've set up the analysis for the turbine system, it's supposed to be separate from the rest of B.C. Hydro's overall system, and we're trying to make an evaluation for

Duke Point by itself. So is this model applicable?

MR. O'RILEY: A: Okay. Well, I can touch on that. The -- what we tried to do with the QEM evaluation, in -- being consistent with the various directions and recommendations from the BCUC coming out of the VIGP decision, was to look only at on-Island impacts. The way we did that is, we applied the price forecast, the gas and power prices, to those on-Island portfolios of generation. So we didn't consider any other interactions with the B.C. Hydro system, including the storage or any number of things.

So I think it's a reasonable approach.

MR. STEEVES: Q: So you're trying to take this overall model, designed for the WECC, and you're trying to graft it on to the Vancouver Island for a specific portfolio of a smaller base of power generation systems, and saying that one is applicable to the other.

Proceeding Time 10:10 a.m. T23

MR. O'RILEY: A: What we're trying to do with the price forecasting approach is in the scenarios and the various components of that, is to forecast the price of power and the cost of gas, in -- actually, in our part of the WECC, at the -- roughly, the B.C. border to the Lower Mainland. That depends on supply and demand conditions throughout the WECC, because it's

one big interconnected machine, if you will.

MR. STEEVES: Q: Sure.

MR. O'RILEY: A: What we're doing in the QEM and this evaluation, is we're saying, we just want to look at the -- these portfolios, these Vancouver Island portfolios in isolation, so let's compare them against these market prices that we've calculated for the, sort of, B.C. border market price.

MR. STEEVES: Q: Okay. And hopefully, the conversion here works.

MR. O'RILEY: A: Yes.

MR. STEEVES: Q: Yes.

MR. O'RILEY: A: And that's what we're here to test.

MR. STEEVES: Q: Page 10 of the third section. The alternative heat rate scenario option for current market heat rates, bullet number two, methodology for calculating electricity prices does not depend on natural gas-fired generation. What does this mean? And how does that relate to duct-fired generation?

MR. O'RILEY: A: Well, I'm not sure it relates at all to duct-fired generation. But what it means is, it means the power prices in the long term are not going to be set based on our benchmark combined cycle generating gas turbine plant that we talked about. And that could result from any number of circumstances which we describe, you know, the oversupply --

persistent oversupply, new technology, any number of things. The result of which is a continuation of the low heat rates, or the low relationship between power and gas prices that we've seen for 2002 to 2004, extending that through time.

MR. STEEVES: Q: Okay. All right. That's all I have for Mr. O'Riley. I have to pass on, now, simply because I didn't have enough time to get on to the rest of part 3.

So I have to go over to Mr. Pickel to ask him about -- let's see, where are we here. This would be page 2 of your submission, sir.

MR. PICKEL: A: Yes, sir.

MR. STEEVES: Q: The first section, you refer to -- it came up yesterday -- the GE Maps simulation. The Maps simulation is produced by General Electric. Is that correct?

MR. PICKEL: A: It was originally programmed by General Electric.

MR. STEEVES: Q: Okay. And the generation technology that we're using at Duke Point is General Electric turbine systems, correct?

MR. PICKEL: A: That's correct. But this was programmed by General Electric in the late '70s and early '80s, and it's been used by, I believe -- as I recall, over 20 utilities throughout the world, at a

minimum, and has been -- has separate assumptions that we've prepared with regard to the data, for when we run these simulations. The GE portion just determines how the system operates and that has been reviewed by multiple parties over 25 years.

MR. STEEVES: Q: Okay. And are there other systems that use it? You said there's 20 systems. Are there other systems involved?

MR. PICKEL: A: 20 utilities.

MR. STEEVES: Q: Just -- oh, 20 utilities.

MR. PICKEL: A: One of the alternative systems in the -- in terms of analytical systems, at use in the market. The two major ones are those that apply GE Maps, and we're one of the major consulting firms that does Maps analysis. The other is Henwood.

MR. STEEVES: Q: Okay.

MR. PICKEL: A: And Henwood uses their own model and their own data assumptions.

MR. STEEVES: Q: Okay. But for the analysis that you're using, you're just using the GE Maps.

MR. PICKEL: A: We're using the GE Maps simulation system, and we're using our data.

MR. STEEVES: Q: Okay. But you're not using anybody else's simulation?

MR. PICKEL: A: No.

MR. STEEVES: Q: No. Okay. Well, would there not be a

conflict of interest here? Because you have generation systems, the turbine system from General Electric, and you're basically taking a simulation system provided by the original equipment manufacturer. Wouldn't there be a bias here by the manufacturer to sort of dress things up?

Proceeding Time 10:15 a.m. T24

MR. PICKEL: A: The generator types don't have a label on them. It could be an ABB turbine with the same characteristics, and the answers would be the same.

MR. STEEVES: Q: So you're saying that this F series generator that we're proposing to use for Duke Point, the model would not be specific to that generator.

MR. PICKEL: A: Correct. It's the assumptions about the generator in terms of its heat rate performance, its variable O&M, its fixed O&M, its number of -- minimum number of hours in service, out of service. They're all generic assumptions about power plant operation. And you can't paint one of those assumptions as a GE assumption or somebody else's assumption.

MR. STEEVES: Q: So you have to be fairly specific?

MR. PICKEL: A: About the characteristics of the generator, yes.

MR. STEEVES: Q: Okay. So the model can be -- is applicable for all generators, not just one but many.

MR. PICKEL: A: Yes, and in fact we have assumptions for the WECC in our simulation. We have assumptions for over 1300 different generators in the system.

MR. STEEVES: Q: Okay. That's pretty well it. I don't have any other comments other than going back to Mr. Lauckhart in his analysis. The presentation that he makes, again I'm a little bit troubled in the sense that his model -- how can I put this? Is his model too general to be specific to Duke Point? You have such a broad model here, the western WECC. Is it -- well, let's put it this way.

Is your modelling here suspect if the model is designed for the WECC, can we really put that down to Duke Point Energy?

MR. LAUCKHART: A: Well, we think you necessarily need to look at the WECC in its entirety because the Duke Point Project in fact is going to be in a market that's described by the WECC. So the only way to do a reasonable evaluation of what you think the value of a resource like that is even on Vancouver Island, is to look at what power prices are going to be in the WECC, and then look at how this particular project, or contract in this case, would dispatch against that market.

MR. STEEVES: Q: All right. Thank you, sir, that's all I have today. Thank you.

THE CHAIRPERSON: I think we'll take our morning break now. Mr. Fulton, did you --

MR. FULTON: Mr. Chairman, I just wanted to say one thing with respect to the motion that I think parties should consider, and that's in the context of the order that's being requested against Calpine.

Calpine is a U.S. company. The letter has issued out of the U.S. And I don't believe, Mr. Chairman, that the reach of this Commission would extend to issuing an order against a U.S. company without further steps being taken to make that order acceptable to the jurisdiction of Illinois. So parties should address that.

The ability of the Commission to order a party to attend is found in Section 34 of the *Administrative Tribunals Act.*

THE CHAIRPERSON: Thank you. We'll take 15 -- Mr. Sanderson?

MR. SANDERSON: Mr. Chairman, just one thing also for the parties on that. I would like to get this panel finished and so that the two witnesses in particular from out of town can leave. So I'm going to be asking that we address all other aspects of that after this panel has finished, whenever that may be today, if that's acceptable.

THE CHAIRPERSON: Yes, thank you. Left it to your

election, that's fine.

We'll take 15 minutes now.

(PROCEEDINGS ADJOURNED AT 10:19 A.M.)

(PROCEEDINGS RESUMED AT 10:40 A.M.) **T25**

THE CHAIRPERSON: Please be seated.

Mr. Carpenter.

MR. CARPENTER: Good morning, Mr. Chair, Commissioner Boychuk. We have three undertakings that -- Mr. Wallace has graciously agreed to give us a couple of minutes before he starts his cross-examination, since he is going to be in the order of hours as opposed to minutes with that, that we need to file. I'm not going to reference them other than just give you the transcript references.

The first one appeared at page 2398 of the transcript, and I understand from Commission counsel that the exhibit reference is C6-7.

THE HEARING OFFICER: Exhibit C6-7.

(RESPONSE TO INFORMATION REQUEST AT TRANSCRIPT VOLUME 10, PAGE 2398, MARKED AS EXHIBIT C6-7)

MR. CARPENTER: The next appeared at page 2400 of the transcript, and the reference for it is Exhibit C6-8.

THE HEARING OFFICER: Exhibit C6-8.

(RESPONSE TO INFORMATION REQUEST AT TRANSCRIPT VOLUME 10, PAGE 2400, MARKED AS EXHIBIT C6-8)

MR. CARPENTER: And the last one was at page 2402 of the

transcript, and the reference is C6-9.

THE HEARING OFFICER: Exhibit C6-9.

(RESPONSE TO INFORMATION REQUEST AT TRANSCRIPT VOLUME 10, PAGE 2402, MARKED AS EXHIBIT C6-9)

MR. CARPENTER: Just to ease the electronic filing of those, we've also prepared a CD with those on it, and I'll provide those to the Hearing Officer. And that completes my filings, Mr. Chair.

THE CHAIRPERSON: Thank you.

Proceeding Time 10:42 a.m. T26

MR. WALLACE: Thank you, Mr. Chair.

CROSS-EXAMINATION BY MR. WALLACE:

MR. WALLACE: Q: Gentlemen, I'd like to start out with some of the comments that were in your opening statement, and then probably we'll turn to them in more detail later. But first Mr. O'Riley at transcript 2983, you state at line 20:

> "We did consider market fundamentals. We looked at the increase in the heat rate, I think it was referred to as a jump in 2012, between 2012 and 2013, and we believe that to be consistent with a tightening of the supply/demand balance in light of these market fundamentals…"

And I simply want to be very clear with you, that jump is not caused by market fundamentals. That jump is

caused by the change from the Henwood model to the CCGT turbine model for price forecasting.

MR. O'RILEY: A: The jump is certainly caused by the transition from one model to another. The question was, did that cause any concern or raise any alarm bells, or I think the expression was cause us to go, "Whoa." And we looked at the market fundamentals to reinforce that that was consistent with a tightening of supply and demand balance and we're satisfied with the results of the modelling approach.

MR. WALLACE: Q: Okay, and you go on -- so in your view it's consistent with but clearly not caused by market fundamentals?

MR. O'RILEY: A: The other analysis that I referred to where we have run the Henwood model for longer periods of time, we don't see the same jump in that time period but we do see -- we do see a steadily increasing heat rate up to a more stable, higher-level heat rate.

MR. WALLACE: Q: I'm going to come back later and ask you why you didn't use that model. You mentioned here that you -- you go on and say you

> "…this tightening occurring in the near-term forward markets …"

And I suggest to you again that the near-term forward markets do not have the jump in 2012 to 2013 that your

modelling does.

Proceeding Time 10:45 a.m. T27

MR. O'RILEY: A: The near-term forward markets don't extend to 2012 or 2013.

MR. WALLACE: Q: Okay. So -- okay. Clearly the near-term forward markets, then, have nothing to do with the jump in 2012 to 2013.

MR. O'RILEY: A: Well, I'm -- just to be clear, the reference was to Mr. Sheldon Fulton's testimony, and in Figure 7, where he shows the heat rate calculated from the forward market and forward gas prices for the period through 2010, you do see a steadily-increasing heat rate, which is indicative of a tightening of the supply and demand balance.

MR. WALLACE: Q: You see a steadily- and gradually-increasing heat rate.

MR. O'RILEY: A: A steadily-increasing heat rate.

MR. WALLACE: Q: Yes. And gradually. It's not jumping.

MR. O'RILEY: A: Yes. It's not jumping.

MR. WALLACE: Q: Thank you. And you state at page 2992:

> "And we see in the larger WECC, we see that -- a lot of that new supply coming from gas-fired plants such as this."

Dr. Pickel, would you agree that you only saw 3,000

megawatts of new capacity from 2008 to 2012 coming from CCGTs?

MR. PICKEL: A: That's a net increase. Most of the additions are in the 2008 to 2012 period, but I would add, in that earlier period we have specifically identified units for most of the additions. However, based on the capacity balance we saw in the various sub-regions of the WECC, we were adding generic combined cycles and generic CTs -- the two -- to the -- during that time frame.

MR. WALLACE: Q: Okay, and what I asked you, and I think you agreed, was in the five years from 2008 to 2012, your -- at page 9, you see 3,000 new megawatts coming from combined cycle.

MR. PICKEL: A: Yes.

MR. WALLACE: Q: And that's 3,000 megawatts in a universe of about 193,000 megawatts?

MR. PICKEL: A: Yes.

MR. WALLACE: Q: And I calculate that as about 3/10ths of 1 percent of the total capacity per year. Does that sound about right?

MR. PICKEL: A: I don't think that's correct. It's -- you're saying -- over that period, that's a little less than a thousand megawatts per year over that period, and the total capacity is in the range of 200,000 megawatts, so it's about -- I'm sorry, it's

about a half percent.

MR. WALLACE: Q: Okay. We won't worry about a third of a percent or a half a percent, it's a very small number, isn't it, sir?

MR. PICKEL: A: Yes.

MR. WALLACE: Q: Thank you.

MR. PICKEL: A: But after that time period, in -- based on other analysis, we do see the market tightening up more, and we anticipate there will be more additions shortly after that period. But our analysis was limited to 2008 and 2012 as snapshots.

MR. WALLACE: Q: Thank you.

Mr. O'Riley, I'd like to turn to your evidence first. And right at the start of it, at page one, line 8, you quote Mr. Fulton, and you state:

> "At page 6, lines 11 to 14, Mr. Fulton says this: 'It needs to be re-stated that this adjustment to the energy margin is simply a result of using the EIA forecast power prices as well as the EIA gas price forecasts. It is difficult to understand why the analysis model is trying to suggest the EIA gas forecast is correct, but their power forecast is understated.'"

And my first question is, you -- I take it you understand that the adjustment to the energy margin

there is the jump we were talking about?

MR. O'RILEY: A: No, I don't believe that's the case.

MR. WALLACE: Q: Oh. Okay.

MR. O'RILEY: A: He -- yeah. I recall from Mr. Fulton's evidence that he reduced our energy margin by, I believe, 42 percent, based on his recalculation of the heat rate, using the EIA cost of service forecast and the EIA market gas forecast.

Proceeding Time 10:50 a.m. T28

MR. WALLACE: Q: Okay, I think I should have stuck with my original question. You're quite right.

But as you understand it, what he was doing then was looking to see what happened to the energy margin if one used an EIA power price forecast for the years 2013 to 32 instead of the CCGT price used by B.C. Hydro.

MR. O'RILEY: A: Well, I think Mr. Fulton called it a power price forecast, but I think we've established that it's not a power price forecast, it's a forecast of cost of service rates for generation in states that are regulated, and market prices in some states, unnamed states, that are deregulated.

MR. WALLACE: Q: Okay, I'm going to come back to that, but the impact of that adjustment was, as you said, a reduction of 42 percent in the energy margin?

MR. O'RILEY: A: I believe that's the case.

MR. WALLACE: Q: Okay. And you're not arguing with the calculation, you're arguing that it's not appropriate to use the EIA electricity price.

MR. O'RILEY: A: Well, there are a number of reasons that we've argued for not using the EIA price, which relate to the calculation as well. I mean, absent -- or in addition to the issue of what it's actually trying to forecast, there's the locational issues and the shape issues and such.

MR. WALLACE: Q: Okay.

MR. O'RILEY: A: And we also, I believe, had a disagreement with Mr. Fulton over the application of the treatment of the variable versus fixed cost of the connection charge.

MR. WALLACE: Q: Okay. If I can -- well, I want to go there, I guess, but what I was trying to get at is you're not arguing with his arithmetic, you're arguing with the appropriateness of EIA elecftricity price given the way it is generated and the way it was applied?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: Thank you. And you give four reasons there: the EIA is not forecasting a market electricity price per se; the EIA forecast does not specify a location; the EIA does not provide details of monthly or season shape; and Henwood, I think, has

served B.C. Hydro better, up at the top of page 2.

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: Okay, and I'd like to look at them one at a time. YOu say EIA is not forecasting a market elefctricity price *per se,* and I take it your point there is the one you just made to me, that it's a mixture of market and cost of service prices?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: You'll agree that the EIA calls it an electricity price, power price?

MR. O'RILEY: A: Well, the EIA, they call it an electricity price and then they go on to define what they mean by price.

MR. WALLACE: Q: Yes.

MR. O'RILEY: A: So it's not what I would call a price.

MR. WALLACE: Q: Okay.

MR. PICKEL: A: I would add to what Chris has to say is it's not an appropriate price to consider for the dispatch of power plants.

MR. WALLACE: Q: Okay. And we're going to get into why. But just with that terminology, you call the output of your CCGT run the gas through it, a EIA price, don't you?

MR. O'RILEY: A: No, and I think I clarified that in my direct evidence. That's a -- when we call it the EIA price, it's shorthand for the EIA gas foreast put

through our conversion process for getting from gas to power. So that's just shorthand.

MR. WALLACE: Q: It's clearly not a price, is it?

MR. O'RILEY: A: Well, the results of that process is a foreast of electricity market prices.

MR. WALLACE: Q: Okay.

MR. O'RILEY: A: That's what it is.

MR. WALLACE: Q: No, we don't need to take it further. Now to the extent it uses cost of service prices, presumably those cost of service or cost of service derived prices, those will be based on cost and presumably the full cost by the regulator?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: Okay. And regulated cost is generally attempting to be a proxy for market? It's a purpose of regulation?

MR. O'RILEY: A: I'm not sure that's the purpose of regulation, no.

MR. LAUCKHART: A: No, I would disagree with that. A market that we're talking about here is a price that you can get on an hour by selling to some buyer for purpose. A regulated price is cost-based what's allowed in rates.

MR. WALLACE: Q: Okay, and isn't --

MR. PICKEL: A: And to add to what Richard had to say, it includes in the mix plants produced or built back

in the 1950s and '60s. It includes nuclear plants that have low incremental operating cost and very high average cost. It includes everything you can throw in.

Proceeding Time 10:55 a.m. T29

MR. WALLACE: Q: Okay. But I suggest to you a full regulated cost is likely to be greater than a marginal cost, in most circumstances, which is a variable cost.

MR. O'RILEY: A: Not these days.

MR. LAUCKHART: A: No, that wouldn't be true. If you just take, for example, Bonneville Power's rates, which are part of this EIA forecast of generation costs, Bonneville's -- almost their entire supply is hydro-based. So they're having a very low-cost hydro element in their generation cost. Bonneville's charges that they make, cost-based charges in their rates, are significantly below the market.

MR. WALLACE: Q: But above the variable cost, I'm sure, of that production.

MR. LAUCKHART: A: The variable cost of --

MR. WALLACE: Q: Of that hydro production. The --

MR. LAUCKHART: A: Sure, so --

MR. WALLACE: Q: -- costs they put in are way above their variable cost, which is what they would bid into the market.

MR. O'RILEY: A: My experience is, Bonneville doesn't

bid their variable cost in the market very often, unless they have absolutely no other options.

MR. LAUCKHART: A: No, Bonneville will follow the market, they will bid what they think the marginal resource is going to cost.

MR. WALLACE: Q: Your second criticism is the EIA forecast does not specify a location. Do you know the relationship of mid-C to North American prices generally? Is there a consistent relationship?

MR. LAUCKHART: A: Well, I can address that. We forecast power prices across all of North America, and it depends on the loads in one area versus another area, and the supply. There's not a lot of ability to move power from the eastern interconnect to the western interconnect. And so their load resource balance at any moment in time might be significantly different than the load resource balance in the west. So sometimes theirs are lower than ours on a spot market price, sometimes higher. But what we are talking about here is the EIA numbers, which aren't even spot markets at all, they're really retail rate prices.

MR. WALLACE: Q: Yeah. And what I'm asking you is, in the market, is there a consistent relationship between mid-C prices and the rest of North America? Are they higher, are they lower? Just, it doesn't -- you don't

know.

MR. LAUCKHART: A: It changes from time to time.

MR. WALLACE: Q: Okay. No consistent relationship?

MR. LAUCKHART: A: That's pretty much the case.

MR. WALLACE: Q: Thank you. The next criticism is the EIA does not provide details about monthly or season shape. I take it nor does the CCGT derive prices?

MR. O'RILEY: A: That is correct.

MR. WALLACE: Q: And next, you state B.C. Hydro concluded the industry accepted the Henwood model better met B.C. Hydro's needs as it provided a better forecast of electricity prices and was more transparent. You only use Henwood to 2012?

MR. O'RILEY: A: That is correct.

MR. WALLACE: Q: And you realize that the years that Mr. Sheldon Fulton takes most issue with are 2013 and beyond?

MR. O'RILEY: A: That is correct.

MR. WALLACE: Q: And I think you have agreed with me, but maybe you've had a chance to look at the calculation. Would you agree that 91 percent of the energy margin under the QEM arises after you stop using Henwood? In the last 19 years?

MR. O'RILEY: A: I haven't done that calculation, but I would accept that, subject to check.

MR. WALLACE: Q: Thank you. Why didn't you use Henwood

from 2013 on?

MR. O'RILEY: A: Well, we have -- we look at that -- we've been doing it this way for at least four years now, this transition from a -- I'm using the Henwood for the near-term and going to the CCGT. Really, it's a short-cut, because there's a time involved with running the Henwood model. And the way you run the Henwood model is, beyond a certain point, you need to make judgments about -- you need to add resources to maintain the reserve margins, which requires a certain judgment. And typically, the resource adds are combined-cycle generators, and what we've found -- and we've repeated the results regularly -- we re-run the results regularly -- is that you get pretty much the same answer if you run Henwood model -- the Henwood model out till 2025 or 2032 as you get by using this CCGT shorthand approach.

MR. WALLACE: Q: Okay. Now, markets have obviously changed in the last four years. In spite of that, you've continued with this shorthand, or -- I'm sorry, what did you call it? It was actually a good expression.

Proceeding Time 11:00 a.m. T30

MR. O'RILEY: A: I called it the shorthand approach.

MR. WALLACE: Q: Okay. And that hasn't been reflected in your use of the CCGT. You're continuing to use it

in the same manner.

MR. O'RILEY: A: We have -- I mean we continue and continued this year to look at the results that you get by running the Henwood model for the long term. And we believe our approach is still valid. I'm not sure the long-term market has actually changed that much in the last four years. There's certainly been a lot of changes in the short-term market, but I'm not sure we've seen the same in the long-term market.

MR. WALLACE: Q: Do you or Powerex use the CCGT in any way for hedging or power purchases?

MR. O'RILEY: A: B.C. Hydro uses these price forecasts for any number of decisions, including long-term contracting, benchmarking long-term contracts, the various calls that have been done and their use in the IEP. Powerex doesn't transact in that window, so it wouldn't have used this approach.

MR. WALLACE: Q: Okay.

MR. O'RILEY: A: If Powerex was to transact for the long term, we would apply the B.C. Hydro price forecasts against that to test the decision.

MR. WALLACE: Q: Right, but presumably if they're hedging, they would probably be using markets, not CCGT forecasts.

MR. O'RILEY: A: Well, if market prices are available, they would be using markets. One of the reasons we're

using the forecast and using the CCGT is we don't have market prices for this time period.

MR. WALLACE: Q: Now, on Table 1 to your evidence, Mr. Riley, and it's just prior to I guess the first yellow page or before the January 27th, you have the January 2005 NYMEX natural gas pricing?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And it shows the cost of a January 2005 contract at various stages over a three-year period?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And there's substantial variation there.

MR. O'RILEY: A: Yes, there is.

MR. WALLACE: Q: And that's for a variety of reasons.

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And forecasts over this same period have varied greatly also, haven't they?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: The difference is that one can contract for these prices that are shown on the table, and one can't contract with a forecast?

MR. O'RILEY: A: Yes, and that's the -- I mean I've used January 2005 as illustrative because we have the data. Obviously we don't have gas market prices for the time period that we're considering for this

contract evaluation.

MR. WALLACE: Q: And if one had a forecast that was smarter than the market, one could arbitrage very successfully?

MR. O'RILEY: A: Yeah, the ability to do that would depend on your, you know, risk tolerance and any number of things. But I --

MR. WALLACE: Q: But if it was -- if your market, if your forecast was consistently better than the market in predicting where prices would be in the future, you could arbitrage and make yourself a great deal of money.

MR. O'RILEY: A: Yeah, I wouldn't call that an arbitrage because an arbitrage is typically when you're locking in a risk-free profit --

MR. WALLACE: Q: Okay.

MR. O'RILEY: A: -- so you buy one thing and sell another thing.

MR. WALLACE: Q: -- will do for me.

MR. O'RILEY: A: You could take risk, you could buy or sell the market price if you thought your forecast was better, and perhaps you could make money over time. People try to do that.

MR. WALLACE: Q: Well, if it was better by definition and you invested with it, you could make quite a bit of money.

MR. O'RILEY: A: Yeah.
MR. WALLACE: Q: Do you or Powerex use Hedgewood for making hedging decisions?
MR. O'RILEY: A: Well, we don't -- you mean Henwood? Henwood, yes. We do -- well, I don't work at Powerex anymore, but when I worked at Powerex we did consider and look at the Henwood price as an input to decision-making, and that's where we first started with Henwood. I was involved in the first contracting with Henwood to do forecasting, and we were involved in that at Powerex, and the initial intent was to get a better understanding of the market. Since then we also have contracted with other third party forecasters, and Pyra for example is one of the firms we use for the short term. They have a particular focus on the short term which is more in line with Powerex's focus.
MR. WALLACE: Q: Well, at slide 13 of your January 27th presentation, you have a statement assumption: "Forward prices are the best estimate of future spot prices." And is that an assumption that is basically used by Powerex on a working basis?

Proceeding Time 11:05 a.m. T31

MR. O'RILEY: A: This is a B.C. Hydro assumption, and this is -- applies to the first window of the price forecasting period that I spoke of in -- well, it's

described on page 12. And that's the one- to three-year window, where there are market prices readily available.

MR. WALLACE: Q: Okay. And going out further -- well, I'll leave it at that, thank you.

If I could turn, then, where we -- well, into the slides that we're now looking at. Slide 2 of the January 27th presentation, and I think you indicated earlier this is a -- was an internal review of the price forecasting process at B.C. Hydro?

MR. O'RILEY: A: It was a workshop of the risk management committee, which is where the price forecast reports to, if you will.

MR. WALLACE: Q: Okay. And who would have been responsible for making this presentation?

MR. O'RILEY: A: There's a number of individuals on the price forecasting team, and some of them, including myself, would have made various parts of this presentation.

MR. WALLACE: Q: Okay. Now, would any of those -- I'll leave it at that for the moment, then.

So this would be basically you and your staff?

MR. O'RILEY: A: They're not my staff. They -- the price team is what we -- how we refer to it, is made up of people from across the company. And at the

time, the team was chaired by Ms. Hemmingsen. And since I became the Chief Risk Officer, I'm -- actually become the Chair of the team, so as of last April.

MR. WALLACE: Q: Okay. Would Ms. Hemmingsen still be on the team, then?

MR. O'RILEY: A: She's on the team, yes.

MR. WALLACE: Q: Okay. Would anybody else who was associated with the QEM -- or with the CFT, be on the team responsible for these presentations/

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: Who else?

MR. O'RILEY: A: There's a slide that was --

MR. WALLACE: Q: Oh.

MR. O'RILEY: A: -- the individuals that are there.

MR. WALLACE: Q: Okay. And --

MR. O'RILEY: A: On page 6.

MR. WALLACE: Q: Thank you. I'm going to come to that, then.

MR. O'RILEY: A: Okay.

MR. WALLACE: Q: I thought that that was a bigger group than the team actually responsible for the presentation.

MR. O'RILEY: A: Well, this team is the people that -- this group of people are the people involved who were at the time involved with the price team.

MR. WALLACE: Q: Okay, thank you.

MR. O'RILEY: A: And some of those people would have made -- involved in the presentation, and I can point you to the people that are --
MR. WALLACE: Q: Sure.
MR. O'RILEY: A: -- you probably know the people that are involved in that.
MR. WALLACE: Q: I think I do.
MR. O'RILEY: A: Okay.
MR. WALLACE: Q: We'll come to that slide in just a minute. Thank you. It just -- I thought that was a bigger group.
MR. O'RILEY: A: Sure.
MR. WALLACE: Q: Now, there are obviously two objectives. One was to raise understanding of price forecasting. The other, which is of more interest to me, is to obtain approval for use of alternative heat rate scenario and price forecasting process. And I take it that was a goal right from the start of these three workshops that we go through?
MR. O'RILEY: A: Yes.
MR. WALLACE: Q: And can you describe -- at that point -- it obviously evolves during the three sets of presentations. At that point, what -- can you describe what that goal was a little more?
MR. O'RILEY: A: Well, originally, if you go back a number of years, we -- our -- we had a single price

forecast. A single gas and a single power price forecast. And we became increasingly concerned about relying on a single forecast, because of the risk involved in the cost -- or prices of these commodities. So we developed this scenario approach, and that included scenarios of gas and scenarios of the conversion from gas to power.

MR. WALLACE: Q: Okay. Thank you. If we could turn to slide six, then, which is the membership -- and that is the team, then, that was -- and if I can clarify, either responsible for making the decision or responsible for directing the presentations? It's not clear to me which.

MR. O'RILEY: A: This is the -- these are the members of a price team, which is this cross-company, cross-functional project team, if you will. An ongoing project team. So a number of the people here would have had input into the presentation, and some of them gave portions of the presentation.

MR. WALLACE: Q: Okay. And I see at least three -- well, Mary Hemmingsen, Rohan Soulsby, being involved with the CFT. Obviously you've been involved with the CFT. Were any of these other members involved with the CFT?

MR. O'RILEY: A: Well, Mr. Ince had -- was involved, working for Mary -- working for Ms. Hemmingsen, was

involved in the CFT. And Mr. Rich may have had -- would have been involved in the CFT. And I believe that's it.

Proceeding Time 11:10 a.m. T32

MR. WALLACE: Q: Okay, thank you.

MR. O'RILEY: A: And just to clarify one other thing you said, this team doesn't make the decision. The price team reports to the Risk Management Committee, which at the time was chaired by the chief financial officer. So they have the ultimate decision in terms of the prices.

MR. WALLACE: Q: Okay, so you were -- then this exercise was to get something to make a recommendation to the head of the Risk Management Committee?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And who would have been head of Risk management at that time?

MR. O'RILEY: A: Ms. J. Grewal.

MR. WALLACE: Q: Okay, and am I right that that's your position now?

MR. O'RILEY: A: I'm the Chair of the Risk Management Committee now, and at the time the Risk Management Committee was chaired by the Chief Financial Officer, and with my role that moved to the Chief Risk Officer.

MR. WALLACE: Q: Thank you. And I guess we'll come to it later, but just on -- once you did make a

recommendation, who was on the team that actually made the yes or no with respect to the recommendation?

MR. O'RILEY: A: Who was on the Risk Management Committee?

MR. WALLACE: Q: Committee, yes. I guess it's the Risk Management Committee that accepted it.

MR. O'RILEY: A: Yes, the Risk Management Committee includes the CFO, the general counsel, the heads of the three main business lines, Generation, Distribution, and Powerex; the vice-president of sustainability; and then there are a number of sort of second tier members which are senior managers in the company.

MR. WALLACE: Q: Thank you. Now, slide 10 looks at the methodologies that were currently in place? Am I correct on that? With the exception, I guess, of number -- the final one, the alternative heat rate?

MR. O'RILEY: A: Yes. That's correct, yes.

MR. WALLACE: Q: Okay. And that was a new proposal, or a proposal for a change within Hydro.

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And basically it was going to be the alternative gas price times the market rate. And you have 8200 megawatts per hour there?

MR. O'RILEY: A: Yeah, I think the units on that are actually reversed. It should be MMBtu per megawatt

hour, but --

MR. WALLACE: Q: Thank you. And from 2013 on, that would have been a much lower price than the CCGT used in the QEM?

MR. O'RILEY: A: It would have been lower than 100 percent recovery. It also would have been lower than the 25 percent recovery case.

MR. WALLACE: Q: Thank you. Just I guess because we're going to hit it later -- well, no, I'll wait until we get there. If you could turn to slide 13, actually we've dealt with that.

Slide 26. And this is -- you did discuss it with Mr. Steeves earlier; the applications where the long-term price forecasts are used within B.C. Hydro?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And I guess a couple of the programs that I would like to ask about, Power Smart is -- does it use the CCGT price forecasting model that you are using for the QEM?

MR. O'RILEY: A: Well, again there's a separate price forecasting approach and versus the application, so those are separated. And so if they're making a decision in the long term, they will test that decision against the B.C. Hydro forecasts, and those price forecasts use the CCGT and the two scenarios.

MR. WALLACE: Q: Well, I guess that one of my concerns is consistency of using the forecasts. And when we were on slide 10, there were six approaches and the alternative heat rate. It appears that, you know, one particular variation has been chosen for the QEM, and I'm wondering when it goes to say Power Smart or to IEP or Resource Smart, do they get a choice, or is it now the approach that's used under the QEM? Being EIA-derived, high and low.

Proceeding Time 11:15 a.m. T33

MR. O'RILEY: A: Yeah. Well, I think on Panel 2 we talked about the decision to use a subset of the gas and electricity price forecast for the QEM. So that was not the intent when we developed these scenarios.

MR. WALLACE: Q: So the answer is that Hydro at this time is not adopting the QEM high/low for all purposes, it's simply for the purpose of this?

MR. O'RILEY: A: Our approach that we're applying is to use all six forecasts, yes.

MR. WALLACE: Q: For other items.

MR. O'RILEY: A: For all -- yes.

MR. WALLACE: Q: Okay. If we go, then, to -- sorry. Slide 36. You talk here about the use -- the conversion of gas to power prices, and this is, I take it, basically the QEM approach? The F-series gas-fired generation plant?

MR. O'RILEY: A: Yeah. I wouldn't call it the "QEM approach". It's our approach for forecasting prices beyond 2013.
MR. WALLACE: Q: Okay.
MR. O'RILEY: A: Which happens to be used in the QEM.
MR. WALLACE: Q: Okay. And used -- the same approach is used elsewhere with different gas forecasts --
MR. O'RILEY: A: Yes.
MR. WALLACE: Q: -- I guess is the point you're making.
MR. O'RILEY: A: Yes.
MR. WALLACE: Q: Okay. Thank you. And --
MR. PICKEL: A: I'd like to add to Chris's answer. We tested whether, in the generic technology, F-class versus H-class would make a difference, for those 3,000 megawatts of combined cycles you asked about earlier from me.
MR. WALLACE: Q: Yes.
MR. PICKEL: A: And the net impact was less than a tenth of a percent in capacity factor. And we went further than that, and added from our analysis, unnecessary because of capacity, a 500 megawatt generic H-unit in the Lower Mainland. And it only had a net impact on the Duke Power plant of 1.4 percent reduction in capacity factor, and that's because the units being backed down were outside of B.C., largely, if you looked at the top five units being backed down.

MR. WALLACE: Q: So that means they were being driven by a price somewhere else, then.
MR. PICKEL: A: Correct.
MR. WALLACE: Q: And where was that?
MR. PICKEL: A: Well, most of them were in Washington and Oregon.
MR. WALLACE: Q: Mid-C, are we talking, then, as a market driver?
MR. PICKEL: A: No, not mid-C. They were units on the Columbia. Toward -- along the Washington/Oregon border. Hermiston, Wallula, and others.
MR. WALLACE: Q: Okay. But wouldn't the pricing affecting them be mid-C prices?
MR. PICKEL: A: To a degree.
MR. WALLACE: Q: Okay.
MR. PICKEL: A: But those markets are a little bit different than mid-C.
MR. WALLACE: Q: What heat rate did you use for your gas turbines?
MR. PICKEL: A: We used a higher heating value heat rate of 6600.
MR. WALLACE: Q: Okay.
MR. PICKEL: A: BTUs per kilowatt hour.
MR. WALLACE: Q: And was that for both?
MR. PICKEL: A: All H-unit -- all generic H-units were that heat rate.

MR. WALLACE: Q: Okay. And the heat rate for this plant, based in the same units -- and I just want to make sure, I know we switched the terms.

MR. PICKEL: A: For the -- yes. For this unit, we used 6986 BTUs a kilowatt hour, as I note on page 1, line 35 -- line 34 of my testimony.

MR. WALLACE: Q: That's fine. No, I just wanted to make sure we were consistent, because sometimes we're talking 7000, 7300, some other times when we switch units, and simply want to make sure we're consistent.

Now, you state at the bottom of that sentence, one interpretation -- or that slide, one interpretation is that this represents B.C. Hydro's cost of alternative supply. And I guess I'm asking you, will -- is that what's going to be used for the other purposes? Power Smart, stepped rates, or again, do we have flexibility when we come to decide those?

Proceeding Time 11:20 a.m. T34

MR. O'RILEY: A: Again this is -- here we're referring to the 2013 price and beyond. This doesn't mean, and I think we mention it here, the price team doesn't determine the price of a particular product or acquisition or what-have-you. It's just a set of benchmarks against which to evaluate projects or opportunities. So whatever stepped rates uses, we will evaluate it against this but it doesn't mean that

the stepped rate is going to be this price.

MR. WALLACE: Q: Okay, and the reason I ask is not because I want to find stepped rates or get advance notice, but I'm looking for consistency.

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And we'll leave your answer where it is.

I'd like you to turn to slide 38, which is alternative heat rate scenario. And this is the scenario where you use the current market heat rate of 8200 MMBtu?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And the reasons for that are given above where you say it addresses comments from the VIGP hearings, and considers extraordinary market conditions that stress the expected relationship between gas and electricity prices?

MR. O'RILEY: A: Yes. The reasons -- the reasons, I wouldn't say are given above. The reason for using a lower heat rate is really just to test the relationship between gas and power prices. And these are some of the -- in the second bullet, these are -- the second bullet with the items underneath, those are scenarios that could occur, could cause heat rates to be lower in the market.

MR. WALLACE: Q: Well, aren't heat rates by definition

market? I'm sorry, could be -- don't you mean could cause heat rates to be lower than a full CCGT conversion?

MR. O'RILEY: A: Yes, yes.

MR. WALLACE: Q: Thank you. And so -- or even lower than a partial CCGT gas conversion rate.

MR. O'RILEY: A: Yes, these are lower than our 25 percent recovery scenario, yes.

MR. WALLACE: Q: Thank you. And you include new, more efficient generation technologies, and I'm wondering, do you include for example oil sands co-gen in that type of possibility?

MR. O'RILEY: A: I think that would -- we didn't talk about specific -- we're not talking about specific resources, but a general overbuild of generation, one source of which could be oil sands, is what we thought would drive heat rates down.

MR. WALLACE: Q: Okay, and I'm not sure, Mr. Lauckhart, maybe you're familiar with it because you have a regional perspective. Isn't there a substantial amount of speculation, talk, planning for oil sands co-generation?

MR. LAUCKHART: A: There's a lot of talk about a lot of resources. What we're trying to do is figure out what we think as a reasonable amount that might come in.

MR. WALLACE: Q: What do you think will be a reasonable

amount for that?
MR. LAUCKHART: A: Well, we have it in our forecast, what we think is a reasonable amount that will come in. And that's the basis for the heat rate curve that we have on our curve on 81A, Exhibit 81A that was handed out yesterday.
MR. WALLACE: Q: 81A which, yes, I have here somewhere. And for which curve on 81A?
MR. LAUCKHART: A: Pardon me?
MR. WALLACE: Q: For which curve on 81A? I'm sorry, there are numbers --
MR. LAUCKHART: A: Well, there's one there that says Lauckhart, so I guess that's the one that's attributed to me.
MR. WALLACE: Q: Okay. Thank you. And you have oil sands co-generation in there, okay.
MR. LAUCKHART: A: We have some new generation in Alberta.
MR. WALLACE: Q: Okay, and coal generation I presume, in Alberta?
MR. LAUCKHART: A: I don't have it right here at my fingertips exactly what we have in Alberta.
MR. WALLACE: Q: Yes, but presumably the Alberta generation at this time is likely to be oil sands or coal, not gas?
MR. LAUCKHART: A: You know, I don't know that for

sure. I mean we can all speculate but --

MR. WALLACE: Q: Well, it's your curve, sir. I'm asking you about it. I'm not speculating.

MR. LAUCKHART: A: What I have in my model for this curve is some specific generation that we've assumed it's going to be built in Alberta. Sitting here as I sit here today, I can't say what those units are.

MR. WALLACE: Q: Okay. Are you able to provide that later?

MR. LAUCKHART: A: Sure.

MR. WALLACE: Q: Could you do that, please?

Information Request

MR. SANDERSON: Mr. Chairman, I'll inquire at the break. I'm quite happy for Mr. Lockhart to provide that, provided that it means a phone call back to his office modelers or whatever. If that's what it takes, then of course we'll produce it today. If it took something much longer, then I might have something more to say. But for now we'll look into that over lunch.

MR. WALLACE: That's fine, Mr. Chairman. I'm assuming -- if it comes in by a response from Mr. Sanderson by mail on Monday, or e-mail, I'm fine too. I would assume finding out what that is should not be difficult.

Proceeding Time 11:25 a.m. T35

MR. WALLACE: Q: Just to make sure the question is clear, I would like to know the type of new generation and the amount of new generation you have, out of Alberta, in that curve.

MR. LAUCKHART: A: Sure.

MR. WALLACE: Q: Thank you.

Now, if we turn to slide 40, this shows your alternative heat rate in comparison to other price forecasts that you're using?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And the alternative heat rate, is that flat line at the bottom substantially below the other lines?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And this particular graph also illustrates fairly strongly the jump that occurs between 2012 and 2013?

MR. O'RILEY: A: In -- certainly in -- it's hard to -- in the black and white to pick out the scenarios, but certainly in the top line there's the -- there is the jump, yes.

MR. WALLACE: Q: And it would seem evident in the second and third lines also?

MR. O'RILEY: A: Yeah, it's a different transition in the second and third lines. I mean, I'd also point out there's the flat line over -- I mean, there's also

a flat line over time, and I think I mentioned in the direct evidence that we're not saying the line's going to look exactly like that. There will be periods of time when the heat rate is above and the heat rate is below, and it -- we would expect it to oscillate around, so to me, the transition -- the shape of the transition is less meaningful than it might be to others.

MR. WALLACE: Q: Now, I take it that your position is that the current market rate, market heat rate, is too low to encourage new CCGT generation.

MR. O'RILEY: A: Well, there is only a current market heat rate available for a few years. And I'm not sure if that's what you're referring to or not.

MR. WALLACE: Q: Yeah, this 8200 that you -- and the current experience. And I go back to your statement, I think it was to Mr. Steeves, that over the last three years, the market heat rate has been very low, would not support new generation, and -- so that's what I was taking would not support new --

MR. O'RILEY: A: Yes. Okay. So you're talking about the historical heat rate over the last three years. If you're building a generation -- a generator to capture energy margin, you would not build it based on those heat rates.

MR. WALLACE: Q: You would definitely not build a CCGT

new generator --
MR. O'RILEY: A: You would not, no.
MR. WALLACE: Q: -- at that current heat rate -- or the heat rates we've experienced for the last three years.
MR. O'RILEY: A: Yes, that's correct.
MR. WALLACE: Q: Can I take it from that that we agree, then, that the gas price has not been driving the market heat rates for the last three years?
MR. O'RILEY: A: I think the heat rate is driven by this -- the mix of resources needed to meet demand. So I would say very much that the gas price has been driving the electricity price over the last three years. And it's just been driving it at a very low heat rate.
MR. WALLACE: Q: Okay. So --
MR. O'RILEY: A: So that --
MR. WALLACE: Q: Let's put it this way. CCGTs have not been driving the heat rate over the last three years.
MR. O'RILEY: A: Actually, I would say yes, they have. The variable cost of CCGTs are driving the heat rate -- have been driving the electricity price over the last three years, and that's why the heat rate is eight.
MR. WALLACE: Q: And --
MR. O'RILEY: A: So it's the distinction between the short-run marginal cost and the long-run marginal

cost.

MR. WALLACE: Q: And then maybe we can get to the point, at least that the heat rates are not adequate to recover the long-run marginal costs of a CCGT plant, at this time?

MR. O'RILEY: A: The -- certainly, the heat rates we've experienced in the last three years are not adequate to recover the capital cost. That's a fact.

MR. WALLACE: Q: Okay.

MR. LAUCKHART: A: And that's why you're finding so many power plant owners who are exposed to merchant power filing for bankruptcy.

MR. WALLACE: Q: Okay, thank you. And why you're finding, I take it, very low utilization rates of CCGT plants over the last few years ago?

MR. LAUCKHART: A: Lower than you would expect, and they're a more balanced supply situation, that's correct.

MR. WALLACE: Q: Okay. And the articles I've been reading have figures in the 25 to 35 percent utilization factor in this period. Does that seem reasonable to you?

MR. LAUCKHART: A: It depends on the plant, depends on how much profit they're going to demand to run.

Proceeding Time 11:30 a.m. T36

Some of the plants will run a lot, but they're not

going to make very much money. Some of them will just not run at all. But on average you're probably seeing close to 50 percent capacity factor across the whole fleet.

MR. WALLACE: Q: Okay, and does that take into account that some of them are co-gen or have host contracts that force them to run?

MR. LAUCKHART: A: No, I'm talking about combined cycles that don't have steam host tier.

MR. WALLACE: Q: Okay, thank you. And Mr. O'Riley, if you were to use the alternate heat rate set out on slide 40 instead of the approach that was used under the QEM, would you agree that it would cut anticipated margins by a half to two-thirds?

MR. O'RILEY: A: I don't know the exact amount but it would substantially cut the margins, yes.

MR. WALLACE: Q: Okay, thank you. Now, slide 44 talks about implementation issues, and I guess the comment I'd like to get there is just the multiple -- well, the two of them. Multiple scenarios make project evaluation more challenging, particularly for a large number of alternatives. And is that the problem of having the seven choices you have set out earlier to try and decide what you're going to do for a project, or what's a meaningful outcome once you do it?

MR. O'RILEY: A: I wouldn't call them choices. I mean

it's just a -- I think this is just a fact that you have six electricity prices, and we try to use three exchange rates. You end up with a lot of scenarios to apply to a project or a decision, and that's just -- that generates a lot of information.

MR. WALLACE: Q: And the problem with the average of several scenarios can be effective for communicating high-level results but does not reflect actual uncertainty. And if we go back to I guess graph 38, is that the sense that there's quite a range of possibilities there, and that's not communicated by using an average?

MR. O'RILEY: A: Yeah, the idea is that you lose information. If you average your six price scenarios, you lose information.

MR. WALLACE: Q: Okay. I'd like to turn to your February 9th forecasting scenarios for approval. Now, clearly something happened between January 26th and February -- or January 27th, I guess, the original, and this. How did -- could you set the scene on this scenario for me?

MR. O'RILEY: A: I don't think a lot happened, actually, except some new slides were made, because there wasn't a lot of time to do more work in that time period.

MR. WALLACE: Q: Okay.

MR. O'RILEY: A: So I think what happened is we ran out of time at the January workshop. People wanted to see more detail of the alternatives that were considered in terms of this low heat rate, and so we came back with more detail and hoping to come to a conclusion.
MR. WALLACE: Q: Okay. And slide 2 sets out your objectives of obtaining approval for use of alternative heat scenario and price forecasting process. So that was your goal in this particular meeting?
MR. O'RILEY: A: Yes.
MR. WALLACE: Q: And slide 4, you have a description of the alternate heat rate scenario. I think it looks very much like the slide from the previous presentation.
MR. O'RILEY: A: I believe it's the same, yes.
MR. WALLACE: Q: Okay. And slide 5 you have market heat rates. You don't have the alternate scenario on that slide, and I guess it would be -- if it were there it'd be a flat line at 8.7?
MR. O'RILEY: A: Yeah, I think it comes up later, I think. But yes, we've switched to gigajoules to megawatt hours here, so -- gigajoules per megawatt hours, so.
MR. WALLACE: Q: Okay. And slides 6 to 10 you discuss different ways of calculating an alternative heat

ratio?

MR. O'RILEY: A: Yes, there's four options, I think, and this is the first option.

MR. WALLACE: Q: Okay. And I'm sorry, isn't -- I would have thought -- oh, slide 10 is the first option, that's right. And if you turn to option 4 -- I'm sorry, slide 10, option 4, that was the 8200 MMBtu per megawatt proposal that had been discussed at the previous meeting?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: Do I take it that the other three came out of a request that sort of was, well, alternative heat is something we should look at, but they didn't buy in immediately to the 8200 megawatt -- or, I'm sorry, MMBtu per megawatt?

Proceeding Time 11:35 a.m. T37

MR. O'RILEY: A: Well, I don't -- we didn't go back and come up with three other alternatives. I think this is just presenting the alternatives -- presenting another level of detail to the risk management committee that they didn't get in the first presentation. So, they're seeing the four alternatives that were considered.

MR. WALLACE: Q: Okay. And with respect to option 4, it states -- assumes the market method -- heat rate for 2003 continues, methodology for calculating the

electricity price does not depend on natural gas-fired generation. I take it that was seen as a positive of this option?

MR. O'RILEY: A: Yes, because we're trying to test a different relationship between gas and power prices.

MR. WALLACE: Q: Okay. And it stresses gas/electricity relationships and provides a low market heat rate, was another advantage of it?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And finally, it was considered defensible, the low market heat rate has existed for over two years?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And I think now we would say it had existed for three years?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And slide 11 is simply a graph putting some of the existing methodologies, and some option 1 and option 4 on the graph?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And section -- or slide 17, then, moving along, was the approval that was being sought at the meeting?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And it was to put option 4 forward as the best choice, being plausible, defensible and

meeting objectives?

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And was that approved?

MR. O'RILEY: A: No, it was not.

MR. WALLACE: Q: Okay. And what did happen? Because, maybe you can confirm for me, but when I look at the slides from February 26th, option four has disappeared.

MR. O'RILEY: A: Well, the concern was that this isn't a sustainable -- this 8200 is not a sustainable future, and the logic is that we're forecasting the load in the WECC to grow, there are unit retirements that are announced and expected, new resources are required. We -- there's a problem if that's the case, and market heat rates continue to be 8200, because people would be very reluctant to build generation in that environment. So we didn't see -- we saw it as too extreme a situation to have the -- a price so far below the long-run marginal cost for all time.

MR. WALLACE: Q: Well, whoever put the presentation of February 9th together didn't see it in that way, did they? They saw it as plausible, defensible, and meeting objectives. As one of your tests, not as the only test, but as one of your tests. Who was responsible for putting the presentation together?

MR. O'RILEY: A: Well, this was the staff, the price team staff.

MR. WALLACE: Q: Okay. And so the price team staff saw it as plausible, defensible, and meeting objectives.
MR. O'RILEY: A: Yes.
MR. WALLACE: Q: And I take it that the committee, and I'm sorry, I forget the name of which committee, overruled that recommendation?
MR. O'RILEY: A: The risk management committee is -- well, that's the committee. They had a different view.
MR. WALLACE: Q: Okay. And I mean -- well, you've confirmed it already, I don't need to go there.

And do you agree with me that in the February 26th presentation, then, option 4, alternative heat rate scenario, was gone?
MR. O'RILEY: A: Yes, and another change was made as well, in that we changed the relative weighting. So if you note -- go back to February -- or January 26th, we had four gas price scenarios, one method of converting from gas to electricity, and then over on the side we had, you know, this one alternative heat rate scenario. So although we've got a less conservative, if you will, heat rate scenario, we've increased the weighting here with the weighting of it in the process, by giving it effectively 50 percent weighting.
MR. WALLACE: Q: And so, you have a new heat rate, and

maybe we should go there, then. Slide, I guess 3, shows your new proposal that you would have a full recovery and a partial recovery with 50 percent rate in each.

Proceeding Time 11:40 a.m. T38

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And that -- let's see if there's another slide that -- the effect of that is under the full scenario, that CCGT, if it were to be modeled, would recover 100 percent of its fixed and variable costs?

MR. O'RILEY: A: Well, depending on the location and particular circumstances, but yes.

MR. WALLACE: Q: Okay. Essentially, given your model, as long as they're in the same spot, then it would recover 100 percent of its cost.

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And under the low scenario or the partial recovery scenario, it would recover 100 percent of variable costs and 25 percent of capital costs.

MR. O'RILEY: A: Well, it always recovers it variable costs because if it doesn't, it doesn't run. So in that scenario it ran at a lower utilization and recovered some of its fixed costs through the year.

MR. WALLACE: Q: But essentially the price would -- if

you generate the price through that model, you will always recovery enough to recover your variable costs and 25 percent of your fixed costs. So you're going to recover your variable costs all the time.

MR. O'RILEY: A: Well, you always recover your variable costs.

MR. WALLACE: Q: Yes, but you're going to have --

MR. O'RILEY: A: Just by definition, because you shut it down otherwise, right, so.

MR. WALLACE: Q: Yes, but if you set a price that is sufficient to cover your variable costs and 25 percent of your fixed costs, then you're going to have a high utilization because you're always going to be able to get some contribution to your fixed costs.

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: So you would run.

MR. O'RILEY: A: Well, what I -- the other change or the other -- as you pointed out earlier, there's no shape or profile to this price. It's just one price for a whole year. So we applied a profile from the Henwood model which causes some prices to be lower, prices at parts of the year to be lower, and prices at other times of year to be higher. So that's why you get a different utilization rate in this partial recovery scenario versus the 100 percent recovery scenario.

MR. WALLACE: Q: I understand that, but it only comes from shaping it. Your general assumption is that you will recover enough to recover your variable costs plus some of your fixed. So normally you will run unless shaping alters that slightly.

MR. O'RILEY: A: I guess I don't think we're seeing eye to eye on this.

MR. WALLACE: Q: Okay.

MR. O'RILEY: A: I mean you get a different utilization in the partial recovery, so --

MR. WALLACE: Q: Yeah.

MR. O'RILEY: A: If I got the same utilization in both cases, then I would agree with you. But there's a different utilization.

MR. WALLACE: Q: Okay, but the general assumption is, and I agree with you it may vary between March and November, but that you are going to recover sufficient that you will normally be running.

MR. O'RILEY: A: Yeah, I guess I can't really agree with you on that, be -- you'll run according to the utilization that we forecast. Whether that's normal I don't know.

MR. WALLACE: Q: Okay. And you have got rid of the alternative heat rate scenario option that was fully independent of gas. There is no independent test any longer.

MR. O'RILEY: A: Well, that was very much dependent on gas. It just, I mean, the electricity price was calculated by multiplying the gas by 8200. So it was independent of those -- so it was dependent, it was still dependent on gas.

MR. WALLACE: Q: Well, it was independent of CCGT conversion.

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: And one of its virtues, and I'm just looking to find the slide again, but one of its virtues was that it was independent of that conversion.

MR. O'RILEY: A: Yes, but you -- I mean, you asked me a different question, so --

MR. WALLACE: Q: Okay.

MR. O'RILEY: A: You can ask me a different question.

MR. WALLACE: Q: Why don't we leave it. I'll go with the slides later in argument. I think we've discussed that sufficiently.

Do you -- so this decision then was made at the Risk Management Committee level. The deletion of option 4 never reached the -- whatever it was, the Executive Committee, the higher level, or am I wrong?

MR. O'RILEY: A: No. Remember the Risk Management Committee is the Executive Committee.

MR. WALLACE: Q: Okay. So the decision that was made

here then was made at what level?
MR. O'RILEY: A: It was made at the executive level.
Proceeding Time 11:45 a.m. T39
MR. WALLACE: Q: Okay. To remove the option four.
MR. O'RILEY: A: Well, to choose the approach that we went with.
MR. WALLACE: Q: Okay. Thank you.
Dr. Pickel, I'd like to turn to your evidence now, if I could. You are a modeling expert, I take it? I don't know if that's the term you'd use to describe yourself, but --
MR. PICKEL: A: I'm an expert on using the modeling, not doing the modeling details.
MR. WALLACE: Q: Okay. You are not a market analyst, I take it?
MR. PICKEL: A: Only for 30 years.
MR. WALLACE: Q: Oh. Okay. So you do consider yourself a market analyst?
MR. PICKEL: A: Yes.
MR. WALLACE: Q: How would you distinguish between the type of market experience you have and Mr. Sheldon has, who obviously is very involved in it, and also calls himself a market analyst? In the types of things you do, so I can understand the different roles.
MR. PICKEL: A: Mr. Sheldon has set up several

exchanges, as I understand.

MR. SANDERSON: I think we mean Mr. Sheldon Fulton?

MR. WALLACE: Q: I'm sorry, sir, yes. Thank you. Mr. Sheldon Fulton.

MR. PICKEL: A: And I have purchased energy, both electricity and gas, I've sold electricity and gas in long-term markets, and in short-term markets. And I have evaluated both the commodity markets and worked on models to anticipate how those commodity markets might evolve.

MR. WALLACE: Q: Okay.

MR. PICKEL: A: In gas and electricity.

MR. WALLACE: Q: Thank you. Now, with any model, before one makes serious financial decisions based on its output, I would suggest to you the prudence says that you check the forecasting assumptions against the market, to see if they are reasonable.

MR. PICKEL: A: Yes, I believe I do that as a portion of my testimony.

MR. WALLACE: Q: Okay. And if a plant proponent didn't do that, in the case of a market plant, he wouldn't be able to get financing.

MR. PICKEL: A: Correct.

MR. WALLACE: Q: And these days, can proponents get financing based on models? Or do they need long-term contracts from parties like B.C. Hydro?

MR. PICKEL: A: Generally, with certain exceptional periods, you've always needed a form of a long-term contract. There were only a few merchant plants that were constructed without any contracts whatsoever.

MR. WALLACE: Q: Okay.

MR. PICKEL: A: Subject to check.

MR. WALLACE: Q: And where --

MR. LAUCKHART: A: If I might add that the financing arrangements that we continue to be involved in, even with a power purchase agreement, the banks want to see what might happen with the plant in a merchant market, because of the threat, and the reality, that sometimes the power purchase agreements get voided at some point, and they want to know what their exposures are. So they continue to want to look at merchant analysis when -- before they make their decisions to lend.

MR. WALLACE: Q: And by merchant analysis, you mean take a look at what the market has to say, besides what the model has to say? Test the assumptions against the market?

MR. LAUCKHART: A: No, I'm talking about looking at, for example, a plant that has a 20-year life for a loan that a bank is going to lend on, and have -- the bank wants to know how will that plant perform if it's a merchant market having to sell and they had spot markets. That's the analysis they want. It's an

analysis that's based on modeling. That's what we do.
MR. WALLACE: Q: Yeah. And all I'm saying is, when they look out there, they also want to look at what the principal assumptions -- how they compare to the data from the markets.
MR. PICKEL: A: Yes, but as we've stressed in our direct testimony, the market data, especially on electricity, is not liquid enough to make those sorts of evaluations beyond a few years.
MR. WALLACE: Q: Beyond how far?
MR. PICKEL: A: A few years.
MR. WALLACE: Q: A few years. And how far out do you take that?
MR. PICKEL: A: In electricity, two to three years. To stress, I believe, the definition that Mr. Sheldon Fulton used is a root definition of liquidity is if you use the market, will you affect the price.
MR. WALLACE: Q: Right.

Proceeding Time 11:50 a.m. T40

MR. PICKEL: A: If you looked out three years to 2008 and called up a broker and said, "Oh, I'd like to commit to 250 megawatts," he would have a moment of not knowing whether he went to heaven or hell, because he wouldn't know whether or not he could put that deal together and make a profit or be out of the trading business.

MR. WALLACE: Q: Well, I suggest to you that even 250 megawatts that far out, that if you did it over a period of time over a few weeks, you could easily put that out there on long-term.

MR. PICKEL: A: I don't agree with you.

MR. WALLACE: Q: If you put it into blocks?

MR. PICKEL: A: I don't agree with that. Not that far out.

MR. LAUCKHART: A: I might add that the banks do of course -- to the extent they might be taking over a project that exists today, or you know, they might be thinking about taking the keys and they want to do an analysis of what that means to them, then necessarily they need a forecast of the project starting today going forward, as opposed to this project which starts in, we believe, in 2008. But when they do that, they will look at both our -- they will get our model run and they will also get these futures that you're talking about. And not surprisingly, if everybody's doing things right, we get approximately the same answers, so.

MR. WALLACE: Q: And that's I'm getting at is, you do check one against the other, that you go out and you can -- in the same way Hydro can buy power for whatever, 50 -- or enter into a long-term contract under an EPA. You can go out and purchase power in

the long term, and you test that, you test your model results to see if they look like what people are willing to buy and sell for.

MR. LAUCKHART: A: Yes, so -- I mean there's a little bit of a different product. We're forecasting what the head prices will be for example in July 2007. The market you're talking about is you lock that up today and you don't wait till 2007. But in any event, there should be something close to those prices, and when we do our forecast, of course, we're making sure that -- in part the benchmark our models is to make sure that we're not real far away from those markets, and if we are, we need to dig down to figure out why that is.

But if you look for example on our curves on Exhibit 81A, you will see that, you know, we're building off those actual curves that are down there in 2002, 2003 and 2004. By 2008 when I start my model run, we haven't gotten that to rise very much, even though there is load growth, it's rising some.

So this is one measure of the fact that if someone would check how our fundamental base price forecasting compares to what these markets are, at least in the early terms, we seem to be consistent with them.

MR. WALLACE: Q: And I agree with you it's in the early terms, isn't it?

MR. LAUCKHART: A: Well, that's because in the long terms, as Mr. Pickel said, you can't find a market to compare it to.

MR. WALLACE: Q: Okay, and I'll leave that for argument.

I'd like to now turn to your model, Dr. Pickel. You state that electricity prices are an output, not an input, at paragraph 5 or question 5 of your evidence.

MR. PICKEL: A: Yes.

MR. WALLACE: Q: And the assumption I take it is that power price is based on the marginal cost of generation from a gas plant?

MR. PICKEL: A: First, we're estimating what are called locational marginal prices. It's actually locational marginal operating costs to receive power at that point. It's really a lower bound on price, because as Chris noted, you aren't going to generate if you're less than variable cost. Two, yes, that's what we're estimating.

MR. WALLACE: Q: Okay. When you say you're estimating the locational marginal operating cost, is that long-run or short-term, the variable?

MR. PICKEL: A: One hour.

MR. WALLACE: Q: Okay, so it's variable cost then. And your utilization rates also come -- are output from

the same model?
MR. PICKEL: A: Yes. What we're in effect doing is calculating an hour's supply and demand curve.
MR. WALLACE: Q: Okay, and won't your model usually result in high dispatch utilization for gas facilities, as long as the assumption is that the power price is based on the marginal cost of generation from a gas turbine?
MR. PICKEL: A: But that's an invalid assumption. Since load varies hour by hour, in periods of high hydro output and low load, you'll get into cold units on the margin.
MR. WALLACE: Q: Okay.
MR. PICKEL: A: And in periods of very high load, extreme weather, low hydro

Proceeding Time 11:55 a.m. T41

MR. PICKEL: A: And in periods of very high load extreme weather, low hydro conditions, you'll be going into our calculating costs of customer interruption at some point and you might be talking of hundreds of dollars per megawatt hour in that hour, although that happens only rarely.
MR. WALLACE: Q: Okay, but if your model assumes long-term that gas -- that the marginal cost of -- the marginal cost from gas determines the power price, then long-term aren't you going to have a higher

utilization of those facilities than if it was below gas price, or some other fuel was coming in.

MR. PICKEL: A: My model does not assume that -- necessarily that gas-fired combined cycles determine the price. It depends on the load in the specific hour. What we do make assumptions on are what units exist now and what units are being added and we line up those marginal operating costs in a supply curve in each hour in terms of which plants are available and then calculate where the demand curve or the existing load crosses that and determine a price and what are the marginal units at that point in time.

MR. WALLACE: Q: Okay. Now the factors that have been driving electricity price in the last few years, do I take it that you would – and you may have made the comment earlier – that you take the view that it is the marginal price of gas that's driven us to this heat rate of around 8200?

MR. PICKEL: Q: The result of the analysis, not the assumption of the analysis – excuse me, did I say that correctly? The result of the analysis, not the assumption, is that gas-fired units are on the margin in determining the locational, marginal price at most locations nearly all the time in the west.

MR. LAUCKHART: A: Was your question about what the model was doing or what the actual market was in

2002/2003?

MR. WALLACE: Q: If there's a distinction, could you clarify it for me?

MR. LAUCKHART: A: Sure. You know when we model, the best we can do is put in estimates of loads every hour. In the real world you have actual loads every hour, and across the whole WECC, for example. And you know, sometimes we try to do a back-cast and put the actual loads in there. But it's pretty hard to get actual loads on every hour, that actually occur. But the market is dealing with actual loads.

What I thought you were talking about is the 88,000 heat rate that we're showing as actual in '82, '83, '84 in the data here as opposed to what our model might have done by putting some numbers in. And the point there is that we believe gas is still pretty much on the margin. Even in those actual periods gas plants are running some of the time and that's why that price is that level, because if it was hydro only, hydro on hydro competition, it would have been what we call a market heat rate well below 8200.

MR. WALLACE: Q: Okay. Can we take it the low utilization rates that you and I spoke about earlier, gas can't set the price on the margin if it's not running and so utilization rates are an indication of when gas is setting the price?

MR. LAUCKHART: A: It is but because -- if you have 40,000 megawatts of gas-fired generation and you only need 20,000, you're going to get a utilization rate of 50 percent, but that 20,000 is still gas that's running on all these hours.

MR. O'RILEY: A: I mean a really good example to show that the role of gas plays in electricity prices, you can see in the years 2002, 3 and 4, the heat rate for those years was virtually the same. It was between 8.1 and 8.3. The gas price in 2002 was only 268. This year it was 518. So obviously gas is -- the heat rate's almost constant and that's based on the stock of the fleet of existing generation that -- the gas price is a flow through.

MR. WALLACE: Okay, thank you. Mr. Chairman, this is probably a convenient time to take the lunch break.

THE CHAIRPERSON: Unless there are any objections, I think we will adjourn now until 1:30 and I'm hesitating only because if there's a preference for a shorter lunch hour today I'll entertain that request.

MR. WALLACE: I think I will be able to complete quite easily so that we will finish. There is no risk we won't finish within the normal time.

THE CHAIRPERSON: Let's take the usual break then. We'll break until 1:30.

(PROCEEDINGS ADJOURNED AT 12:00 P.M.)

(PROCEEDINGS RESUMED AT 1:30 P.M.) **T42**

THE CHAIRPERSON: Please be seated.

Mr. Sanderson.

MR. SANDERSON: Mr. Chairman, Mr. Wallace has graciously allowed me to address a couple of questions to this panel that I think it will be more convenient to do while he's still up than wait for him to sit down and then bring him back.

And that is, Mr. Wallace asked you this morning, Mr. O'Riley, whether you could confirm, subject to check, the 91 percent -- that 91 percent of the energy margin was earned on the analysis that Hydro had done from the Duke Point energy sales, after 2013, I think was the question. Have you had an opportunity to check that number?

MR. O'RILEY: A: I understand that number is -- represents a non-discounted number, and we're endeavouring to confirm the exact number, hopefully this afternoon.

MR. SANDERSON: All right. And Mr. Chairman, I wanted to do that now, because if we don't get the opportunity to get that done before Mr. Wallace is finished, it would be our proposal to file that number in writing.

MR. WALLACE: Q: That would be fine. And just so I don't -- I take it the 91 percent isn't inexact, it's

just not net present valued.
MR. O'RILEY: A: Well, we'll confirm the exact number.
MR. WALLACE: Q: Okay. In both cases --
MR. O'RILEY: A: Yes.
MR. WALLACE: Q: -- you're going to give a full value and a non -- or a non-discounted and a discounted value.
MR. O'RILEY: A: Well, we're going to provide our view of the number, which is a discounted number.
MR. WALLACE: Q: Well -- yes. But I asked you to confirm the 91 percent as a non-discounted number, and I would like that -- that was the number I put to you.
MR. O'RILEY: A: Okay.
MR. WALLACE: Q: If you want to give a discounted number in addition, I'm fine with that.
MR. O'RILEY: A: Okay.
MR. SANDERSON: We'll do that.

The second is just to give Mr. O'Riley an opportunity to clarify one response he gave to Mr. Wallace, and that was, you identified the members you thought -- of the team that are identified on the pricing forecast issue at, I think it's slide 6 in the first presentation. And Mr. Wallace had asked you which ones of those are part of the CFT team.

Have you had a chance to check that over lunch?

Proceeding Time 1:32 p.m. T43

MR. O'RILEY: A: I did.

MR. SANDERSON: Q: Could you just describe the results of your check?

MR. O'RILEY: A: Okay. Just to clarify that Mr. Rich did not have any substantial involvement in the CFT except for the -- until the development of the application this fall.

CROSS-EXAMINATION BY MR. WALLACE (Continued):

MR. WALLACE: Q: Dr. Pickel, could you turn to page 8 of your evidence.

MR. PICKEL: A: Yes.

MR. WALLACE: Q: And I see there the capacity mix for January 1st, 2004, and that has combined cycle at 14.5 percent?

MR. PICKEL: A: Actually you would best look at the corrected version of that table, which is B-97.

MR. WALLACE: Q: Thank you. And that would make it 14.3 percent?

MR. PICKEL: A: Yes.

MR. WALLACE: Q: Thank you.

MR. PICKEL: A: And would you agree that burning of fossil fuels in the WECC is literally an economic last resort?

MR. WALLACE: Q: Yes, but it's all the time.

MR. PICKEL: A: Sorry, what do you mean by --

MR. WALLACE: Q: Fossil fuels are on the margin and thus being burned virtually all the time in the WECC. Coal, even when gas is not on the margin, steam turbine coal units are on the margin. There was only the rare hour when hydro or a non-fossil fuel is on the margin.

MR. PICKEL: A: Okay, but one attempts -- one burns a fossil fuel only as a last resort. You'd use every other fuel in the Pacific Northwest first.

MR. WALLACE: Q: I believe I have considered cases where refuse-derived fuel might be more expensive, or some waste fuels are sometimes more expensive and would be dispatched at a higher cost than coal because they're higher O&M cost.

Proceeding Time 1:35 p.m. T45

MR. WALLACE: Q: Okay, but -- well, maybe I'm going to put something to you, sir.

Actually, I'll give it to Mr. Sanderson and the witness first, and then --

Sir, I've provided you with an excerpt from an article called "The Western Energy Market: Inherent Risks and Market Solutions" by Jeffrey D. Roark with sidebar information by Frederick H. Pickel, Ph.D. Do you recognize that article?

MR. PICKEL: A: Yes.

MR. WALLACE: Q: And the Dr. Pickel that they refer to

is yourself?

MR. PICKEL: A: That is -- it is I.

MR. WALLACE: Q: Okay. And are -- and you have had an opportunity to -- well, maybe -- can we have it marked as an exhibit at this point, Mr. Chairman?

MR. SANDERSON: C19-26.

MR. WALLACE: C19-26.

THE HEARING OFFICER: C19-26.

(EXCERPT FROM ARTICLE ENTITLED "THE WESTERN ENERGY MARKET: INHERENT RISKS AND MARKET SOLUTIONS" BY J.D. ROARK WITH SIDEBAR INFORMATION BY F.H. PICKEL, PH.D., MARKED AS EXHIBIT C19-26)

MR. SANDERSON: Just for the record, (inaudible) someone else's, maybe either Mr. Wallace could or he could ask Dr. Pickel to describe just when this document was authored and what it is.

MR. WALLACE: Q: Dr. Pickel, if you could do that.

MR. PICKEL: A: This is a general article by Jeffrey Roark, who's now with TVA, on the risks inherent in the western energy market, meaning the WECC, and what I did in that sidebar was to characterize the risks associated with hydro for the overall WECC market. And I think this is an important graphic for the purposes of this discussion, because all of the analyses here have assumed an average hydro year as depicted in this chart by roughly 250,000 gigawatt

hours of hydro per year. And what generates very high value for power -- or very high prices for power, and also very high prices -- or very high net margins on thermal units, is in dry hydro years, particularly like 2001, where that energy that would have been produced by hydro is produced from, typically, natural gas fired units. And typically, even the most expensive natural gas fired units.

My analysis didn't address that uncertainty at this point, but I would like to stress there's an asymmetry in the value of energy projects, especially gas-fired projects. You pay the capital cost, but they're worth a fortune in years like 2001, as illustrated by, I believe it's Exhibit 81A, that shows that very high spike in market heat rate. We're seeing that very high spike in market heat rate largely because of a very dry hydro year.

MR. WALLACE: Q: Thank you. And at the top of that page that's produced there is an article which -- or is a paragraph which describes the manner in which trading takes place in very general terms in the WECC. And toward the end of the paragraph, it says:

> "When all the trading is done, the coal plants in the West are often still scheduled to run almost “flat out,” but the gas plants are lined up to “swing.” That is, they run

only enough to satisfy the next day's energy and reliability needs. Economically, this is exactly what should happen."

And do you agree that describes the situation?

MR. PICKEL: A: Yes. But they do run, or there are some gas- and oil-fired units on the margin all the time. But I'd also like to point out your general question was, when do fossil plants run? And in fossil I include coal.

MR. WALLACE: Q: And -- okay. Thank you. But you would agree with this statement in the paragraph that says:

"Among fossil fuels, a coal plant is generally less expensive to run than a gas plant, so coal plants generally run as much as they can practically run."

MR. PICKEL: A: Yes.

MR. WALLACE: Q: And you agree

"Gas- and oil-fired generators are truly the last generators in line; they usually generate what is needed after all other generator types have done all they can do."

Proceeding Time 1:40 p.m. T45

MR. PICKEL: A: Yes, and this represents costs on a variable operating cost basis, exactly in the form being simulated by our GE Maps analysis and Henwood's

analysis.

MR. WALLACE: Q: What does your model have in it for new coal and oil sands generation in Alberta?

MR. PICKEL: A: We assume that there will be 90 megawatts of wind added in 2004 in Alberta. The Genesee coal plant of 500 megawatts will be added in 2005. The Keephills coal unit of 450 megawatts will be added in 2007. And as you will note, we specify or don't put specific units into our order of plants going online unless specific construction plans have been announced. And typically we wait for either financing or construction to begin.

Beyond those units, for purposes of capacity balance, we add 750 megawatts of generic units in 2011 and '12, 500 megawatts of combined cycle, and 250 megawatts of gas turbine that could represent the addition -- remember we're doing this on a variable operating cost basis; of a portion of the proposed but not yet in construction cogeneration units.

MR. WALLACE: Q: Okay, thank you. But the economics of proposed oil sands generation would be very different than a standalone combined cycle?

MR. PICKEL: A: Not really. As I believe I testified in the VIGP hearings, cogeneration as typically implemented involves a combined cycle producing steam

off the waste heat generator. If you look at the value of the product coming off the combined cycle, it's a lot like elephant and rabbit stew. The one elephant, one rabbit, and most value is the power provided, they can get the power to market. The question with as many megawatts as they're proposing for Alberta, there are investments far beyond the scope of the generator that are needed to get that power to market.

MR. WALLACE: Q: Well, I understand that, but I also understand the additional cost of doing it in the oil sands is not that high, and it becomes must-run generation once it's there. Would you concur?

MR. PICKEL: A: I have not studied the specifics of those generators.

MR. WALLACE: Q: Thank you.

Now getting back to the relationship between gas price and the combined cycle gas turbine, would you agree that the post-2113 assumption in the full case, and I qualify this, is in the full case that the gas price will drive the elecftricity price to a level that recovers all costs?

MR. PICKEL: A: I'm not sure I understand your question. Could you state it again?

MR. WALLACE: Q: Yes. In the post-13 scenario under the QEM full case assumption, the assumption is that

the gas price will drive the electricity price to a level that recovers capital and variable costs.

MR. PICKEL: A: That's in the full recovery case.

MR. WALLACE: Q: Yes. And it will essentially do that 100 percent of the time in the full case.

MR. PICKEL: A: I believe -- I would disagree with the use of the phrase "all the time". I would agree that it covers the full cost in every year but not in every hour.

MR. WALLACE: Q: Okay. Well, on the way the model runs, it is every hour except when it's not running for maintenance or I think the 3 percent uncertainty.

MR. O'RILEY: A: I'm not sure that's the case. I don't think -- we're assuming 91.3 percent. I don't think the rest of the hours are assumed to be maintenance.

MR. WALLACE: Q: Okay, well, we can take a look at the model, I guess, to determine that and we'll save it for argument. But accepting your 91 percent, you would agree then that the assumption is that in that folk scenario, that the gas price CCGT will drive electricity price to a level that recovers capital and variable costs that 91 percent of the time?

Proceeding Time 1:46 p.m. T46

MR. O'RILEY: A: Yes, I can answer that yes.

MR. WALLACE: Q: Okay, thank you. Now, gas clearly did not drive electricity prices to that level in the last

three years, did it?
MR. O'RILEY: A: Well --
MR. WALLACE: Q: On a regular basis. On that -- anywhere near that sort of basis.
MR. O'RILEY: A: The heat rate did not reflect that full cost recovery in the last three years.
MR. WALLACE: Q: Yeah.
MR. O'RILEY: A: Gas was certainly on the margin the last three years, and I think you see that between a relationship between gas and power.
MR. WALLACE: Q: No, but I'm going to the assumption you have in the full case, now. I'm getting away from the variable alone, to the assumption you're using to drive your full case from 2013 out to the end of the test period. And I'm suggesting to you that gas price did not drive electricity prices in that manner in the last three years.
MR. O'RILEY: A: Yeah, the only -- I would say that the supply/demand balance, the mix of generation resources and load, did not result in heat rates in the last three years like we're forecasting from 2013 and beyond in our 100 percent recovery case. I don't -- I think where we're disagreeing is that gas is doing something -- it's not gas doing something, it's the fleet of resources and the intermixing between that and the load.

MR. WALLACE: Q: No, but the assumption in your model from 2013 out is simply that gas prices, they're the only variable you're using, drive that CCGT which drives the electricity price to the level that will recover the gas -- or will recover the full fixed and variable costs.

MR. O'RILEY: A: Yeah, the other variable that you don't see there is the assumption around the mix of generation in the market in the larger region.

MR. WALLACE: Q: Yeah, and that variable's not in your model, the QEM model, is it?

MR. O'RILEY: A: Well, it is. It's implicitly there, and what we're saying with this long-term -- this long-run marginal cost is, we're not saying it's going to be the flat line from 2013 on, what we're saying is that the market needs new generation over time to meet load and meet retirements. We forecast that to be gas-fired generation. That generation will only come in if there's an expectation that people can reasonably recover their energy margin.

So if there's periods where they don't recover it, new additions will lag, and we'll see a tightening in the market and we'll see periods where the heat rate is actually above what we're seeing. And we'll expect to see a cycle, some periods with heat rates lower, some periods where it's above. Over

time, we're expecting it to roughly equal the long-run marginal cost. And that is supported by our more detailed analysis that we've done using the Henwood model, and just in case this doesn't happen, we've got this other scenario, which we're weighting 50 percent, that tests that relationship and that's called the 25 percent recovery case.

MR. WALLACE: Q: Yeah, and I understand you've got another case. What I was trying to talk about is your full scenario case, and your full scenario case, you don't have any of those other factors there that sometimes you're higher, sometimes you're lower, you have a gas turbine that converts electricity in a manner that recovers the full fixed and variable cost. Right?

MR. O'RILEY: A: The other factors are taken in in the determination of that scenario. I don't want to repeat myself, but --

MR. WALLACE: Q: Yeah. Okay. And I suggest -- so clearly, gas prices did not drive electricity prices in the manner assumed in the full case in the last three years, did they?

MR. O'RILEY: A: And what I'll just say there, it's not gas prices, it's the mix of supply and demand in the market, in the last three years, was such that there's excess capacity in the market. That resulted in a low

relationship between electricity and gas prices. Gas prices are somewhat irrelevant to the discussion.

MR. WALLACE: Q: Well, they aren't irrelevant to your model. Your model turns gas prices into electricity prices.

MR. O'RILEY: A: Yes. But that's not --

MR. WALLACE: Q: Then on your -- and they didn't --

MR. O'RILEY: A: Okay. Yeah. I mean, in the last three years, it's not that gas prices aren't driving an electricity price such that generators receive full recovery. What's happening in the market, and looking at market fundamentals, is there's a lot of excess gas-fired generation. And we've got charts that show how much came on line in the different years, and there's a tremendous glut of energy generating capability in the market.

Proceeding Time 1:50 p.m. T47

So it's that glut of generation capability that's resulting in low heat rates the last three years. And those market prices have occurred in a relatively low gas price environment in 2002 when the price was 278, and they've occurred in a relatively high gas price environment where the price was over $5.00. So it's not the gas price that's driving anything, it's the mix of generation assets in the fleet and the balance between supply and demand.

What we're saying is that over the time, we don't see that supply and demand picture remaining constant. We see a tightening of that supply and demand balance, and resulting in that, the higher market heat rates.

MR. PICKEL: A: And in part, this assumes that we're perfectly good at our timing. If we're late, we end up with the kind of spike we saw in 2000-2001, and that it can be compounded, as shown in your additional handout, by a dry hydro year, and then we have a spike so high these plants may pay for themselves in one or two years.

MR. WALLACE: Q: Okay, I think rather than continue, Mr. O'Riley, I'm going to give one last try at this. Would you agree that there is no correlation between the results of your model 2013 and on, and what has been experienced in the last three years? Simply you take the view that was then and this is going to be what the future is.

MR. O'RILEY: A: We include the possibility of conditions like we've seen in the past occurring through our 25 percent recovery scenario.

MR. WALLACE: Q: Okay, but there is no correlation between your full scenario and what happened in the last three years.

MR. O'RILEY: A: The full scenario assumes that

different supply and demand conditions will be in play.

MR. WALLACE: Q: Okay. Now Dr. Pickel, coming to you, you've talked about the spike 2000-2001 a couple of times. Would you agree with me that gas prices were not driving electricity prices at that time? During the spike, and I realize there were different conditions during that period.

MR. PICKEL: A: No, I would not. Electricity and gas prices were in fact both being bid up during that time period. The shortage of electricity in the western market meant that the missing hydro and increased demand had to be met by incremental gas-fired generation. We were reaching the limits of the gas-fired generation at the same time we were near the limit of the western pipeline system to move gas into the west, to serve those generators.

MR. WALLACE: Q: Well, I understand it could be a shortage of hydro, it could be a shortage of gas. But my question to you was, was it driven -- was that spike driven by gas prices?

MR. PICKEL: A: The spike was driven by several factors. I would say the electricity market was driving gas prices up more than gas prices were driving power up. Power was driven up by a shortage of electric energy in the western U.S. and Canada.

MR. WALLACE: Q: Okay. Sir, before I produce an exhibit to you, and I'll tell you what it is, it's an excerpt from your evidence on behalf of Powerex before FERC, I suggest to you that in that evidence you indicated five drivers of the price crisis, elefctricity price crisis, and not one of them was gas price.

MR. PICKEL: A: No, that's not quite correct. If you hand me a copy of that testimony I will be able to show you where that's discussed.

That's not a complete copy of the testimony.

MR. WALLACE: Q: No, I'm trying to give you a complete copy. It's the summary of -- what I have provided you is the first page in the conclusion, and I have got a full copy and if you want I will provide it to you.

MR. PICKEL: A: Yes, please.

MR. WALLACE: Q: But I suggest -- I can do that right now.

Just first, do you recognize this as excerpts from your evidence in the FERC proceeding on behalf of Powerex?

MR. PICKEL: A: I'm sorry, could you repeat the question, please?

Proceeding Time 1:55 p.m. T48

MR. WALLACE: Q: Sure. Do you recognize this as an

excerpt from your prepared testimony on behalf of Powerex before FERC?

MR. PICKEL: A: Yes I do.

MR. WALLACE: Q: And would you agree with me that on the page in which you set out your summary of what you're going to state, that you refer to a number of items, and I'll list them here: scale of hydro energy shortage as a primary driver for the energy shortfall, compounded by gas supply, air quality constraints, increases in overall electricity demand, credit problems created for qualifying facility generators, and nuclear outages, as the drivers that you were going to discuss?

MR. PICKEL: A: Yes.

MR. WALLACE: Q: Thank you. Now, Mr. Chairman, I guess in that case I would like to have that marked. Well, actually, it's not necessary.

MR. PICKEL: A: But really, the whole exhibit should go in, because it should point out that the system was brought into balance by the increase in gas-fired generation combined with demand response, and part of the restriction on the ability to -- of the original system as configured to respond was constrained by pipeline adequacy into the region and the ability of the QS, many of whom relied on natural gas, to respond when their credit had disappeared because they weren't

being paid for their power. So they could no longer buy gas. So gas was integral to this problem.

MR. WALLACE: Q: I understand gas was integral, but I didn't hear gas price being integral.

MR. PICKEL: A: Well, the two come together.

MR. WALLACE: Q: Okay.

Mr. Chairman, I'm content to mark the entire exhibit or nothing. If Dr. Pickel thinks that the sufficient is on the record now, I'm happy with that.

MR. SANDERSON: Well, it sounds to me like, in the interest of the record and in fairness to the totality of the testimony, I can't make head or tail of just the first page, so it seems to me the whole exhibit should go in.

MR. PICKEL: A: The -- from my perspective, the whole exhibit should go in. In particular, I would like to suggest the Commission look at two attachments. The first figure and first table, PWX-3 and PWX-4, in the exhibits to the attachment. Because it describes the development of the shortage and how it was solved, in part, by the addition of new generation, largely gas-fired.

MR. WALLACE: Okay, Mr. Chairman, we will make copies of that available, if we could assign the next number.

MR. FULTON: C19-27.

MR. WALLACE: C19-27.

THE HEARING OFFICER: C19-27.

(PREPARED TESTIMONY OF F.H. PICKET ON BEHALF OF POWEREX CORP BEFORE FERC, MARKED AS EXHIBIT C19-27)

MR. WALLACE: Q: Okay. Dr. Pickel, I'd like you to turn to your question 22, and you indicate there you're discussing -- comparing your testimony here with what testimony you previously submitted on VIGP in June, 2003. And you indicate that -- at the bottom, at line 30 --

> "The result is that LMP prices for 2008/2012 for many major utilities in the southwestern United States have decreased 30 to 45 percent, versus the 2003 analysis."

Is that correct?

MR. PICKEL: A: Yes.

MR. WALLACE: Q: And simply put -- and also you indicate the gas prices have gone up?

MR. PICKEL: A: No, their gas prices have gone, and what's important is they've gone down relative to the rest of the WECC. Pipeline capacity has been added into that part of the region, and the basis differential, comparing southern California, the centre of a lot of the older gas-fired generation, and Sumas, has decreased, quite substantially, by 88 percent.

MR. WALLACE: Q: Okay. That was maybe what I misunderstood about your evidence, then.

Proceeding Time 2:00 p.m. T1A

MR. PICKEL: A: And that is in fact the most important driver of the difference.

MR. WALLACE: Q: Okay. I'd like to turn to question 23 and you state at line 23:

> "Our analysis shows that locational electricity prices at Duke Point consistently average above those at mid-C."

Do you see that?

MR. PICKEL: A: Yes, and that's on an annual average basis.

MR. WALLACE: Q: Okay. And what are locational electricity prices at Duke Point? Is that the cost of --

MR. PICKEL: A: Those are estimates of the locational marginal cost.

MR. WALLACE: Q: And is that --

MR. PICKEL: A: It's the variable operating cost to receive more power or the value -- the cost reduction value of putting more power in at a location at a plus at Duke Point.

MR. WALLACE: Q: Is that then the cost of the Duke Point plant or the Duke Point EPA?

MR. PICKEL: A: No, it's a lower bound on the value.

MR. WALLACE: Q: How is that? What did you use for a cost at Duke Point to generate a locational electricity price?
MR. PICKEL: A: You can look at the relative value of adding in a megawatt hour or taking out a megawatt hour, in any hour in terms of where that supply may be source, or where it may go if it's generated at Duke Point. And this reflects marginal fuel costs and variable O&M, and it doesn't included fixed O&M and it doesn't include implied capacity value.
MR. WALLACE: Q: So is it marginal fuel cost for a CCGT and marginal -- or variable O&M for a CCGT?
MR. PICKEL: A: No, it's the marginal cost of whatever you could pull on in the entire WECC, reflecting losses and transmission constraints to bring it to that point or take it out of that point.
MR. WALLACE: Q: Okay, but what does that really translate to in your model? What were you using -- would that be a CCGT because they're at the margin all the time?
MR. PICKEL: A: It depends on which hour.
MR. WALLACE: Q: Okay. For your conclusion that locational energy prices consistently average above those at mid-C -- and I note the word "consistently". Are we using a CCGT?
MR. PICKEL: A: It's an annual average across all

hours. Some hours it might be coal supply. There might be a few extreme hours where it is variable hydro somewhere else in the region. It could be in some hours a gas turbine unit.

MR. WALLACE: Q: And it could be located anywhere in the system too.

MR. PICKEL: A: Correct, but most likely it is located in southern B.C. or Washington or Oregon.

MR. WALLACE: Q: And your model, unlike Mr. Lauckhart's as I understand it, then has nodes at Duke Point also?

MR. PICKEL: A: Yes.

MR. WALLACE: Q: And does this -- I guess I'm having trouble with the concept even. So this isn't a facility regularly at Duke Point?

MR. PICKEL: A: Well, we model a plant equivalent to the proposed Duke Point unit by placing it at Duke Point. But there will be hours where the price at Duke Point is not determined by the Duke Point unit.

MR. WALLACE: Q: Okay.

MR. PICKEL: A: Especially since Vancouver Island is an overall importer of power in every hour that I checked, and which means the price at that point is not being determined by the Duke Point plant but it's being determined by supplies elsewhere.

MR. WALLACE: Q: Okay, but you modeled that by placing a plant at Duke Point, you said?

MR. PICKEL: A: We placed a plant at Duke Point in the model, but we looked at the dispatch of the region considering the transmission constraints. And the price at that bus was reflective of whatever the marginal source of supply might be to deliver power at that buss.

MR. WALLACE: Q: Okay, but let me step back for a minute. So you modeled it by placing a plant at Duke Point, and then you dispatched that plant according to the prices in the region?

MR. PICKEL: A: Throughout the WECC.

MR. WALLACE: Q: Okay. And the plant that you placed at Duke Point was a, let me guess, a CCGT?

Proceeding Time 2:05 p.m. T02A

MR. PICKEL: A: Yes. Of -- with a heat rate of 6986.

MR. WALLACE: Q: Okay.

MR. PICKEL: A: And 252 megawatts.

MR. WALLACE: Q: And so I take it, then, that what you're saying there is that that modeled plant showed locational prices consistently above those at mid-C.

MR. PICKEL: A: On an annual average basis.

MR. WALLACE: Q: Thank you. Like to turn to Appendix 3 of your evidence. And you show utilizations highest in the -- when I look at it in the months 4 and 5. And do I take that that that's April and May?

MR. PICKEL: A: Yes.

MR. WALLACE: Q: And I was curious about that, because I thought those were high run-off months, and that that would be counter-intuitive to price cycles we see in these markets.

MR. PICKEL: A: It's likely those high capacity factors are due to maintenance outages by plants elsewhere in the region. If you look at the traditional hydreal flood month, of June, you'll see a low capacity factor.

MR. WALLACE: Q: Okay. Thank you.

Mr. Lauckhart, I'd like to turn to your evidence, page 9. And there you show installed capacity by fuel type for 2008 and you have natural gas forming 41 percent of the capacity?

MR. LAUCKHART: A: Yes.

MR. WALLACE: Q: And the output of those natural gas plants is 28 percent of the energy? Or generation?

MR. LAUCKHART: A: As we look -- dispatch them under normal conditions in 2008, that's what we arrived at.

MR. WALLACE: Q: Okay. And when I calculated a utilization factor based on that amount of generation over what would be capable from that amount of capacity, I came to a utilization of 35 percent. Would that seem correct to you?

MR. LAUCKHART: A: I'm hesitating here, because I did the calculation off the numbers below there, and came

up with 52 percent in 2008.

MR. WALLACE: Q: Well, that's for combined cycle, and I will come to that set below also.

MR. LAUCKHART: A: Okay. So you're saying simple cycle, ignoring that table.

MR. WALLACE: Q: A simple one, for the top, natural gas, I got a utilization of 35 percent.

MR. LAUCKHART: A: That's -- I'll accept that, subject to check.

MR. WALLACE: Q: Okay, thank you. And you're saving me some time here on the next table, when I looked at combined cycle for 2008, capacity and generation for combined cycle, I found a load factor -- or a utilization factor of 52 percent, and you would agree?

MR. LAUCKHART: A: Yes.

MR. WALLACE: Q: And, Dr. Pickel, turning to you, in your table, in your evidence, you have a utilization factor of 78 percent for 2008?

MR. PICKEL: A: In my base case, in which, on page 10--

MR. WALLACE: Q: Yes.

MR. PICKEL: A: -- I had a -- using NYMEX prices, I had a capacity factor, to use the proper -- the industry term, is 77.4 percent.

MR. WALLACE: Q: Okay. And that's significantly different than Mr. Lauckhart's.

MR. LAUCKHART: A: Well, that -- I think you're getting

a couple of things mixed up here. When you calculated the 52 percent, that was over a fleet of 36,000 megawatts. It's not my forecast of what the Vancouver Island project would do. I think you were talking to Mr. Pickel about what he thinks the Vancouver Island project would do.

MR. WALLACE: Q: Okay.

MR. LAUCKHART: A: You could turn to my table on page 14 and see that in 2008, while the fleet across WECC is doing 52 percent, I've got the Vancouver Island project doing 77 and a half percent.

MR. WALLACE: Q: And why is that?

MR. LAUCKHART: A: Well, a number of reasons, but I'll just give you an example here. There has been an enormous amount of gas generation built around Palo Verde in Arizona. It's bottled up with no transmission to get it out. There's huge congestion in that part of the WECC, and so that generation won't really run nearly as much as some of the other generation, and a lot of the new fleet that's been built in WECC has been in the south. So somebody who's in the north would have some kind of an advantage, and then also there's the basis differentials on fuel prices.

Proceeding Time 2:10 p.m. T3A

MR. WALLACE: Q: Okay. Now, I did want to come to that

table of yours. If I can just -- yes. We're now at page 14. We're talking about your base case. Is that the same case that drove your assumptions that are found on page 9?

MR. LAUCKHART: A: Well if you recall, the Henwood approach to modelling is slightly different than the GE Maps approach. We run two separate analysis. One is a price formation analysis and we get prices across the west. And then we in a separate model dispatch a specific unit against those prices. And what you -- page 9 is the database that goes into the price formation analysis.

MR. WALLACE: Q: Right.

MR. LAUCKHART: A: Page 14 is the result of dispatching the EPA against these market clearing prices, similar to what was done in the CEQM or QEM.

MR. WALLACE: Q: Well, that's what I come to. So page 9 first is what you project -- you project your prices and then look at the dispatch. And it's not the same exercise that is happening at page 14.

MR. LAUCKHART: A: Right, the price formation analysis is a global analysis. The asset evaluation is focused on the asset.

MR. WALLACE: Q: Okay. And on page 14, on the table you have there, you're running a base case, or what you call a base case, for this plant.

MR. LAUCKHART: A: Right, and when I talk about base case, I'm talking about every hour of the forecast period conditions are normal. Hydro is normal, there isn't abnormal temperatures, you've got the normal pattern of loads, you've got forced outage conditions that are normal, gas prices are what we call central tendency gases instead of gas prices that are swinging caused by weather events.

And then of course we know -- a couple of things can happen. We know that, well, there might be an overbuild or an underbuild, and I've kind of assumed that we just transitioned to a nice smooth in this case. It's a little hard to predict the overbuild and underbuild. We also know that weather can have a significant impact on dispatch of this kind of a unit. And the beauty about weather is you can quantify the uncertainty there, and it's that quantification that I tried to do in 2012 to show you weather-related uncertainties and what it might do to the dispatch and the profitability of the plant.

MR. WALLACE: Q: Okay, where did you gas and electricity prices come from for this run?

MR. LAUCKHART: A: For this run I used Henwood Fall 2004 reference case that we provide to all of our clients. It's our independent assessment. And then I substituted for my gas price a gas price that I got

from B.C. Hydro, and re-ran that model to get an electricity price and of course the gas price that was provided. That's how I developed the spot market electricity prices, and that's where I got the gas prices in the region.

And then for the portfolio model, I put the gas price in that the EPA would experience consistent with that portion of the region, that that gas price in my price formation model, and I put the electricity prices in that I got for the B.C. area. And then I dispatched the unit against those prices with those gas assumptions.

MR. WALLACE: Q: Sorry, if I can simplify this because I am not quite sure I got it; is the electricity price you used the EIA forecast that Hydro used in its model?

MR. O'RILEY: A: Excuse me, Hydro didn't use the EIA electricity forecast model.

MR. WALLACE: Q: No, I'm sorry, gas price.

MR. O'RILEY: A: Yes.

MR. WALLACE: Q: I misspoke myself. Is the gas price the EIA gas price?

MR. LAUCKHART: A: Yes, it is. In B.C., since the EIA was not -- didn't give us basis differentials for across the west, B.C. Hydro provided me not only a Henry Hub but basis differentials.

MR. WALLACE: Q: Okay. And then you ran it through your model, and that turned out an electricity price.
MR. LAUCKHART: A: Yes.
MR. WALLACE: Q: And essentially do I take it that in running that gas price through your model, it got converted to electricity price using a CCGT?
MR. LAUCKHART: A: No, it did not.
MR. WALLACE: Q: Okay. Can you explain?
MR. LAUCKHART: A: Well, my testimony describes it a little bit and I mentioned it before but I'll go through it again. Our model is an hourly supply balance, and so every hour in the WECC, across the whole WECC we have loads. And then we're saying, okay, if those are the loads we have to meet on this hour, what resources across WECC do we have to meet them? And what is their -- what are they going to bid into that market, the people who have those resources?

Proceeding Time 2:15 p.m. T04A

And of course, at the end of the day, it's only the unit that's on the margin, then, it's bid, that becomes important. But we find the unit that's on the margin, and it's a more complicated, as I describe in my testimony, but we find the unit that's on the margin on every single hour. That sets the market clearing price at that hour.
MR. WALLACE: Q: And when gas is on the margin, then it

is converted using a CCGT.

MR. LAUCKHART: A: No, so let's say I -- let's say there's three units -- let's say there are three gas-fired units in WECC. There's a unit with a 7,000 heat rate, there's a unit with a 10,000 heat rate, and there's a unit with a 14,000 heat rate.

MR. WALLACE: Q: Right.

MR. LAUCKHART: A: I'm going to say gas is on the margin. Whether either -- no matter which of those three units is operating, I'm saying gas is on the margin. But it's going to be a different market clearing price if the marginal one is the 7,000 heat rate than it will be if it's one that's a 10,000 heat or the 14,000. So let's say the load is very high on some hour. We'd need all the 7,000 heat rate unit, we'd need all the 10,000 heat rate unit, and now we're using some of the 14,000 heat rate unit. It's gas, in that hour at a 14,000 heat rate that sets the market clearing price.

MR. WALLACE: Q: Okay. Thank you. And can I ask you what percentage of your gas would -- and probably you have it here, actually, would be CCGT? Probably be a significant percentage of the gas?

MR. LAUCKHART: A: For 2008, I've given those numbers in the --

MR. WALLACE: Q: Okay, that's fine. Thank you. Well,

we can take a quick look, but -- that is --

MR. LAUCKHART: A: It's on page 9.

MR. WALLACE: Q: Yes. And it would look like combined cycle's about a quarter of the natural gas in terms of capacity, and about 40 percent in terms of generation?

MR. LAUCKHART: A: Well, 40 percent of the WECC resource, you mean? Or 40 percent --

MR. WALLACE: Q: Actually, you're right, I'm overstating it. In terms of natural gas, what percentage would combined cycle be?

MR. LAUCKHART: A: Well, between combined cycle and duct-fired combined cycle, if you put those two together, you've got about 36,000 megawatts of nameplate. And that's out of about 200,000 megawatts of nameplate capacity in WECC. So why -- that's about 18 percent, I guess.

MR. WALLACE: Q: On page 15, you run the EIA case using EIA gas and what Mr. Sheldon calls the EIA power prices, and what I think you call the EIA generation costs.

MR. LAUCKHART: A: What page are you on now?

MR. WALLACE: Q: I'm on page 15 of your evidence, as I understand it. In that model you have there, my understanding is you're running the EIA case using EIA gas and EIA power prices or generation costs.

MR. LAUCKHART: A: Yes. What happened here is, I was

asked to run this through our portfolio evaluation model. The numbers, as Sheldon -- Mr. Sheldon Fulton had provided in his testimony. I don't believe it's a legitimate analysis, but I can make those runs by putting the numbers in there.

MR. WALLACE: Q: And the result was very similar to the result Mr. Sheldon got. There was a substantial decline in the energy margin.

MR. LAUCKHART: A: That definitely is a lower margin for that unit if you use those inputs.

MR. WALLACE: Q: And you then conclude that the generation costs developed by the EIA are obviously much lower than the spot prices that would be expected to result in the WECC when gas prices are at the levels assumed by the EIA? And is that because the contributions of capital are much lower than what were in your table?

MR. LAUCKHART: A: Could you repeat the question?

MR. WALLACE: Q: I can try, sure. You conclude that the generation costs, or the prices, developed by the EIA are obviously much lower than the spot prices that would be expected to result in the WECC when gas prices are at the levels assumed by the EIA. And I take it that you're coming to that conclusion because the contributions to capital that are much lower than what came out of your own run on page 14.

Proceeding Time 2:20 p.m. T5A

MR. LAUCKHART: A: Well, you're confusing me a little bit about this -- the contributions to capital part of that statement. But, I mean, what I've said is, if I take the EIA gas price forecast, I can use that in my model with my assumptions, and I can get what I believe will be spot market prices. If those are the gas prices, I have a lot of data and a fairly sophisticated model that help me determine what will be the spot market electricity prices. And I just compare those prices to the numbers that were in that EIA table, which were clearly indicated as not being spot market prices, and mine are higher. That's all I'm saying.

MR. WALLACE: Q: Okay, I think we can wrap this up on this topic. Did you compare the results of this EIA case on page 15 to the results of the B.C. Hydro partial case at all? And the question is, would you agree they're consistent with it or similar to it?

MR. LAUCKHART: A: The EIA partial case --

MR. WALLACE: Q: The B.C. Hydro partial compared to your EIA case on page 15.

MR. LAUCKHART: A: Right. I mean, I don't have a comparison of that here.

MR. WALLACE: Q: Okay. Mr. O'Riley, have you done any comparison or looked at it?

MR. O'RILEY: A: Well, we've got the heat rates on our Exhibit 81B. You can see the heat rates for the EIA generation price divided by the EIA gas burner price, burner tip price, and the resulting heat rate is higher than our -- it's higher than our 25 percent recovery scenario, particularly in the early years.

MR. WALLACE: Q: Okay.

MR. O'RILEY: A: If you average it it's much higher, or it's higher.

MR. WALLACE: Thank you, panel. Thank you, Mr. Chairman, Ms. Boychuk, that's all I have.

THE CHAIRPERSON: Mr. Fulton, before you begin, do we have an exhibit number for the article with the sidebar from Dr. Pickel?

MR. FULTON: Yes, we do. It's C19-26, Mr. Chairman.

THE CHAIRPERSON: Thank you.

Proceeding Time 2:22 p.m. T6A

CROSS-EXAMINATION BY MR. FULTON:

MR. FULTON: Q: Good afternoon, panel. Mr. Lauckhart, I'd like to pick up where Mr. Wallace left off and the discussions that he had surrounding the use of the EIA forecast. And was the EIA forecast that you used the one that was released in January 2004?

MR. O'RILEY: A: Yes, it was.

MR. FULTON: Q: And according to the response to BCUC IR 1.26.4, a full update of the EIA forecast was to be

released in January 2005. Do you know, Mr. O'Riley, whether that update has been released yet?

MR. O'RILEY: A: We have a short summary of it. I don't believe the full document, which is, as I said before, is a roughly 300-page document, has been released yet. It should be available shortly.

MR. FULTON: Q: Okay.

MR. PICKEL: A: We did use the short summary version of the gas prices from that early bird release on the 2005 for our 2012 analysis and our base case.

MR. FULTON: Q: Right. Are you able to provide us with a comparison of the January 2004 EIA forecast and the numbers that are contained in the short summary for 2005?

MR. O'RILEY: A: I believe we would be able to do that, yes.

MR. FULTON: Q: All right. Could you treat that as an undertaking then, please?

MR. O'RILEY: A: Sure. So, sorry, is that just the gas prices then you want to compare? Is that --

MR. FULTON: Q: Just the gas prices, thank you.

MR. O'RILEY: A: Okay.

Information Request

MR. PICKEL: A: Yes, to take that the next step --

MR. FULTON: Q: Yes.

MR. PICKEL: A: On page 10, our results considered a

case looking at, in 2012, using the EIA 2005 prices and the EIA 2004 prices. And the impact, at least on point utilization, was under a half a percentage point in capacity factor.

Proceeding Time 2:25 p.m. T07A

What matters not so much as the level of gas but the plant of gas prices, but the mix of plants. What also matters is regional differences in gas prices.

MR. FULTON: Q: All right, thank you.

MR. LAUCKHART: A: If I might just pick up on that, on page 17 of my testimony I talk about some of the things that would be important to the value of a -- the risks associated with the dispatch of a Vancouver Island-based combined cycle combustion turbine. And I talk there, on page 17, about the relative -- the relative prices of gas across the WECC as important. But generally the overall level of gas price isn't as important, because if gas prices go up, it's going up for the Vancouver Island project, but if it's a Henry Hub-based kind of increase, which affects everybody, well, it goes up for everybody, spot market prices go up. And therefore, there is almost an imperceptible change in the value of dispatch of the combined cycle.

And in fact our experience is, actually, higher gas prices for a very efficient unit like this

give a small boost to the value, a higher gas price would give a small boost. But that's not nearly as important as all the other uncertainties that we're having to deal with here in hydro, and load volatility and those kinds of things.

MR. FULTON: Q: Thank you.

MR. PICKEL: A: Point out an exhibit that offers a little more detail on this. If you look at page 13 of my testimony, it lists our base case, which was based on NYMEX quotes in 2008, and EIA 2005, price forecasts for 2012, and then we have an EIA 2004 case where gas prices are $1.33 lower in B.C. versus the NYMEX numbers used for the base case. And the 2012 prices are 47 cents lower. But there is less than a one percent impact on capacity factor.

MR. FULTON: Q: Thank you.

MR. SANDERSON: Mr. Fulton, I'm just a little unclear as to whether, in light of those responses, you still require the undertaking be fulfilled, or whether the witnesses have adequately covered it.

MR. FULTON: No, we would still like to have the undertaking fulfilled, thank you.

MR. FULTON: Q: Mr. Lauckhart, I'd like to take you back to your evidence at page 9, and again, Mr. Wallace discussed this with you in part, and in your response to question 11, you provide information about

natural gas generating plants in 2008. Can you tell us what the average heat rate you assume for combined cycle plants?

MR. LAUCKHART: A: Well, we have each combined cycle plant in there, so every one would have its own heat rate, based on research we do. But the heat rates are right around the 7,000 BTU per kilowatt hour rate, you know, in general for this fleet.

MR. FULTON: Q: Thank you. And what about the average heat rate for the combined cycle plants with duct firing?

MR. LAUCKHART: A: Well, the combined cycle -- you know, a combined cycle plant with duct firing can be run without the duct firing being operated. And when happens, the heat rate is the same as it was just for the combined cycle plant. Duct firing, which is just a matter of injecting gas into the -- you know, after the -- you know, a combined cycle works with a jet engine getting gas, spinning, and a simple cycle would just exhaust that heat. Combined cycle takes that heat, shoves it into a very large -- what we call a steam generator, like a reverse radiator on your car, creates steam, and then that steam goes into a steam turbine generator.

Well, duct firing, all it does is inject gas, additional gas, into that radiator and burns some

more to get some more heat in there. It's a much less efficient way to generate electricity. So typically, you would approach it with the combined cycle itself has the heat rate of about 7,000. If you want to start getting more power with duct firing, injecting gas in there, burning it, it's -- you know, about 9,500 BTUs per kilowatt hour for that last increment of power. That's the heat rate on that increment.

MR. FULTON: Q: Thank you.

MR. PICKEL: A: And we use a similar assumption in our modeling of something in the 9,000 to 10,000 BTUs per kilowatt hour heat rate for generating incremental energy on duct firing.

MR. FULTON: Q: The combined cycle duct-fired plant for -- that's referred to in the third table on page 9, can you tell us what the average heat rate is for that plant?

Proceeding Time 2:30 p.m. T8A

MR. LAUCKHART: A: Are you talking about the 15,000 megawatt number there?

MR. FULTON: Q: Yes.

MR. LAUCKHART: A: Of course, that's a lot of plants that aggregate up to 15,000 megawatts.

MR. FULTON: Q: Right, sorry.

MR. LAUCKHART: A: But, and so each one is a little bit different, but what I'm saying is in general there are

about 7000 megawatts without the duct firing, and to get the -- 7,000 BTUs per kilowatt hour without the duct firing, and to get the additional power from the duct firing, it's about 9,500 BTUs a kilowatt hour.

MR. FULTON: Q: Okay, thank you, I just wanted to confirm that.

Mr. Wallace asked you about the average utilization rate for the combined cycle plants in the WECC in 2008, and you said it was about 52 percent. Do you recall that evidence?

MR. LAUCKHART: A: Under normal conditions that would be it.

MR. FULTON: Q: And would the combined cycle with duct firing utilization rate be about 60 percent?

MR. LAUCKHART: A: If you calculate the difference between the combined cycle duct firing megawatts of 15,087, and the combined cycle of duct fired generation 79,320, that's 60 percent. But I would caution against thinking that a duct-fired unit is going to be operated more than a non-duct-fired unit. This is, as we talked about before, depending on where they're located, what the situation is with the congestion, et cetera, it's driving a whole lot of units here.

But in general, duct firing under normal conditions isn't going to operate very often. It's

just, you know, if you have a heat rate of 9,000, it's not going to operate at all, while a combined cycle will, because its heat rate is 9500. So the duct firing isn't going to operate nearly as much as the base combined cycle unit.

MR. FULTON: Q: Okay, thank you.

Now another area that was discussed with Mr. Wallace related to the table that appears at page 14 at the top, and I had a question about the capacity factor of 77.5 percent, which is -- or 77 and a half percent, which is shown on line 1. Can you tell me, does that number reflect the fact that the plant would not be available for all of 2008?

MR. LAUCKHART: A: No, that -- I think we've assumed this plant was available on January 1st, 2008, in our modelling.

MR. FULTON: Q: So why then after 2008 do we get a capacity factor that ranges from 89.5 to 95.9 percent?

MR. LAUCKHART: A: Well, if you look at Exhibit 81A that we've talked about a few times, you can see that our model is showing increasing market heat rates as you go from one year to the next. And that's caused by, as Mr. O'Riley said, the tightening that's slowly happening in the west as load grows faster than new resources are being added. So as the load grows and there aren't as many new resources or cost-effective

new resources being added on an incremental basis, then that fleet that exists there before is going to be operating more than it was. And then you could look at individual plants across WCC and see how it impacts them separately, but in this case we're saying it's moving up because the general overall tightening, and it's a better location for this combined cycle than it would be, for example, if it was at Palo Verde.

MR. FULTON: Q: Thank you, Mr. Lockhart. Thank you, panel. Those are my questions.

Proceeding Time 2:35 p.m. T09A

THE CHAIRPERSON: I'd like to begin by following up on Mr. Fulton's last question with respect to the market dynamics. And I would like, and it may be somewhat difficult to do this, but I'd like to get a sense of how much uncertainty there is with respect to your assumptions about market fundamentals. You, Mr. O'Riley, have identified that the change from 2012 to 2013 is consistent with your view of market fundamentals. And throughout the forecast period you're making some assumptions. Both models make assumptions about market fundamentals, and I would like to ask a rather -- I guess broad question. But I would like to get some comfort that the forecasts you make with respect to market fundamentals largely on

the supply side are, you know, sort of reasonable.

You've got to make some assumptions, but what's your sense of the confidence that you can attribute to those forecasts on the supply side?

MR. O'RILEY: A: I could start. One of our challenges when we started down this road of trying to come up with an alternate heat rate was to come up with an objective reason why it would stay like that for a long period of time, that's grounded in economics, recognizing the load's growing, and new generation's required. So some of the examples or alternatives we looked at, like a steadily-improving efficiency in the new capital stock, those kind of things take a long time to work their way through the system, just given there's just -- there's already 200,00 megawatts of generation there, and changes in generation type, like the, you know, the clean coal, for example, coming in. Takes a long time for that to have an effect.

So we ended up, in terms of our partial recovery scenario, having to pretty much come up with a contrived example to force the -- to force the results down to -- and really what we're saying is there is people are building generation in that scenario for all kinds of reasons, but not because they're making money on it in the wholesale market. So we've weighted that scenario 50 percent, but I

think in trying to explain why it could possibly occur, we think the actual weighting is less than that. So we think we're being conservative in that respect.

THE CHAIRPERSON: I'll welcome comments from Dr. Pickel or Mr. Lauckhart on this one.

MR. PICKEL: A: The challenge is having a smooth transition. If capacity -- if there are substantial west-side capacity additions in excess of demand, you end up with no spike, and a price decrease. That doesn't happen very often, at least not in the last twenty years. Instead, what we've gotten is, we've gotten occasional price spikes, by capacity lagging demand. And that transition usually -- or isn't smooth, because of the uncertainties related to hydro risk in the west, and the possibility that you get an economic growth spurt, and most of our load forecasts are only one to two percent per year, and you end up with a five or six percent growth year or two like we had in '99 and 2000, quickly you've run through seven years of flexibility. So, that smooth transition can -- you -- the thread is that smooth transition turns into a price spike.

MR. LAUCKHART: A: I would like to address that question by just looking at my first three responses, and they're Q-19. As you know, this is a -- like many

commodities, this is a supply/demand activity. And the number one uncertainty here in the west is, what is the hydro going to be on any year?

Proceeding Time 2:40 p.m. T10A

I've assumed average hydro for every single year, and I can pretty much guarantee we're not going to have a single year of average hydro. But we don't know which direction it goes.

You can, for example, lose 8,000 average megawatts of supply in the west just because it didn't rain some year. That has a huge impact, and the impact when you have a dry situation is such that prices go up so much higher on a percentage basis than when you have a wet situation and how far they go down, it's a skewed distribution.

So the first thing is you need to recognize the value in any year is going to depend in a large part on how much precipitation we have.

The second thing is, another weather-related event is that if loads go up a lot, and you know, loads can go up from economic activity or they can be impacted by extreme weather events either in the northwest or in the southwest in their seasons, it can have a huge impact on supply and demand.

So it's those two uncertainties that we think are so important in the west that we strongly

recommend to people, and banks are actually buying into this, looking at the stochastic analysis. Because of the distribution, it's not a normal distribution, it's a skewed distribution on the value of a plant like this, that you really need to assess those uncertainties with some kind of a stochastic analysis.

Then the third one I'll point out is what I call competition from other generators, and this is what we were talking about in a number of places. Well, how many generators will be built in the future? And we -- Henwood believes it's going to be a cyclical thing. There's some -- you know, people get enamoured of the fact that we ought to be building, and then you get an overbuild, and then they thing we built too many, and you slow down. Our forecast here assumes we're trending into a nice balance, and our trend is slightly different than some others but fairly close. And the change in heat rate from whose trend you're using isn't that -- if you look at it it's not that big of a player here, not nearly as much as these other uncertainties.

So if you're asking about how confident we are about the stuff going in the model, I'd say, well the hydro and the load, especially as impacted by weather, and then, you know, who's going to continue

to build over time and who's going to not are the three biggest uncertainties I see.

THE CHAIRPERSON: Are you able to predict retirements with some certainty?

MR. PICKEL: A: We calculate retirements based on known information about permit information, and also if a unit is failing to pay for, in its margins, the fixed O&M cost associated with the unit. So we attempt to calculate retirements, but often there are outside factors on that.

I would like to supplement Mr. Lauckhart's statement. He said it very well. There's substantial uncertainty. His categorization of risks is roughly the same as mine. The FERC testimony that Mr. Wallace submitted into evidence as an exhibit has an example of just that sort of series of events in the last figure, and summarized in words in the first table, showing the series of events of high economic growth, poor hydro, more poor hydro, and an extreme price event driven by the underlying economics.

THE CHAIRPERSON: I was interested in C19-26 which is the article by Mr. -- or Dr. Roark with your sidebar. And on the issue involving weather, presumably there's some benefits of diversification of fuel types. And the last comment that's made on the page just before your sidebar, Dr. Pickel, says:

"In other words, the Western Union connection in many ways operates efficiently as if it were an integrated system implemented throughout the west's longstanding tradition of wholesale liquidity."

And I'd like to get your comments if you can provide any, as to whether or not there are any benefits of diversification at the western interconnection level, or the comments that are made here largely about efficient dispatch of what's already there. Or what's there.

Proceeding Time 2:45 p.m. T11A

MR. PICKEL: A: In round numbers, and Richard Lauckhart can correct me if I'm too -- get too far out of line. Roughly the whole system uses energy of 750,000 gigawatt hours. A third of that, in an average hydro year, comes from hydro. As illustrated on page 9 of Mr. Lauckhart's testimony, in 2008 he's estimating that roughly a third of that comes from natural gas sources. And then the remainder is nuclear, another 30 percent -- I'm looking at the right table, I think. Nuclear at about 30 percent, and -- oh, I'm sorry, coal at about 30 percent, and nuclear at 8 percent.

So we do have, for total average energy, and since average price is what most utility customers

pay, at least as retail users we do have a fairly diverse system.

THE CHAIRPERSON: Has any work ever been done to assess, if you will, what the optimum mix would be, just in terms of diversification of that risk, across fuel types? Or is it too driven by the opportunities that are available? You know, there are limited opportunities for hydro, limited opportunities for coal. Is the mix driven by what's available, or is there some efficiency that's going on in the marketplace here that's driving to a certain mix for the western interconnection?

MR. O'RILEY: A: Are you referring to the mix of the market in aggregate? Or are you talking about B.C. Hydro's diversity?

THE CHAIRPERSON: Well, I'm maybe getting there.

MR. O'RILEY: A: Yeah.

THE CHAIRPERSON: I want to talk about it at the WECC level first.

MR. O'RILEY: A: Sure. Maybe I could just start. I think the mix is really -- the generation fleet that's arisen is really a function of sort of the natural advantages and disadvantages of the different region. So we've got hydro in the northwest, in B.C., we've got a lot of coal and gas in Alberta, we've got coal in Montana. In the southwest, where they don't have

as many natural resources, they've got -- that's where the nuclear is, and they import a lot of energy.

So I think this -- the fleet as it stands today is a function of history, and the benefits of the natural resources of the region. I think that, given the system, I think it does get optimized very well, because even the smallest utility with a -- you know, a few contracts and assets, are every day looking at the market prices, should I run my generator today, or should I buy in the market, or if -- do I have something to sell?

So there's a -- going back almost twenty years now, there's been a daily wholesale market -- really a surplus disposal market, if you will, for electricity. And that's what all these utilities and generators use to optimize the resource. I think generally, on an hour-to-hour basis, it is optimized.

The question about what resources we build going forward, I mean, that's a much harder question, and we're trying to explore that through the IEP. And the challenge there is, the answer's very dependent on assumptions you make about things like gas prices, and all kinds of sort of economic -- macroeconomic factors. So it's a very difficult undertaking, and we've got some significant decisions here in B.C. around different types of resources that -- what we're

trying to do with this scenario approach is just get a better sense of what resources look good under which options. But it's not an easy -- there's no easy solution to that. So --

MR. LAUCKHART: A: I generally agree with that. For the long-term resource mix, of course, for years all of us utilities did our resource plan, and we did whatever we were doing to make our decisions, and like Chris says, if you were in the northwest, you usually didn't focus on gas, you went after hydro, and then you went after some coal.

Proceeding Time 2:50 a.m. T12A

In California, of course, they didn't have coal close by so they tried to get some outside and then they built some nuclear.

Those resource plans, vertically integrated utilities for a long time set the resource mix, and they were worried about each of them on their own.

At some point in time in the late '90s, somebody said, at least for part of the region, "We don't want you guys to do that anymore. We're just going to have merchants come in," and they did. They particularly came in when they saw these really high market heat rates. They said, this is a gold mine and you can make a lot of money with gas because you can build it fast and cheap to permit, and so we got a

huge, if you look at my chart, influx of those kind of resources in a short period of time which impacted the portfolio we have in existence today WECC.

But once it is in existence, then we have a lot of people, as Chris was saying, okay, on a hour to hour basis, what's the most efficient use of this mix that we had given the loads, and so I think it's fairly efficient from that standpoint. You know, I'm not sure if we had the invisible hand coming up with this resource mix. Maybe we might have come up with something else, but everybody was doing what they thought was best at the time.

THE CHAIRPERSON: Right. I would like to take you to B-81B, which is the market heat rate chart. Mr. Sanderson asked you in your direct if you prepared your numbers for the market heat rates independently of one another and you confirmed that you did.

If you will, the differences that are here, so sort of if they -- I think really probably the best way to look at this question is if you look at yours, Mr. Lauckhart, you've got the highest heat rates. When you see that compared to the other numbers that are here, for example, the AEO 2005, does that surprise you or is that within the realm of what you might expect and so it's suggesting that it's a reasonable forecast on your part?

MR. LAUCKHART: A: This doesn't bother me from the standpoint I can fully explain all the differences, and when you get down to the differences it just becomes a little bit of difference of opinion of what new entry is going to come under sort of a rational input approach. And so for example, when Mr. O'Riley puts in his -- assumes that prices are going to rise to a level by 2013 to accommodate the economics of a new combined cycle unit, well, I'm actually letting prices rise and when the prices rise so high that they will accommodate a new unit I actually put a unit in, test it to see, and then I do my dispatch. So to some extent, we are doing the same except I'm going through the rigours of, you know, running the model and testing and all that kind of thing and he's just kind of taking a shortcut.

Now, of course, if you say, well, what does a combined cycle combustion turbine going to cost in 2013, you have Mr. O'Riley's estimate of that and my estimate of that. It's a slightly different number which will cause a little bit of a slightly different reason here. I don't think any of us know for sure what a combined cycle will cost in 2013 with respect to permitting, emissions, offset costs, and all those kind of things. It gets pretty complicated.

So as between those top two number, I think

it's just pretty much a difference of what we think new resource economics are for building the resources.

Now, if you drop down to the QEM average, well, we know that that's kind of been weighted by Mr. O'Riley's 25 percent case, where he is showing this whole time period, you know, no new resources recovering its full cost and we, like he, agree that's not sustainable in the long-term.

Proceeding Time 2:55 p.m. T13A

There might be some low points where it comes down to the side, but it's going to be followed by some high points, so -- and then with respect to the other numbers on this page, of course, we believe that's a problem of mixing a generation component of a retail rate with a market-friendly price, and that that's not really what we would call a market heat rate.

THE CHAIRPERSON: Right. Yes, and your testimony speaks to that.

I maybe have missed the obvious here, Dr. Pickel, but I will ask. Why are you forecasting only to 2012?

MR. PICKEL: A: Pardon me?

THE CHAIRPERSON: Your forecast on my read of B-81B is to 2012, am I correct?

MR. PICKEL: A: I have one forecast at 2008 and one at 2012. In 2008 I'm lower than the group because I've

added more capacity. I've added some generic capacity because conceivably we might have approaching some reserve margins in some of the major sub-regions. In 2012, again I believe I've added more of the generic capacity, mixing combined cycles in combustion turbines, than Mr. Lauckhart, therefore my numbers are a little bit below his for the market heat rate.

THE CHAIRPERSON: And beyond 2012.

MR. PICKEL: A: We didn't simulate beyond 2012.

THE CHAIRPERSON: And why was that?

MR. PICKEL: A: Because our model is larger and more complicated, we just picked the first year of operation. And the year 2012, because it was our feeling as reflected in this information here, that market would have tightened up substantially by 2012. We wanted to reflect a year where the market was tighter.

THE CHAIRPERSON: Do you see -- you may not have done the analysis that was necessary to do this, but can you comment on what you might expect for 2013?

MR. PICKEL: A: Well, since we've starting adding generic capacity at that point, I assume our numbers would continue on at about the same level they are for 2012, maybe a little bit higher as we have to add capacity in other regions.

THE CHAIRPERSON: Thank you. Those are my questions. Is

there any re-examination, Mr. Sanderson?

MR. SANDERSON: Just one question, Mr. Chairman, for Mr. O'Riley.

Proceeding Time 2:59 p.m. T14A

RE-EXAMINATION BY MR. SANDERSON:

MR. SANDERSON: Q: Mr. O'Riley, if I could take you to your slides, and I believe it was the second slide of the first set of slides. Yes. If you look to -- if you look to the slides which is entitled "Workshop Objectives," Mr. Wallace asked you whether -- or focused on the bullet that says "obtain approval for use of alternative heat rate scenario and price forecasting process".

Are you able to tell us whose approval -- or the obtaining of whose approval was being referenced in that bullet?

MR. O'RILEY: A: It was B.C. Hydro Executive approval, via the risk management committee.

MR. SANDERSON: Q: Thank you. Thank you, that's all I have, Mr. Chairman.

THE CHAIRPERSON: Thank you. You're excused.

(WITNESSES ASIDE)

MR. SANDERSON: Mr. Chairman, just to confirm with respect to this panel, we will file the couple of outstanding undertakings that came from them. Mr. Fulton, off the record, has suggested at or before the

time we file final argument, and with your leave, that's what I propose to do.

THE CHAIRPERSON: That is satisfactory.

On my count, Mr. Sanderson, there are three undertakings with that panel. In any case, the record will speak for itself.

MR. SANDERSON: So it will, Mr. Chairman.

THE CHAIRPERSON: Okay. That then brings us to the matters that we need to deal with before we close. I think there are -- well, there are at least two that I'm aware of. One of them is Mr. Weisberg's, I'll call them "issues", and then there are -- I'd like to hear if there are any objections to the panel's proposal with respect to the timing of final argument, and I think we've dealt with the issue with respect to -- Mr. Andrews?

MR. ANDREWS: I have an issue to raise.

THE CHAIRPERSON: All right. And then there may be some further issues with respect to undertakings, but I think, Mr. Sanderson, you may have already addressed those, that you'll provide answers at the time of -- on or before closing argument with respect to any undertakings.

So we probably, unless there is a preference, I think I'll deal with the matters in that order. Mr. Weisberg, objections regarding final

argument, Mr. Andrews, and I think that brings us to the close of this proceeding. So I -- Mr. Fulton?

Proceeding Time 3:01 p.m. T15A

MR. FULTON: I just wanted to say, Mr. Chairman, that in terms of closing the proceeding, we should formally close off the evidentiary record subject to the filing of the outstanding undertakings. And I would prefer to close off the evidentiary record in real time, so that if anything was received at the Commission office up until the time we close here, then that would form part of the record. Anything received after that time, other than the undertakings to be fulfilled, would not form part of the evidentiary record.

THE CHAIRPERSON: Right. I think that's correct.

Mr. Weisberg.

MR. WEISBERG: I'd just like to add a caveat to that, that because you haven't determined my motion yet, that those items may be outstanding. That hasn't been determined by the Panel. To keep that in mind.

THE CHAIRPERSON: Right. I think then, Mr. Sanderson, we should hear from you with respect to Mr. Weisberg's motion.

MR. SANDERSON: There were three things I was left to deal with as I understood your comments just before lunch.

The first was with respect to the Ladysmith

peak year, and that was to confirm that the Commission had all of the bid information that would permit -- well, I guess confirm that the Commission in confidence had all the information Hydro did with respect to price and other particulars of that project. And as is well known, I think, to Green Island and Mr. Weisberg, through the process of reading BCUC Commission IRs 1.9.1 through 1.9.3, all of the information which was provided into the QEC was provided to the Commission in confidence. And I refer in particular to 1.9.3, the question which is:

> "Please provide the tender spreadsheets illustrating the net tender for each project evaluated by the QEC."

And the answer is:

> "This information was included in the spreadsheets provided to the Commission in confidence on December 2nd, 2004."

That includes all the AIF and CIF information which relates to the Ladysmith project. There is no other data relating to price or anything else that B.C. Hydro was provided in the process. And so the Commission has, and has had for some time, to the knowledge of the participants here, especially those who understand what's in the process because they were a part of it, all of the information which

Hydro has to provide to it.

The second thing you asked was to confirm by review of the record, whether the fact that the Calpine bid was returned unopened is disclosed on the record. And my information with respect to that is that I don't believe that it is clearly. It can certainly be implied from a number of places, but I don't think it is clearly.

Proceeding Time 3:05 p.m. T16A

I should advise that, to the bidder's knowledge, it was known that the bids would be returned unopened, and so Mr. Weisberg and his client knew, or had means to know, for a very long time that was the case. And I say that, because the bidders' workshops summary sheets, some of which have been filed in this proceeding, but not all of which have been filed, clearly indicate that.

And I should say last that, notwithstanding Mr. Andrews's comment about the Calpine letter, clearly presuming the opposite, and I don't quarrel with Mr. Andrews taking that inference from the Calpine letter, but the facts are completely divergent from that. And I have, and can read into the record if you wish, the letter that went to Calpine with the unopened tender.

And again, I don't specially want to give

evidence, so it rather depends on the approach the Commission is taking, but certainly if Calpine is permitted to put anything in, then this letter clearly should be part of the record, without question. If it would assist the Commission in determining whether Calpine should go in or not, I'm quite prepared to read this letter, it's short, and it goes only to the point of whether or not Calpine was advised as to whether or not Hydro was returning the information unopened or not. So I'm rather in the Commission's hands.

The burden of my submission with the material that's here is just this, that the bidders in this process, including Mr. Weisberg and his client, or certainly his client -- I won't say Mr. Weisberg, I'll say his client, absolutely knew that information from -- pricing information from bids that weren't accepted for the final process would not be opened by Hydro and would be returned unopened. And any participant in the process had been told that from the beginning.

So for it to be suggested by Green Island that they're sandbagged by that information, or that they didn't know that, is, with great respect, is -- well, I won't put an adjective on it, I'll do this. I will assume that Mr. Weisberg has not had the

opportunity to consult on that particular aspect of this with his client, because I'm sure his client, whether or not he knew, must have known that that was the case. That the information would be returned unopened. And that because, rightly or wrongly, and that's a completely separate issue, Hydro made the determination there was a material qualification on this particular bid, it followed necessarily that it would be returned unopened. It would have been a breach of the CFT had that not been so.

To my mind, that probably should dispose of the substantive issue -- that is, should any further accommodation be given to Calpine? Having said that, B.C. Hydro doesn't object to any information going to the Commission in confidence that the Commission believes it needs. It's after all got all of the information with respect to all of the bids in Tier 1 already. And I don't want it said that we're somehow trying to stop the Commission from obtaining any of the bid information. We're not.

Calpine and Green Island have known for a very long time that B.C. Hydro didn't have it. And they have not managed to get it before you notwithstanding that throughout the long course of this hearing. If somehow circumstances were to change between now and -- I don't know, Sunday or Monday, and

suddenly, Calpine wants to put forward a letter to the Commission, I think it has no value for the record, I think it is completely unreliable, because it won't be tested, and not -- we won't know -- that is B.C. Hydro won't know, even if we see it, whether it bears any relation to what was in that unopened envelope, because it was never opened.

Having said all that, I'm prepared to deal with that in argument, if somebody thinks -- and somebody in particular, the Commission thinks it would be useful to have that information. And if, unlike any time in the last three months, Calpine now decides it wants to offer it up, but -- so I guess my bottom line is, I'm not objecting to the Commission writing a letter to Calpine, or doing something else or indicating on the record that if a letter is submitted it will be received.

Proceeding Time 3:10 p.m. T17A

I will argue that it has not probative value to you in argument but, as I say, I'm prepared to deal with it in argument if the Commission would find that expression of acceptance, if I can put it that way, useful to it.

THE CHAIRPERSON: Thank you.

Mr. Weisberg. I think it will be most helpful to the Panel if you put your emphasis on the

possibility that we do no more than indicate on the record that we will accept a filing from Calpine.

MR. WEISBERG: I think that, with respect, that we need more specification than that, Mr. Chairman.

THE CHAIRPERSON: I'm simply giving you an indication as to where you might put your emphasis in your submissions, that's all. So do as you wish.

MR. WEISBERG: Thank you. I'll say this as well. I think I can shorten my submissions in reply if the Commission Panel confirms your view of what Mr. Sanderson has said, that it's your view as a Panel that all of the information contained in Epcor's price information form is already before you, and if that's the case, if I can have that assurance, then I don't need to address that further. If that's not the case then I would like to.

MR. SANDERSON: Mr. Chairman, just before -- with respect to address that, I've said to Mr. Weisberg again and again in this proceeding, and I was very careful in all my remarks to say the information that's before you is with respect to a Ladysmith peaker. I'm not prepared to say, again, and would urge the Commission not to say, because the materials I don't think say exactly who that is. That's the one that I take to be relevant to Mr. Weisberg, is the Ladysmith peaker, and if the question can be reframed

again to that, the Ladysmith peaker that is clearly evaluated in the QEM methodology as indicated in the evidence, then I'll stand down.

THE CHAIRPERSON: Yes, Mr. Sanderson, thank you for that comment.

MR. WEISBERG: That's a helpful qualification, and I will rephrase my request to the Commission along those lines, and I think you understand the confirmation I'm seeking, so..

MR. FULTON: Well, Mr. Chairman, you know, this is an extremely unusual request to make of a Commission Panel. We have it on the record that this information has been filed by the Commission. If in the deliberations that the Commission takes in reviewing the application it determines that Mr. Sanderson was incorrect in his submission, then the Commission can take certain courses if it decides to take them.

But it is my advice to the Commission on this point that it ought not, and it need not confirm or provide Mr. Weisberg with the confirmation that he's seeking from the Commission.

THE CHAIRPERSON: I think there's considerable merit in what Mr. Fulton has just said, Mr. Weisberg.

MR. WEISBERG: I do as well, Mr. Chairman, but the problem is this, and it's not that I'm trying to put the panel on the spot in that regard.

This morning, in submissions about what I'll call then the Ladysmith price information, I believe that your remarks demonstrated that you were, yourself, not certain that the price information was available to you in the same form in what has already been filed. I can give you references there if you like but --

THE CHAIRPERSON: This goes directly to the point that Mr. Fulton is making. The information is available to the Commission Panel. I'm not going to speak to how we are going to use that information.

MR. WEISBERG: I'm not asking for that, Mr. Chairman. I only want the assurance, and I thought that Mr. Fulton was saying you couldn't give me that assurance, but I think you just have.

THE CHAIRPERSON: I just did what?

MR. WEISBERG: I'm trying to establish, Mr. Chairman, and Madam Commissioner, that the Commission Panel has access to information that is the same as the information contained in the Ladysmith bid price information form.

Proceeding Time 3:15 p.m. T18A

THE CHAIRPERSON: Mr. Weisberg, move on.

MR. WEISBERG: From this morning's transcript at page 3037, I just want to first of all make a correction. On the first line on page 3037 -- actually beginning

on the previous page and continuing on 3037:

> "My primary concern is that information is before the Panel in the most successful form,"

and I believe I said "accessible form", and I'd ask for that correction to be made.

Mr. Sanderson this morning at 3042 of the transcript said that:

> "We have absolutely clear testimony, we've had it from the very beginning, that B.C. Hydro didn't open the bid."

And I'm going to suggest that that is incorrect.

I invite Mr. Sanderson in argument to provide specific transcript references to support that.

Mr. Van Ruyven at Volume 6, transcript 1122, testified at lines 12 to 18:

> "The tenders that were evaluated under the QEM were compliant bids. So some, I believe six bidders tendered, and two of those bidders were not compliant so they were not -- their price information and other information was not populated into the QEM. It was only compliant bids that were looked at."

That last comment, I believe, must

necessarily have meant that only compliant bids were looked in the QEM, not looked at generally. And that same context, I say, must be attributed to the testimony at transcript 1132 which was quoted this morning by Mr. Sanderson at transcript 3028.

At Volume 6, page 1228, Ms. Hemmingsen testified at lines 14 and 15:

> "Calpine's bid was rejected because it was non-compliant."

That determination could not possibly have been made unless Calpine's bid, as perhaps distinct from the price information form contained in the bid, if the bid was open, reviewed and considered. B.C. Hydro's staff could hardly have held the closed bid submission up to their foreheads and ascertained that it was non-compliant.

At transcript 3029 Mr. Sanderson said, so quote -- this is at lines 2 to 6.

THE CHAIRPERSON: Mr. Weisberg, can you help me with the relevance of your comments now to the issue as to whether or not we admit evidence from Calpine?

MR. WEISBERG: Mr. Sanderson has said that the record is clear that the bid was not opened and that it was returned; and I'm trying to correct the record in that respect.

MR. SANDERSON: Well, I can speed things up, because

that's my lack of clarity and I'll clarify my remarks then, if that will get us through this.

The bid process, as I thought was implied in my comments, and clearly it wasn't adequately, was a two-step process. The bids were opened. Of course people couldn't understand what was in them until the bids were opened. But envelope number 1 in the bids contained certain specified informations. I think it was characterized as the AIF, the Agreement Information Form, and I think that's in the record.

There were other envelopes, one of which was the PIF, and I think Mr. Weisberg -- that's what Mr. Weisberg was asking for as I heard him this morning, was the PIF information. That's the envelope that contains the pricing information and was unopened. And I think again, Mr. Weisberg's client at least was intimately and clearly more familiar than I was, and am, probably, with that process.

But if I confused Mr. Weisberg by saying the entire envelope was unopened and nothing was opened, clearly, I didn't mean that.

MR. WEISBERG: You went further than that, Mr. Sanderson, and you actually offered to provide an affidavit to that effect. But I will accept your correction.

I want to deal with Mr. Sanderson's claim that we -- “we” being Green Island, absolutely knew

that the Calpine bid would have been returned.

Proceeding Time 3:20 p.m. T19A

Mr. Chairman, this morning at transcript 3042, you, I think, invited Mr. Sanderson to explore that -- the possibility that there was something in the CFT that required bids to be returned. And Mr. Sanderson said that it's very -- there very likely is an obligation to return it unopened.

Within the CFT, there is an express requirement for bids to be -- or, sorry, materials to be returned unopened. That's found in Section 10.6 of the CFT. But that doesn't apply here. It deals with late or unqualified submissions. That's not the case for the Campbell River co-gen bid.

What is relevant is Section 18.17, which deals with non-compliant tenders. And I'll quote from part of that, which says:

> "…otherwise do not conform in a material respect to the requirements of the CFT will be rejected."

And in that section there is no mandatory requirement to return the bid, as expressly provided in 10.6.

So when Mr. Sanderson claims that it's -- that Green Island absolutely knew it would be returned, and refers to some material back in the bidder workshops, and there's an express provision in

the CFT itself that doesn't deal with that, that's quite a claim to make.

Mr. Fulton has raised a concern about whether the Commission has jurisdiction to issue an Order against Calpine, being a foreign corporation. It's a question, I think, that should be considered, but we submit that the concern is not an obstacle to what we're seeking. To be clear, we're not asking the Commission panel to compel Calpine to do anything. As amended, our application is essentially for a ruling on admissibility. Essentially, we're asking that the Commission Panel clarify that it will accept as admissible and confidential Calpine's bid in the VICFT, including its price information form, if Calpine voluntarily chooses to file it by a date certain established by the panel.

And another alternative, and I think in the circumstances, it may be more appropriate, to limit that further to only the price information, and not the entire bid from Calpine.

Alternatively, another way to address Mr. Fulton's concern may be to direct B.C. Hydro to forthwith contact Calpine, and confirm that it doesn't have Calpine's bid, and advise that if Calpine voluntarily files it, it will be accepted as admissible on a confidential basis.

I think what it boils down to, in terms of the -- how the ruling, or how the order, is drafted, is the question that you can address further with assistance from Mr. Fulton. I think that if there is a will, then there is a way, and that way may not be one of the ways I've suggested, but I suggest that you could explore that further.

Mr. Keough, in his submissions, suggested that our application and the submissions in support forgot about fairness. It's not. Basic fairness, we say, requires that you grant the application, or make the ruling, in respect of the Calpine bid. Mr. Keough made much of his assertion that Calpine is not a party. I concede, of course, that they've not registered for full intervenor status, but they have participated. They filed a letter of comment.

Mr. Keough cautioned that you may not have jurisdiction to direct or compel Calpine to file anything, and I agree completely. That's not what I'm seeking, and I think I've made that clear in restating what we're after.

Proceeding Time 3:25 p.m. T20A

It was entertaining to see Mr. Keough all fired up, but in more ways than one he didn't have his "ducts" all in a row.

I couldn't resist.

Mr. Keough's general concerns about fairness relate at best only to the weight that the Panel should give to the price information, not its admissibility and we submit there's no reasonable basis for an objection as to weight either. Mr. Keough conveniently ignores the fact that key aspects of Duke Point Power project without duct firing, the price information for that, remained confidential, and so of course that evidence was not and could not have been tested by cross-examination.

Further, he conveniently ignores the fact that all of the Duke Point Power project with duct firing price information remains confidential as do almost all the other details of that bid, and so of course that evidence could not and was not tested by cross-examination. And it's clear that both the Commission panel and B.C. Hydro contemplate that that project may be addressed in some way in the panel's decision at the end of this proceeding.

Mr. Keough is a medical marvel of sorts. He's, to use his own term, half pregnant, and given Mr. Sanderson's comments along the same lines at transcript 3040, he must be the other half of that genetic fraction. He asks you to accept -- "he" being mostly Mr. Keough, but certainly Mr. Sanderson as well. He asks you to accept without question that the

confidential price information of his client that has not been tested by cross-examination but at the same time to reject as unreliable equivalent evidence of exactly the same nature from other parties. It's just not acceptable for Mr. Keough to suggest that Epcor and Calpine, both well-established companies, would submit multi-million dollar legally binding bids in a casual or flippant manner.

The rigours of the CFT process upon which Mr. Keough's client unquestionably relies established the voracity of the price information as bid.

Those are my submissions.

THE CHAIRPERSON: Thank you. Mr. Andrews, let's turn to your matter.

Proceeding Time 3:28 p.m. T21A

MR. ANDREWS: This has to do with the reasonable apprehension of bias application and the question of whether a reconsideration application needs to be filed in order to protect the record in the Court of Appeal. We don't, of course, have the reasons for decision at this point so it would be premature to file a reconsideration request, and I do understand that tribunals have the authority to provide reasons for interlocutory decisions in the course of their final decision, in which case there would be no opportunity for a request for reconsideration.

But out of an abundance of caution, and I guess I'm assuming that because the motion was fully argued that there is not an appetite for a full-blown "serious" reconsideration process. I guess in some sense I would invite counsel for B.C. Hydro or Duke Point to comment on their clients' intention to raise absence of a reconsideration request at the Court of Appeal or any instructions that the panel may be able to give me regarding the appropriateness or practicality of filing a reconsideration motion at this stage in the hearing.

MR. SANDERSON: Mr. Chairman, Mr. Andrews raised that with me just before we resumed at 1:30. I advised him then and will put on the record now that I will seek instructions with respect to that.

My position is that this is a matter for the Court of Appeal, that is that there is nothing in the *Act* or in the Commission's practice of which I'm aware that requires anyone to bring a reconsideration application before they go to the Court of Appeal. The reason that Mr. Andrews wishes to address that issue is because the Court of Appeal in some of its jurisprudence has indicated that administrative remedies should be exhausted before legal be granted. And what I'm seeking instructions on and will advise Mr. Andrews Monday is whether B.C. Hydro is prepared

to waive any objection it might have to the failure to seek reconsideration as a bar to leave being granted should Mr. Andrews decide to take that step. And I've told him I will let him know forthwith and I'm sure I'll be able to do that Monday.

It will be my respectful submission that there's nothing, with great respect, the Commission can contribute to that debate. It really is a matter between the parties in terms of the position that they'll be taking in the Court of Appeal.

THE CHAIRPERSON: Mr. Fulton. Mr. Keough, for that matter. I see Mr. Keough, you might want to give him a chance first.

MR. KEOUGH: Thank you, Mr. Chairman, and I was a bit bolder than Mr. Sanderson. Not having spoken to my client I did express the view that I did not see any useful purpose to be served by generating the paper that would be associated with a reconsideration application and going through all the arguments, and I think that's where Mr. Andrews is coming from. So I think I'm on the same page.

To the extent that there is any concern on his part that I would raise that argument as a barrier to bringing the leave application, I think it's just as well to say we wouldn't, because that seems to me to be just a waste of everybody's time to go through

another reconsideration application. It would be similar to the one Mr. Wallace brought with no new information in support. So unless he's going to argue something differently this time, I don't see the point to it.

MR. FULTON: Mr. Chairman, I would just add that there is some precedent within the Commission not to insist upon a reconsideration application. That happened recently in the B.C. Hydro and Joint Venture Appeals against the Commission's decision in the TIGV proceeding, though the issue there related to an interpretation of the Special Direction and it was determined by the Commission that it would not require a reconsideration application.

So the Commission has done that in the past. I understand from Mr. Andrews and he can speak to it, that Mr. Sanderson's proposal to him is fine in any event. But I wanted to put that on the record.

Proceeding Time 3:32 p.m. T22A

THE CHAIRPERSON: You're of the view that Mr. Sanderson's proposal with Mr. Andrews is fine. Is that what you just said?

MR. FULTON: Yes, my understanding is it's fine with Mr. Andrews.

THE CHAIRPERSON: Is that correct?

MR. ANDREWS: That's correct.

THE CHAIRPERSON: So does that fully deal with your matter then?

MR. ANDREWS: Unless the panel has something to contribute further, then I'm quite happy.

THE CHAIRPERSON: Okay, thank you.

MR. ANDREWS: Thank you.

THE CHAIRPERSON: Are there any objections to the proposed schedule for final argument?

MR. ANDREWS: This is not by way of an objection but a clarification that all parties in favour of the EPA not being disallowed have the same deadline that B.C. Hydro does, in particular that DPP's deadline for filing would be the same as B.C. Hydro's. That wasn't mentioned either way in your statement.

MR. KEOUGH: To the contrary, I thought it was dealt with definitely in your statement. I thought your statement said all intervenors file on Friday. And the last time I checked, DPP is an intervenor. We've heard much on the record when there were some suggestions that parties should be allocated in the 2 or 4 camp for certain purposes of cross-examination and so forth, that there were many diverse views throughout the parties. So I certainly took it, what I think is appropriate is that Duke Point Power is an intervenor in this proceeding like everybody else, not an applicant. So I'm assuming I'm filing Friday

unless I'm told otherwise.

THE CHAIRPERSON: Mr. Andrews, Mr. Keough is correct. However, that doesn't preclude you from requesting or objecting to what I, if you will, raised as a tentative schedule for comment. So certainly you have that opportunity now.

MR. ANDREWS: With that clarification then, I would object. I think that it is appropriate that the intervenors who take a substantially different position from those who would ask the Commission not to disallow the EPA, are entitled to see the arguments to which they are responding. And whether that means having a secondary -- an additional deadline or, for convenience, having both DPP and Hydro file their argument at the same time. That's a scheduling issue, but it goes to a fair process that we'd be able to see DPP's argument before we file our response.

Proceeding Time 3:35 p.m. T23A

MR. KEOUGH: Mr. Chairman, maybe I can just get one further clarification from Mr. Andrews. By putting me in that position, is he also granting me a right of reply? And if he is, then I may well sit down and support his motion.

MR. ANDREWS: No, it's not normal procedure for a supporting respondent to have a right of reply, just as when I argued my application, none of the other

voices in support of the application were entitled to a reply. It's B.C. Hydro's application, they're the party with a right of reply.

THE CHAIRPERSON: When we did that, I asked for any objections to that procedure, and there were none.

MR. ANDREWS: Well, this is a standard Court procedure as well. If Mr. Keough were intervening in a Court proceeding, he would not have a right of reply.

MR. KEOUGH: Mr. Chairman, either I'm in or out. If he's going to treat me like an applicant, then I want the right -- if he's going to treat me like an intervenor, I want the right. He can't treat me like an applicant for filing and treat me like an intervenor in terms of not getting reply. I'm just simply saying he's got to decide.

THE CHAIRPERSON: Okay. Is -- are there any further comments with respect to the schedule for final argument?

We will adjourn for 15 minutes.

(PROCEEDINGS ADJOURNED AT 3:37 P.M.)

(PROCEEDINGS RESUMED AT 3:55 P.M.) **T24A**

THE CHAIRPERSON: Please be seated.

The Commission will accept Calpine bid information prior to noon on Monday, January the 31st. If Calpine does file, the probative value, weight and relevance will be issues for argument.

With respect to argument, I'm not going to provide any further instructions other than that there are many issues for you to address, some of which we have commented on, particularly -- well, the ones that arise from the *in camera* session and, beyond that, I think best left for you to identify the issues that you wish to raise during argument.

With respect to DPP and whether or not they should file with B.C. Hydro as requested by Mr. Andrews, we agree with Mr. Andrews, to the extent that DPP should file with B.C. Hydro but DPP should also, in fairness, be provided with an opportunity of reply as well. So DPP will file their argument with B.C. Hydro, so the intervenors have an opportunity to comment on that argument, otherwise they wouldn't have that opportunity if DPP were to file with the other intervenors. And so in fairness to the intervenors, DPP will file with B.C. Hydro. However, they also then in fairness need to have an opportunity for reply.

I think, other than Mr. Fulton, the opportunity for you to return to your issues with respect to closure of the record, if you wish to, I think we're ready to close the -- Mr. Sanderson?

MR. SANDERSON: Only this, Mr. Chairman. I did manage to get instructions over the break, and can confirm to

Mr. Andrews that B.C. Hydro, like Duke, will not raise a failure to seek reconsideration on a leave application, should one occur.

THE CHAIRPERSON: Thank you, Mr. Sanderson.

MR. FULTON: Yes, Mr. Chairman. Then I will ask that as of 4:00 p.m. today that the evidentiary record be closed, subject to the filing of outstanding undertakings by B.C. Hydro by -- or on or before February the 1st, and further subject to Calpine filing its bid by noon, Monday, January 31st.

THE CHAIRPERSON: Confirmed. The evidentiary portion is closed, as per Mr. Fulton's comments.

(PROCEEDINGS CONCLUDED AT 3:58 P.M.)