INDEX

Undertakings

INDEX(2)

New Brunswick Board of Commissioners of Public Utilities

In the Matter of an application by NB Power dated January 8, 2002 in connection with a proposal for Refurbishment of its facility at Point Lepreau.

Delta Hotel, Saint John, N.B.
June 10th 2002, 9:30 a.m.

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CHAIRMAN: David C. Nicholson, Q.C.

COMMISSIONERS: Ken F. Sollows
Jacques Dumont
H. Brian Tingley

BOARD COUNSEL: Peter MacNutt, Q.C.

BOARD SECRETARY: Lorraine Légère

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CHAIRMAN: Good morning, ladies and gentlemen. A couple of preliminary matters. Dealing with the in-camera hearing, NB Power undertook to provide some written responses to questions that the Province was lining up to put to you, if I remember correctly. Have you got that ready, Mr. Hashey?

MR. HASHEY: It's not ready yet, Mr. Chairman. This morning we are also looking at the issue of whether or not that transcript can be made part of the public record.

CHAIRMAN: Yes, okay.

MR. HASHEY: So just give us a day or two on that and we will have that.

CHAIRMAN: Certainly from my perspective, and you know better, but there certainly didn't appear to be anything in there that if the transcript were put on the public record that it would in any way affect what it is we have been trying to protect, which is NB Power's possible gain some economic advantage from selling of those reports to Hydro Quebec.

At one point I had hoped that we could have the informal intervenors make their presentations this Friday morning at the Board's premises, but it turns out that two of my Commissioners have conflicts, one is involved in an inquest here in the city and the other is involved in a previous commitment out of town, so we can't go ahead on that date. And it is very much looking as if informal intervenors will come after the evidence has closed but before summation. But as we get closer to that time we will let you know.

Now any other matters, Mr. Hashey?

MR. HASHEY: No.

CHAIRMAN: Any other intervenors have any matters of a preliminary nature? Mr. MacNutt?

MR. MACNUTT: Yes, two matters, Mr. Chairman. I haven't had

a chance to review the transcript of -- either of the two transcripts from Wednesday, June the 5th. But it was my understanding at the end of the -- my examination of Panel A that there was an undertaking by that panel to provide a sheet of paper in which there is a detailed explanation of the itemization in dollar terms of the drop in project cost between that presented to the Board of Directors of NB Power in January 22 of 2002 and the presentation of the direct evidence, the filing of same with the Board on February 25, 2002. Our collective memory is uncertain as to whether or not in fact there was an outright agreement to provide that itemization. It was my understanding that there was. Perhaps we could have --

MR. MORRISON: We don't have any specific recollection of that, Mr. Chairman, but we can certainly look at the transcript again.

CHAIRMAN: Okay. Why don't you check the transcript.

MR. MORRISON: It is probable that Mr. Marshall can deal with that in any event. But perhaps we can look at the break and get back to the Board on that.

CHAIRMAN: Okay. Again we have a new technician here, so perhaps if you would hold up your arm when you are going to respond, so that he can see which mike he has to turn on. Okay. Any other matters?

MR. MACNUTT: Yes. One additional matter, Mr. Chairman. In exhibit A-20, NB Power has provided certain financial information as requested by the Board. And the staff has been examining that information and what they would like to have in addition to that exhibit A-20 is NB Power provide draft audited financial statements for 2001-2002. And the second item would be -- there is some budget information provided in A-20, the second item we would like to be provided is the budget for 2002-2003 as approved by the Board of Directors. We would like both of those items to be provided and filed with the Board by NB Power.

MR. MORRISON: We will undertake to do that, Mr. Chairman.

CHAIRMAN: Okay. Thank you, Mr. Morrison.

CHAIRMAN: Anything else, Mr. MacNutt?

MR. MACNUTT: Nothing for me, Mr. Chairman.

CHAIRMAN: I guess the panel should --

MR. MORRISON: Recall Ms. MacFarlane and Mr. Marshall, they have already been sworn, Mr. Chairman.

CHAIRMAN: Yes, and they are still under oath from that time.

MR. MORRISON: Mr. Chairman.

CHAIRMAN: Yes.

MR. MORRISON: At the outset of the hearing we were dealing

with the appropriate handling of the Energy Probe evidence and the issue of whether there would be rebuttal evidence called and so on. And I -- as I understand the Board's position on that, is that NB Power has to address any of those issues it could reasonably anticipate arising from Energy Probe's evidence.

And I would propose to put several questions to the panel dealing with the Energy Probe evidence. But I appreciate that the Energy Probe evidence is not evidence as such yet, because we still have no idea whether Energy Probe is going to appear and participate.

What I would propose to do is have the evidence that was filed by Energy Probe marked as a document for identification. And then put questions to this panel with respect to certain statements in that evidence.

CHAIRMAN: That certainly appears to be an appropriate way to go, Mr. Morrison, because my understanding of the law of evidence is that this is how rebuttal would be handled in the circumstance. You have -- you therefore should put whatever questions you believe you should, being a "reasonable man", that's the concept -- reasonable person would anticipate that might arise.

So we will take --

MR. MORRISON: I have copies here as well, Mr. Chairman, for

the Board. I will have those marked.

CHAIRMAN: Yes. Everyone -- this will just simply be marked for identification at the present time. My understanding is that this would be marked for identification number 6.

Go ahead, Mr. Morrison.

MR. MORRISON: Mr. Chairman, before I actually get into the Energy Probe questions, I believe Mr. Marshall may want to advise the Board that there is a correction in filed evidence. And I would ask Mr. Marshall to point that out, please?

CHAIRMAN: Go ahead, Mr. Marshall.

MR. MARSHALL: Yes. In the evidence that's exhibit A-1, appendix B-2 the -- in the spreadsheet near the top left, just beside the word "base" there is a little box that says "Refurbishment option net present value". And it lists the different components. There -- there is an error in the second line of that.

Capital Refurbishment it says 518.8. That should be the same as at the bottom of the Capital Refurbishment column. The fifth column over at the bottom it should be 484.18. And in all of the analysis using this model, that particular number should be referenced to that box at the bottom.

Somehow in going through this it got changed. Now

it's of no consequence to the results. Because all of the analysis results are taken out of the box to the right of that where it gives net present value for refurbishment in a nuclear operation, minus the net present value for the gas to get the difference number of the 241.

So all of the results come out of the box at the right. This is really an information box, but it's incorrect information.

CHAIRMAN: So it should be 48418, is that right?

MR. MARSHALL: It should be 48418. And it -- and in every other case all the way through, whatever that -- is in that -- that second line should be equal to the number at the bottom of column five, Refurb Capital Cost NPV 2001 to 2002. It should equal that number.

MS. MACFARLANE: I would just like to add, Mr. Chairman -- I would just like to add, Mr. Chairman, that if you look in that box that has the 51880 in it, the total at the bottom of that column reads 268877, which ostensibly is the refurbishment option NPV. And that number is supposed to come over and go into the box to its right called, Results of Economic Analysis. And you will see that it doesn't. The number that comes over is 2634. The 2634 is the correct number and includes the 48418. So that total of 2668 should be 2634.2.

CHAIRMAN: Correct.

DIRECT EXAMINATION BY MR. MORRISON:

Q. - Mr. Marshall, I would ask you to turn to identification 6, which is the evidence of Energy Probe. And if you would refer, please, to page 10 under the heading, "Alternative Green House Control Strategies".

MR. MARSHALL: Yes.

Q. - And in the first paragraph under that heading it states, "Nuclear generation has the advantage of not releasing significant amounts of conventional air pollutants, including greenhouse gases." Do you agree with that statement?

MR. MARSHALL: Yes, I do.

Q. - Now it goes on in the same paragraph to say, "Valuing this advantage for the purposes of investment planning is inherently subjective." And it intimates or suggests that this should not be done.

What, if anything, do you have to say about that?

MR. MARSHALL: I agree that it is subjective. But it's a necessary and prudent part of the evaluation.

The valuing of future gas and oil prices is also subjective. But it's clearly necessary to value the economics of any alternative project.

If we ignored potential CO2 costs, if it was -- it

would be imprudent, and it would be contrary to our goal of meeting all existing and anticipated environmental standards.

Q. - Thank you, Mr. Marshall. Also on page 10 of identification 6 in the next paragraph it states, "NB Power applies shadow pricing of $15 a tonne to evaluate the investment alternatives it has considered. It is not clear that this evaluation criteria could be publicly acceptable if broadly implemented. If the $15 a tonne were actually applied to NB Power's emissions in the year 2000 -- the year 2000, excuse me, rates would have increased by 15 percent."

Now in your view has Mr. Adams correctly understood NB Power's evaluation and use of the $15 emission value?

MR. MARSHALL: No, he has not. The --

CHAIRMAN: Mr. Morrison, I don't want to get overly technical, but you are leading the witness.

MR. MORRISON: I'm sorry.

CHAIRMAN: You recognize that. There is a perfect example. He answered, no because of the way the question was put.

Q. - You are absolutely -- you are absolutely correct, Mr. Chairman.

Mr. Marshall, do you have anything that you would like to stay with -- say with respect to the statement that's

appears in the second paragraph I just referred?

MR. MARSHALL: Yes. Mr. Adams has incorrectly interpreted our evidence.

The assumed shadow price of $15 a tonne, he has assumed it's a real cost, which he has incorrectly applied to total emissions.

In actual fact it's only applied to the differential emissions between projects. And this is done to simulate what would occur in an emission trading system, to value differential emissions as it would be available in a -- in a trading market.

And I would refer you to page 26 of the evidence of volume A-1, appendix B-1.

Page 26 of appendix A-1 -- appendix B-1, sorry. The integrated resource plan. So at this point in section 422 of the integrated resource plan outlines how we evaluated the plans with CO2 costs.

If you look at the second paragraph, currently there is at line 12, currently there is increased development and support for economic instruments to help control emissions. And then further down, assuming that these systems continue to develop and include New Brunswick they will place a potential value or cost on residual CO2 emissions of different alternative expansion plans. To

account for the emission differentials, and I highlight the word differentials, between the plans an emission cost of $15 a tonne was applied.

And the way it is done is explained in the next paragraph. That the application of a cost in the PROVIEW analysis influences the dispatch of existing generation sources as well as the choice of expansion options. This is what a shadow price is. It uses a shadow price for the dispatch. It is not a real cost. But once you have done the dispatch and you determine the cost of the system, you then go down to the bottom, the last line at page 27 to 29, if the expansion plan emissions are different or they are lower than a targeted limit that you would have, you would assume that the credits could be sold into a market.

If they are higher then those costs would be charged to the project and we would have to purchase them out of the market. So the value of the emissions is only on the differential emissions, not on the total. And when Mr. Adams applied the $15 a tonne to the total emissions he then stated that this would result in a 15 percent rate increase which is fundamentally incorrect.

Q. - Thank you, Mr. Marshall. I would ask you to turn the page and go to the top of page 11 of identification number 6. And in that first paragraph the evidence discusses

basically what are a range of options for Point Lepreau refurbishment. And the first one that is referred to is purchases from Hydro Quebec or Labrador. What if anything do you have to say about that?

MR. MARSHALL: We have presented evidence to look at purchases from those areas. But there are some facts that you have to understand about the availability of hydro energy from Quebec.

Hydro Quebec today has some surplus energy and sells into the market. But they have limited quantities. And in Hydro Quebec distributions current strategic plan out to 2006, which they have publicly presented and presented to the régime in Quebec in hearings, they project that the low growth in Quebec will use up all of this surplus.

So any new resources -- any resources available to provide New Brunswick with power will have to come from new sources of power in Quebec. And these new sources of power are expected to be priced at market prices.

It is our view that these market prices that we have presented in evidence are higher than the cost of Point Lepreau. And we might note that Mr. Adams, even in his response to interrogatory number 3(f) shows that Hydro Quebec export prices last year, where they received a revenue of 7.29 cents a kilowatt hour on average for all

exports out of Quebec. This 7.29 cents a kilowatt hour that they received last year is higher than the cost of Lepreau refurbishment that we project well into the future.

Q. - Mr. Marshall, continuing in the same paragraph the other alternative referred to in the evidence is gas fire co-generation and I think specifically refinery co-generation. What if anything do you have to say about that?

MR. MARSHALL: We have -- in the load forecast we have already included 150 megawatts of industrial self generation, co-generation. And in that 150 megawatts we have already made provision for co-generation at the refinery.

Q. - And finally, Mr. Marshall, with respect to that paragraph on the top of page 11, Energy Probe refers to two responses to interrogatories PNB number 3 and CCNB-89 and to say that NB Power could construct 7.1 terawatts of gas fired co-generation. What if anything do you have to say about that statement?

MR. MARSHALL: I think Mr. Adams says that we, as an option to mitigate CO2, the 7.1 terawatts of gas generation would replace the 5 terawatt hours from Lepreau refurbishment plus 2.1 terawatt hours from coal generation. And as an

option we do not see this as a viable option.

First of all, it assumes that gas would be available to support 7.1 terawatt hours of new gas generation. And that at this current time is not a certainty.

It also assumes that there would be steam hose available in industry throughout the province to support 7.1 terawatt hours of generation for steam hose. And just to understand the 7.1 terawatt hours is equivalent to 900 megawatts of new gas capacity.

Even if we assume that there was gas available and there were steam hose available to do co-generation to get the heat rates used, the option is not cost effective. It would actually cost 100 to $150 million a year more than the Lepreau refurbishment.

Q. - Thank you Mr. Marshall. I do have some questions of Ms. MacFarlane with respect to identification number 6. Do you have that in front of you, Ms. MacFarlane?

I would ask you to turn to page 1 of that evidence and the top of page 2. There is an assertion there that NB Power's debt level is excessive. And it questions NB Power's ability to service its debt. What do you have to say about that?

MS. MACFARLANE: I have five points I would like to make in response to that statement. The first point is that Mr.

Adams is using out of date data. The report he is taking this information from is dated February 1st 1996. And it uses 1994, '95 data.

As it was pointed out in my presentation, since NB Power's debt peaked in December 1995 we have reduced our debt by over 500 million. Since the time DBRS issued the report that Mr. Adams has quoted, we have had seven fiscal year ends. We have had six rate increases.

CHAIRMAN: Ms. MacFarlane, sorry to interrupt. Where does he indicate that he is quoting from a particular report or whatnot?

MS. MACFARLANE: He does not specifically state that. But when you go through the data and look at the quotations and the numbers, in fact he is using a February 1st 1996 report.

On page 2, as an example, you can see he has made reference to in -- about the middle of the page at the end of the paragraph, you can see he has made reference to 1994. And as I say, there are a number of other statistics in the report that are directly from it.

On page 5, in the quotation.

CHAIRMAN: If I might just stop you there. You are referring 1994, okay. I see that. Sorry.

MS. MACFARLANE: All right. On page 5, you can see his

footnote, footnote number 3, he is quoting from the Public Electric Utilities in Canada Report an Emerging Problem for Credit Ratings February 1996. And it is that report that he has taken the statistics and his comments from Dominion Bond Ratings Service from. He has not used the report that we filed as an exhibit earlier, the 2001 report.

So as I say, first of all, that February '96 report uses '94, '95 data. We have since reduced our debt by over 500 million. We have had seven fiscal years since then and six rate increases.

The second thing I would like to point out is that Mr. Adams does do an analysis to claim that NB Power's debt per capita is higher than other utilities in Canada. He does not take his analysis further to recognize the electricity dependence or the electricity intensity of the New Brunswick economy.

New Brunswick industry, as an example, is some 50 percent more electricity intensive than the average in Canada. That is because of the nature of the industry, pulp and paper and mining particularly in the northern part of the province.

Our residential and commercial customers use more electricity per capita than the Canadian average. As you

know we have a very high space heating load in New Brunswick which is unusual for the rest of Canada.

CHAIRMAN: Again, Ms. MacFarlane, and I don't mean to interrupt. But it would be more helpful to us that if you refer us to the evidence where these statistics are used and then go on with your explanation.

I believe you are talk -- well I don't know. Where is this talk of New Brunswick on a per capita basis? I see per worker on page 4 above the public electricity debt. But where are you talking about?

MS. MACFARLANE: Those are the references that I am referring to. As an example, at the top of page 4, he says, New Brunswick's electricity debt relative to the size of the provincial economy is almost twice that of Ontario. And then as you have pointed out, he does an analysis to look at public electricity debts on a per worker, or as I have referred to it, per capita basis.

But what he fails to recognize is the electricity intensity of the New Brunswick economy. That electricity intensity, both because of the nature of our industry and because of our high space heating load, requires a larger infrastructure per capita in New Brunswick. And with that higher infrastructure per capita comes the higher debt per capita.

CHAIRMAN: Is that $13,000 per worker an up to date figure, to the best of your knowledge?

MS. MACFARLANE: I would suggest all of the data in this report is coming from that DBRS 1996 report.

CHAIRMAN: Do you have the, for instance, Ontario cost per worker?

MS. MACFARLANE: I do not have it. I can get that information.

CHAIRMAN: I think it is helpful to the Board, since you point these matters out, that you give us that other benchmark.

MS. MACFARLANE: I certainly can.

CHAIRMAN: Or maybe even if in that report it gives them across Canada, that would be even preferential that the entire thing be filed with the Board so that we can compare it with the other provinces on an apples to apples basis.

MS. MACFARLANE: Certainly.

CHAIRMAN: All right. Go ahead.

MS. MACFARLANE: I just made reference to the fact that our electricity intensity on a per capita basis is higher than the rest of Canada and therefore, we require a larger infrastructure. I would also like to point out that the infrastructure investments in New Brunswick have been made

to reduce dependence on price volatile heavy fuel oil.

New Brunswick is not in a hydro rich region. These investments have meant that our costs in our region have been lower than other utilities in that northeast area, I am talking about Nova Scotia, PEI, Maine and the northeast, none of which are in hydro rich regions.

So the investments that have led to the debt have put us in a better cost position relative to our neighbour utilities.

Fourthly, I would like to point out that Mr. Adams does -- again, he refers to DBRS, saying that NB Power has high and excessive debt. And part of this issue, he is indicating, is high in total -- in respect of the total capital structure, NB Power is 100 percent debt financed. But DBRS, itself, in this report and in successive reports, does make reference to the fact that New Brunswick Power is in an atypical situation. It does not have access to share capital.

We can only increase our percent equity through earnings. And because of the electricity intensity of the economy, that I mentioned earlier, our owner is very sensitive to rates, because of the impact on the economy. And we have what in fact DBRS has referred to as an artificially low rate cap -- pardon me, interest coverage

cap, relative to other crowns and private sectors, partly because of that electricity dependence and the concern of the owner of rates on the economy of the province of New Brunswick.

And finally in respect of the comments Mr. Adams has made, I would like to point out that NB Power has 82 years history of comfortably serving its debt and we will do so with even more ease after the major projects at Coleson Cove, which will reduce our operating costs and improve our cash flow situation and after the Point Lepreau refurbishment, where our costs and our cash flows will be more stable and more predictable.

MR. MORRISON: Ms. MacFarlane, I would ask you to turn to page 5 of identification 6. And it is under the heading, "NB Power's running cost is uncompetitive". If you look to the second paragraph under that heading, there is a statement which says in its February 1996 study of public electric utilities in Canada, the Dominion Bond Rating Service, DBRS, then found that NB Power had the highest variable and semi-variable cost structure of the utilities studied.

He goes on to say, the first sentence of the next paragraph, NB Power has the highest running cost of any comparable utility in Canada.

What, if anything, do you have to say about those statements?

MS. MACFARLANE: Thank you. My first point again is that the data is out of date. When DBRS makes comments with respect to NB Power's operating costs, they are measuring those relative to other utilities on a cents per kilowatt hour basis. Now in a cents per kilowatt hour there are two figures. There is the numerator, which are the costs, and the denominator, which are the volume sales or the kilowatt hours.

And even in the report from which Mr. Adams quotes, DBRS does say, the utility can drive down its semi-variable and variable costs by volume sales increase. Most costs are semi-variable with degrees of fixed characteristics, hence sheer volume increases can drive down NB Power's variable costs.

That was in that 1996 report. And since that time, we have increased our volume by some 2 terawatt hours since that report was issued.

Remember, in 1994, '95, Belledune was just coming on. It was built with excess capacity at the time, but the expectation that it would service future load increases, load that in fact is there today. So the data, as I say, I believe Mr. Adams has chosen to use data that is out of

date.

Secondly I would like to say that our costs in the most recent report, the one in fact the Board has, are comparable to like utilities. Our costs are lower than Nova Scotia Power. Our costs are lower than Saskatchewan Power, a hydro with -- or pardon me, a utility with an infrastructure not unlike ours. Our costs are lower than the northeast United States. In fact the only Canadian utilities where our costs are not lower are those with hydro resources. BC Hydro, Quebec Hydro, Manitoba Hydro, Newfoundland. Those utilities whose cost structure is very low because they have access to vast hydro resources.

And finally, I would like to point out that Mr. Adams has completely missed the point that the intent of these projects, the Coleson project and the Lepreau project, are to lower our operating costs, and in the case of Lepreau, in particular, to ensure stability and consistency in those costs on a go forward basis.

Q. - Thank you. Would you turn now, please, to page 8. I will be dealing with the second and third paragraphs on page 8. And the second paragraph, the first sentence of that paragraph states, "Although NB Power's accounts starting in 1999 acknowledge the cost of the reduced life expectancy, the utility has not made a corresponding

increased charge by recognizing the liabilities associated with cleaning up and dismantling or decommissioning the station after its use."

The evidence goes on to say in the next paragraph, "The impact of this discrepancy was not revealed until NB Power filed its testimony before the Public Utilities Board on February 25th 2002."

What, if anything, do you have to say about that, Ms. MacFarlane?

MS. MACFARLANE: Well first I would like to point out that in fact these matters have been disclosed. They have been disclosed in NB Power's audited financial statements in the annual report. In particular the issue related to the change in these costs depending upon whether the decision for refurbishment is to proceed or not to proceed, and the magnitude of the variability in our earnings as a consequence, has been disclosed. It is in the 2001 financial statements in Note 1-m. It is also in the 2002 financial statements.

But I did want to take a moment, if I may, and look at the interrogatories which address specifically why this issue was not recorded through an accounting adjustment.

If I could ask the Board to look at exhibit A-5. I'm on interrogatory PNB-80. And the interrogatory PNB-80 is

exactly on this issue. "Why were these charges not revised to reflect a 2008 date when the writeoff of the $450 million occurred?"

And I will draw your attention to the response under item A. And I will start by saying these are complex matters that required significant study and reliance on consultants' work with auditors and work with financial professionals with our owner.

But I'm reading now. When the consultants' study that addressed the life of Point Lepreau was released, the first issue attended to was the recoverability of the net book value of the plant which led to the $450 million writeoff in 1999. In fact the final conclusion of how that would be treated was in June 1999, just before the audited financial statements were signed off.

This was, as I say, a complex matter that took months and months and months of work with accountants, auditors, professionals in the Provincial Government Department of Finance and our own staff. The dollar magnitude was of such importance that it, as I say, required significant study and took significant time to resolve.

When this accounting issue was resolved, and I'm reading again, attention was turned to the provision for used fuel management and decommissioning. Because the

Hagler Bailly study also recommended that we change the life on those liabilities.

Work was commissioned to update these estimates -- the estimates for these provisions. However by the time the work was completed, and in fact the studies have been filed, work was completed by TLG Services in the fall of 2000, discussions were under way with AECL regarding the feasibility of refurbishing Point Lepreau to extend its life and the comprehensive assessment project was being scoped.

It was increasingly uncertain whether the life of the plant would ultimately be reduced or extended. And remember that these estimates in the financial statements are to be based on management's best estimate of the life of the plant.

At this point it was becoming more and more apparent to management that there was a case to be built for refurbishing Lepreau and extending its life. But there was uncertainty about whether or not that decision would go forward.

Rather than change the accounting provisions, because in fact they did have a significant impact on our bottom line and could if reversed have another significant impact, a measurement uncertainty note was added to the

financial statements to inform the reader of potential changes to the provision if the decision taken were ultimately to refurbish or not refurbish. And again this was done in consultation with our auditors.

Q. - Ms. MacFarlane, I have one final question with respect to the Energy Probe evidence. And it is on page 9 of identification number 6. And it is the last paragraph on that page.

The evidence states, and I quote "The utility estimates its costs for waste disposal and decommissioning at $843 million in 2001 dollars." It goes on in the next sentence to say that "NB Power only recognizes 221 million in provisions for these future costs."

What if anything do you have to say about that statement?

MS. MACFARLANE: Well, here I would really like to challenge Mr. Adams' understanding of finance and economics. The amount disclosed in our financial statements as a liability, as described in the notes to the financial statements, is like an annuity. It is an amount collected through rates that over time, together with interest, will ensure that the costs are provided for when they are incurred in the future.

In fact in the interrogatories on the net present

value of the liabilities today, we have indicated in our responses to those interrogatories that the net present value of the $843 million liability is $107 million. NB Power could set aside in an investment account today $107 million.

And that amount, together with interest over the next 60 years, which is the period of time, if the plant is refurbished, by which those -- the period of time by which those costs would be incurred, that amount would be sufficient to fund those liabilities at that time. That is in PNB-60, the response to that and PNB-16 in the supplementary interrogatories.

By suggesting that we would have to recognize an $843 million liability today for what in effect is a net present value of 107 million, by suggesting that we would have to recognize a liability today of 843' for something that is going to occur in 60 years, this discloses Mr. Adams' lack of understanding of basic economics and finance, his lack of understanding of the time value of money.

MR. MORRISON: Thank you, Ms. MacFarlane.

Those are all the questions I have, Mr. Chairman, with respect to the Energy Probe evidence. There are two -- and I'm looking for the Board's guidance on this issue.

There are two other questions I would like to put to the panel.

They arise out of two questions or two issues that Mr. Hyslop put to Panel A. They are certainly issues that, in reviewing the transcript, require clarification if the true picture is to be known to the Board.

The problem I have -- the dilemma is this essentially. If Mr. Hyslop does not put those questions to Panel B, then that clarification will not come before the Board. And of course, if those questions aren't put to Panel B and the issues don't arise in Panel B evidence, I will be denied the opportunity for redirect on those two issues.

They were questions that were put to Panel A. They were indicated that they would -- unfortunately Panel A did respond, although it was indicated that these were questions that were appropriately to be addressed to Panel B. I can advise the Board what they relate to.

There was a question to Panel A dealing with the $234 million net present value advantage over gas. And I believe Mr. Hyslop indicated that this is only a 3 1/2 percent difference. That is one issue. And the second issue was with respect to the CANDU next generation as an alternative to Lepreau.

So those are the two questions. I can either deal

with them now, unless Mr. Hyslop undertakes to put those questions to this panel during his cross-examination of that panel.

CHAIRMAN: Mr. Hyslop, do you want to comment on that? You are hidden by the pillar.

MR. HYSLOP: 16. Yes, Mr. Chairman, I think it is almost absolutely certain we will be dealing with the issue of the CANDU next generation reactor with this panel as an option.

And on the 3.5 percent difference, I would want to take the time to look at the transcript and look at the question I asked before I made comment on whether I would give an undertaking in reaction to that.

But I would be prepared to let Mr. Morrison know on this over the noon hour break at the latest, so that he can proceed if he does have a question at this time for Panel B.

CHAIRMAN: Thank you, Mr. Hyslop.

MR. MORRISON: Thank you, Mr. Chairman.

CHAIRMAN: All right. So there are no other matters that the applicant has before we start cross-examination of the panel?

MR. HYSLOP: No, Mr. Chairman.

CHAIRMAN: Okay. We will take our 15-minute break in order

to give Mr. Coon -- hang on, just a sec'. I'm sorry. AECL?

MR. HAYES: No questions.

CHAIRMAN: Do the Canadian Unitarians for Social Justice wish to go now or later on in the --

MS. FLATT: Mr. Chair, I would appreciate it if I might be able to go now.

CHAIRMAN: Okay. Well, would you like to come up to mike number 13 then --

MS. FLATT: Thank you.

CHAIRMAN: -- and ask your questions? Yes.

CROSS-EXAMINATION BY MS. FLATT:

Q. - Thank you. I would like to refer to A-5, please, NBP CUSJ-3. It is indicated that a significantly higher cost would ensue to avoid similar amounts of emissions that are avoided by refurbishing Lepreau. I would like to look at this significantly higher cost issue. In particular, I have a question in light of the most recent federal incentives for wind generation. Does the wind option look a little bit better in the line of possible utilities or options that we can look at?

MR. MARSHALL: The recent federal incentive program will make -- it's a production credit. It will make 1.2 cents available for projects that come on line before March of

next year. It will make a one cent a kilowatt hour credit available to projects that come on line out to 2006. And it will make a .8 cent per kilowatt hour credit for projects that come on line before March of 2007.

In the evidence the information on costing of projects is given in appendix B-2 of exhibit A-1 -- sorry -- appendix B-1, the integrated resource plan, page 19, table 3-5, it's the table of power cost comparisons of all of the options. If we look at the wind generation down under the alternative energy options, we can see that the life-size -- levelized life cycle costs of wind as evaluated at this point in time with a 32 percent capacity factor was 7.33 cents a kilowatt hour. If we take into account one cent a kilowatt hour credit, because we can't get it operating by next March, it would have to be operating and take advantage of the second tier, one cent a kilowatt hour credit. That would reduce its costs to 6.33 cents a kilowatt hour from a New Brunswick perspective.

In comparison the Point Lepreau refurbishment cost is 5.01 cents a kilowatt hour on the first line on that table.

So it does lower the costs and bring it closer to Lepreau refurbishment costs, but it does not make it better.

Q. - Thank you. I have a few questions in regards to this table and as well in regards to the power cost comparisons that were submitted as part of the evidence for the Coleson Cove hearings. Is there a number for the Coleson Cove evidence for the power cost comparisons? It was from A-6 in the Coleson Cove hearings. No, there is no number. May I refer to those tables or --

CHAIRMAN: Well we would have to put it in evidence in this particular hearing. My suggestion to you is to show it to Mr. Marshall, ask him for his comments on it and indicate to him, as you have, that it came from the Coleson Cove hearing and let's see what he has to say about it.

MS. FLATT: May I take a minute to do that right now, Mr. Chair?

CHAIRMAN: Yes. Give it to him, Ms. Flatt. Let him look at it, see if he recognizes it and any comments he might have on it. In other words, I'm hopeful that there might be something filed with this particular hearing that will cover what you want to get at, and I know Mr. Marshall would be able to recognize that.

MS. FLATT: It was suggested that I do put this in as evidence, the Coleson Cove power cost comparison tables. I do have 20 copies of it.

CHAIRMAN: Okay. Let's just see -- well all right, let's

carry on with this this way. Perhaps if you could get the assistance of the Secretary, if she can assist you in getting them out to the parties and then we will deal with it.

Mr. Morrison, have you any objection to putting that in evidence?

MR. MORRISON: No, Mr. Chairman.

CHAIRMAN: Okay. Then the document which Ms. Flatt has just handed around which is headed "2.4, summary of option parameters", will be given exhibit number CUSJ-1. Go ahead, Ms. Flatt.

Q. - Thank you. What I wanted to do when looking at these tables is to look at the wind generation alterative energy options at the bottom of page 56 on CUSJ-1, and also page 52 in the wind generation.

In comparison to the table of -- that is in A-1 on page 18, which is basically entitled the same table, summary of option parameters and power cost options, I'm noting that under wind generation that the numbers are all different. There doesn't seem to be anything similar in regards to the capacity, the capital cost -- oh, the expected life year, yes, is definitely the same.

I'm wondering what accounts for such a great difference in the numbers.

MR. MARSHALL: Well wind energy/wind generation is an evolving technology. The evidence in CUSJ number 1 which was part of the Coleson Cove hearing was prepared in October and filed I believe the end of October or the first of November in the Coleson Cove hearing. We had just begun doing wind monitoring at Lameque in September. The Prince Edward Island project was just finishing. The information filed in the Lepreau hearing was filed near the end of February. We had access to better information. So the wind data was adjusted and modified and we made note of that in the -- if I might direct you back to page 17 of the integrated resource plan, at the top of the page, where we say that the parameters and costs illustrated and used in this study are identical to those in Coleson Cove except for wind, the new Orimulsion and natural gas combined cycle, and there are some minor adjustments.

The difference in the size -- all of the costs are on a per unit basis on dollars per kilowatt. So the energy costs are not affected by the size of the project. Originally we had a 25 megawatt project because that's the total capacity of what might be in the Lameque area. In this one it was adjusted to 12. I think that was our current thinking of the initial size of a project we would

put at Lameque.

The costing of that is based on the costing of the five megawatt project that has been completed in PEI. We got detailed information from that.

Now that's my understanding subject to check, that that's the reason for the change in the actual cost numbers.

I also note that the change in the availability of energy under the Coleson evidence, the capacity factor that was put in, and you have given only table 3-1, if you gave on the other side of the page then table 3-3, the capacity factor for wind was 30 percent. And in the Lepreau evidence, the capacity factor has been increased to 32 percent. That was based on a few months of monitoring data that we had from actual measurement of data at Lameque. And right now if we go back and look at what data we have over the whole year, we still have another four months of data to collect through the summer. So depending upon summer numbers we would think that the capacity factor would be even a little higher than the 32 percent, probably about 34.

Now when you take all of this into account, the costs of the 7.33 may come down slightly and you take one cent credit from the federal government production credit

program, you might get it down to six cents. There is still a cent difference between the wind generation and Point Lepreau.

Q. - Still on this table, I do still have a question regarding the capacity. What is the reason that the capacity has gone down from 25 megawatts to 12 megawatts?

MR. MARSHALL: The capacity was evaluated based on the total cost of a 12 megawatt project which we were specifically looking at as an initial project size for Lameque. The actual evaluation in the model was for 100 megawatts of wind generation, not 12. So we have evaluated a hundred megawatts of wind as an option in our modelling. This costing is based on the -- an initial 12 megawatt project at Lameque. I should say based on the best information we had in February for that.

Q. - Do you have other information now that would change this table again?

MR. MARSHALL: No, other than the capacity factor number I already said may increase to 34 or 35 percent, but we still don't have the data for the rest of the year yet.

So that's the only thing that I currently have data that might change. We don't have any more cost data. And, as I say, the government production credit, you take that one cent would lower the overall power cost by one

cent.

Q. - I'm interested in looking at the capital cost that you have noted on table 3-4, page 18, $1,790 per kilowatt?

MR. MARSHALL: Yes.

Q. - I'm wondering if I might be able to refer to a document that has been used by the Canadian Wind Energy Association. Perhaps I might be able to submit it for referral, to identify it.

CHAIRMAN: Certainly you can mark it for identification. Mark the document which the cover is called Wind Energy Basic Information. It will be marked for identification number 7.

Have you given them all out? The witnesses need one. Okay. We will share from here. I think that is fair enough. Okay. They have one. They actually have two now.

When you are referring to this document, just call it identification 7. It is the easy way to do it.

MR. MARSHALL: Why wouldn't it be CUSJ-2?

CHAIRMAN: Pardon me?

MS. FLATT: It is for identification. I'm not entering it as evidence.

Q. - This document was available at a course that I took at the Kortwright Centre for Conservation. It was prepared,

as you see on the last page by MSC Enterprises, published by the Canadian Wind Energy Association with support from the Canadian Centre for Mineral and Energy Technology Branch of the Department of Natural Resources Canada. This was a course that was given in 2001.

I'm interested in looking at page 13, the very last page of the document, the formula that is used to calculate the cost of energy.

Is this the formula that you used in calculating the cost of energy for your wind power?

MR. MARSHALL: The methodology that we have used -- it looks familiar. If the annual cost is a levelized annual cost then that would be correct. And our methodology is laid out in detail in response to CCNB-79 in volume 7, Panel B.

Q. - Yes. I have seen that one. The reason why I'm interested in looking at this document is because, as I was looking through it, I noticed really the last paragraph it mentions that for the larger units the cost is about $1,200 a kilowatt.

I was interested in that number as the cost in your tables is significantly higher than this for your costing -- for example 1,790 was your estimate.

I'm wondering what is the difference in the windmills that you were looking at compared to the wind farm

windmills that this document was referring to?

MR. MARSHALL: I don't know exactly which documents -- which windmills this is referring to. But when it says larger units -- currently wind turbines, the current large size units are up to 2 1/2 to 3 megawatt size units.

The project in Prince Edward Island uses Vestes machines that are 660 kilowatts for each unit. So there is economies of scale on the size of the unit.

If you are going to construct a wind farm there are issues around what size capacity of a unit you are going to actually install. And much of it depends upon the actual infrastructure of the roads that get access to the site. Because you need to have super large cranes to be able to go in and to put up these very, very large sites.

And there are -- there are limits as to what you can do. The position in PEI when they chose the Vestes machines was because they could not get any larger cranes even into the area to do a bigger machine.

So you have to look at the specific site, where the wind is, what is the size of the unit you can get in there, and balance the two to get the lowest cost option.

Q. - So what size generator did you use in calculating the table 3-4?

MR. MARSHALL: The same ones as in Prince Edward Island, the

Vestes 660 hundred kilowatt units.

Q. - And you are suggesting that the wind farm applications were much higher than --

MR. MARSHALL: I would think that these ones are for -- and they are saying our larger units mass-produced might be $1,200. The other point is $1,200 when. Ours are in-service costs in 2006.

So the question is when this document was produced. And the time value of the money also would adjust the cost.

Q. - Yes.

MR. MARSHALL: The key point is that even given that, they are suggesting here that the energy costs are about 6 to 8 cents a kilowatt hour in moderately windy locations. That is consistent with our evidence.

Q. - I would like to again refer to this document on page 3. It discusses the windiest areas of Canada are along the east and west coasts.

I would like to just look at the wind speed that has been measured in Canada. And I know it is a little difficult to see.

But I'm noting that in the Bay of Fundy it does look like that the winds are fairly brisk as well as on the east coast of New Brunswick. It seems like we have a 20,

possibly a 25 line there.

Is that a considerable wind speed?

MR. MARSHALL: The -- a mean wind speed of 20 kilometers an hour is reasonable. You will notice that the 20-kilometer line going through the east coast of New Brunswick crosses the tip of the Miscou/Lameque Island area. We identified that as probably the most likely, the best wind location in New Brunswick. And that is what we have evaluated.

I would just like to correct your reference to the Bay of Fundy. The Bay of Fundy area, you see that the 20-kilometer line goes out around Nova Scotia, so that the entire Bay of Fundy area is somewhere between 15 and 20. Now the line also tips back in around the Grand Manan area. So that we would expect 20-kilometer winds in Grand Manan.

So there are some good sites in New Brunswick to look at wind. And we are undertaking monitoring at some of those sites now in order to mine the wind data to get good data so that we would look at putting up some wind farms in areas where there is good wind.

Now the one thing to look at wind, this gives an indication of average wind speeds. It is crucial that you actually put up a tower specific to the location and measure the wind exactly where you are going to put the

wind farm and at the height that you are going to put the wind turbines to really know what the wind is. And that is what we are doing at Lameque.

Q. - Would you consider looking at these options and these charts and upping the size of the generator that would be possible to use and then look at the cost?

As I do note that the cost of power does definitely -- it goes down the higher, the larger the size of the generator.

MR. MARSHALL: As I say, we are undertaking the study now at Lameque. The process is to get the best wind data available so you know how much energy you can extract from the wind.

You look at the site and you do detailed costing on access to the site and what size units you can put in and size the units to get the wind energy at the lowest cost. We are in the process of doing that.

And we will be looking at that through this fall at Lameque when the study is done after one full year of data collection. And we are looking at collecting data in some other sites and areas of the province as well.

MS. FLATT: For a larger size generator or --

MR. MARSHALL: We -- once we have the wind data we will look at what is the lowest cost way to extract energy out of

that wind.

If that is with a larger unit, if you can put it in, or with smaller units you might be able to buy at a better price, we will look at what is the lowest cost way to generate energy from that wind resource.

Q. - Are you familiar with the 5-megawatt offshore wind generators that are currently available on the market?

MR. MARSHALL: No, I'm not. I understand there are some offshore, large offshore machines off of Denmark which are just being constructed. I do not have all the technical details on them.

Q. - Would I be able to submit information regarding these 5-megawatt generators that are now available? I understand a much lower cost.

CHAIRMAN: What I'm going to do is take the Board's 15-minute break. And I will ask you to approach Board counsel during the break as to how you might be able to do that.

I'm afraid that you are going to have to have a witness recognize it or you won't be able to get it in as evidence. That is the nature of the beast. But anyway, speak with Mr. MacNutt.

We will take a 15-minute recess.

(Recess - 11:00 am. - 11:15 a.m.)

CHAIRMAN: Back on. Okay, Ms. Flatt, go ahead. Number 13 mike.

Q. - Thank you. Yes, Mr. Marshall, before the break you noted that in regards to wind generation that perhaps as the studies come in and you are more aware of more efficient turbines and larger turbines that we are capable to -- are capable to be put up, that perhaps the cost will go down.

MR. MARSHALL: Is that a question?

Q. - No, I'm asking -- I'm just refreshing my memory of what you -- you said to me before the break. Perhaps it will be necessary to refer to that, or I could ask you the question again.

MR. MARSHALL: Well I would prefer a question.

Q. - Okay. Is it true that as the studies come in and as you become more aware of greater efficiencies available in wind technology, that the cost per kilowatt hour will go down?

MR. MARSHALL: It's expected that there are -- have been improvements in wind technology over the last 20 years that with economies of scale in mass production that unit costs should go down in the future.

The issue here is we are here to determine whether or not what capacity we need to replace Point Lepreau in 2006. We have 635 megawatts there. And we have a

deficiency of over 400 megawatts by 2010.

The state of wind technology in 2010, or 15, or 20 as to where it gets down, is not relevant to the requirement that we have to provide supply to New Brunswick in 2006.

The information that we have presented is the best information that we have available to us at this time for commercially available wind technology that we can put in place to -- to meet the needs.

Q. - Are you aware of the Hydro Quebec Windfarms?

MR. MARSHALL: I'm aware they have -- have a windfarm in the Matan area.

Q. - What size of generator, do you know that they -- wind turbine generator do they use?

MR. MARSHALL: I'm not quite sure, subject to check it's similar in size to the ones in PEI. They have two different sizes, I believe. But they are -- they are not in the 2, or 3, or 4 megawatt size or the large size that people are talking about moving to. That technology is not commercially yet available.

Q. - That statement, is that a fact that you are aware of or is that in your best opinion that these larger sizes are not commercially available?

MR. MARSHALL: Some of the larger sizes are just becoming available now. And they are -- are moving to -- to larger

size units. And as you mentioned earlier, there are some units being developed for offshore. Much larger units in an offshore type of a -- they -- we are not aware of that technology, the costing and the availability of that technology. And we do not have wind data at sites in New Brunswick yet in terms of being able to -- to do it. We are -- we presented evidence on the best information that we have for what we consider to be one of the best sites in the province.

Q. - In regards to not having wind data, my question would be, are you referring to wind data for a single mill, windmill or wind data for a location, a viable location for a windfarm?

MR. MARSHALL: Well, as I said earlier, wind technology is expensive. And you are not going to invest the money in a turbine and put it up until you are reasonably assured that there is wind in that area and you will get an assurance of energy from that turbine. So anybody that's developing windfarms today, whether it's a large single unit or -- or farms, do at least one full year of monitoring of wind speeds at the hub height of the turbines prior to committing to construction of facilities. And that's the state that we are currently in.

Q. - Are you aware of any private company that would be interested in working in a partnership with NB Power to develop windfarms in offshore or onshore?

MR. MARSHALL: We have had discussions with different windfarm developers.

Q. - Have those private developers been confident that the area around New Brunswick is a suitable area for windfarm in regards to wind speeds?

MR. MARSHALL: They think there are reasonable possibilities. And they hold the same view that I just expressed. They want to do monitoring of at least a full year of data prior to going forward with -- with the project.

Q. - You mentioned some areas that would be possible areas for such farms around New Brunswick. I'm trying to remember what areas. You have mentioned Lameque and Grand Manan. Is that correct?

MR. MARSHALL: Yes. We are looking right now at monitoring wind in four areas of the province. Grand Manan, the Tantramar area, and in the Escuminac, Baie Saint-Anne area, as well as Lameque, Miscou. Those are the four areas of the province we have identified that likely have the greatest wind potential. And we are undertaking to do additional work, other than what we are doing at Miscou,

doing more work in these other areas as well.

Q. - If you did calculation for a larger capacity turbine, and if the cost per kilowatt hour was closer to the 5.5 cent range, would that put wind higher up on your agenda of studies to do?

MR. MARSHALL: We see wind as a -- as a viable technology to meet our obligations under greenhouse gases. We see it as a reasonable technology, as an emission free technology. It's already high on our agenda today. And we are undertaking, as I said, monitoring at all of these sites and getting the best information available with which to go forward to do -- do projects that will fit into our long term plan to provide electricity for New Brunswickers at the lowest cost.

Q. - My final question in regards to just the summation of this. Would you in the future undertake -- in the near future undertake calculating -- recalculating your power costs comparisons using perhaps the five megawatt off-shore wind turbine that is now available commercially?

MR. MARSHALL: We will monitor the wind. And as I said earlier, given the locations where we -- we see we get the best wind resource, we then would look at what is the lowest cost way to extract the energy out of that wind. And we will look at all available wind technologies to do

that.

Q. - And would the larger turbines offer the lowest cost?

MR. MARSHALL: Possibly. But it is not certain. The cost is not just the cost of manufacturing the turbine unit in the factory that is so many dollars a kilowatt. The costs include how do you transport it, how do you erect the tower, how do you get it up on top of the tower, how do you get it all in place ready to produce energy?

We have to factor in all of those costs to look at what the bet option is. The best option is not always necessarily the biggest.

MS. FLATT: Well, we will be looking forward to those studies. Thank you. That is all my questions, thank you.

CHAIRMAN: Thank you, Ms. Flatt. If you would like to give up your place I guess maybe it is Conservation Council. But I will check my list.

Mr. Campbell, does the City have any questions?

MR. CAMPBELL: No questions, Mr. Chairman.

CHAIRMAN: Thank you. Okay, Mr. Coon, Conservation Council.

MR. COON: I just want a few minutes.

CHAIRMAN: By all means. Take your time.

CROSS-EXAMINATION BY MR. COON:

Q. - Good morning. Good morning, panel members, that is 13, is this on now? Yes, okay. Mr. Marshall, I would like to

start with just a few questions around the actual size of the shortfall in generating capacity that is expected.

In terms of meeting in-province needs, what are you estimating NB Power's shortfall will be in generating capacity in 2006 when Point Lepreau is scheduled to be shut down?

MR. MARSHALL: That was dealt with in the -- in the generic hearing last year and submitted in that evidence. I don't have it with me right at this time. But I believe it is initially in 2006, it is a little over 300 megawatts, I think at that point in time. And it grows to 438 megawatts in 2010.

Q. - Now during the load forecast hearings you assured us while we were doing cross-examination that this question of how much capacity and energy would actually be needed when Lepreau was shut down would be dealt with at this hearing.

So I am assuming that you have access to that information and we can continue. So in terms of meeting in-province requirements in 2006 when Point Lepreau is shut down, what would be the energy shortfall, shortfall energy, somewhere around 300 megawatts in capacity. What would be the energy shortfall?

MR. MARSHALL: First of all, from an energy point of view,

Point Lepreau is dispatched as a base load unit. So the removing Point Lepreau from the system will require all of the energy that Point Lepreau produces.

Q. - That wasn't my question. My question was, what would be the shortfall in energy to be supplied to meet in-province requirements?

MR. MARSHALL: We do not calculate a shortfall on an energy basis.

Q. - Can it be calculated?

MR. MARSHALL: I don't know in any meaningful way you can calculate a shortfall in energy other than the total capacity of the system, what is the capability of the total capacity of the system to produce energy. And then if you take out the Point Lepreau capacity, what is the total capacity of the system without it to produce energy, you will get the energy that would be capable of being produced by Point Lepreau as the difference.

So the shortfall would be the total base load energy produced by Point Lepreau.

Q. - Now how can we have a shortfall in capacity of 300 megawatts without Lepreau, but a shortfall in energy equivalent to more than double that figure?

Surely the shortfall in energy is related to the shortfall in generating capacity of 300 megawatts.

MR. MARSHALL: As I said, we don't calculate on that basis. If you take it at that level of let's say the capacity required only at load plus reserve and then the capability of that capacity to produce energy, you would take the 300 megawatts at 100 percent capacity factor to determine an amount of energy.

Q. - Would you please undertake to provide that information for us, do the calculation and get back to us?

MR. MARSHALL: It would be 300 multiplied by 8.76.

Q. - Well we can do it now or can do it later. I just want the number?

MR. MARSHALL: It is about 2.6 terawatt hours.

Q. - Because I will be going through this, to keep straight terawatt and gigawatt and megawatt hours and kilowatt hours, can you translate 2.6 terawatt hours into gigawatt hours please?

MR. MARSHALL: That would be 2600 gigawatt hours.

Q. - Thank you. Now, Mr. White in Panel A under cross-examination said that New Brunswick Power's generating resources without Lepreau are adequate to meet in-province load in the spring and the summer and the fall. Is that correct?

MR. MARSHALL: Yes.

Q. - So the shortfall of around 300 megawatts in 2006 that you

referred to, or around 2600 gigawatt hours in energy is a shortfall in the winter months without Lepreau. Is that correct?

MR. MARSHALL: That is correct. The capacity requirement is to meet the peak firm load for an hour plus 20 percent reserve margin. That is the capacity criteria.

Q. - So if we have adequate generating capacity to meet in-province load for spring, summer and fall, what are those things in the winter that contribute to the increase load which would cause the shortfall in capacity?

MR. MARSHALL: Could you rephrase that question, please?

Q. - Sure. Therefore in the spring, summer and fall our generating resources without Lepreau are adequate to meet our in-province load. When we get to the winter months our generating resources are no longer adequate according to the evidence to meet in-province load. And my question is why, what is the difference in the winter?

MR. MARSHALL: Because the load, the provincial load is higher in the winter than it is in the summer.

Q. - Yes. But what are those -- what are the elements in the winter that cause the load to be higher?

MR. MARSHALL: The less light. More use of electricity for lighting. More use of electricity for cooking. People usually don't barbecue in the winter. More use of

electricity for space heating.

Q. - As the Public Utilities Board noted in their decision on the updated load forecast, this hearing has been convened to look at the best way to address the shortfall in capacity to meet in-province load for the next 10 years in the absence of Point Lepreau by way of additional supply or reduction in load. Is that your understanding?

MR. MARSHALL: Again, could you repeat that? I missed the first part of that.

Q. - I am just reading from the decision on the load forecast hearing. The PUB noted in the decision that on the updated load forecast this hearing has -- this hearing has been convened to look at the best way to address the shortfall in capacity to meet in province load for the next 10 years in the absence of Point Lepreau by way of additional supply or reduction in load.

MR. MARSHALL: Yes.

Q. - So therefore we will be looking at means to provide additional supply or reduce the load. Is that correct?

MR. MARSHALL: Yes. We --

Q. - So in your evidence in -- you don't need to turn to this -- but in appendix B-1, which we will dealing with a lot, there is this table 3-5 which provides your estimates of NB Powers costs to provide additional supply from about

14 different supply options.

You can turn to it if you want. It is on page 19 in your appendix B-1 and exhibit A-1 of the evidence.

MR. MARSHALL: I have it.

Q. - So here you provided your estimates of NB Power's cost to provide additional supply from some 14 different supply options ranging in capacity from 12 megawatts I think for wind to 685 megawatts, is that correct?

MR. MARSHALL: That's correct. But as I stated earlier the 12 megawatts for wind was an evaluation number. Actually 100 megawatts of wind was considered in the model.

Q. - Thank you, Mr. Marshall. So here you have estimated NB Power's costs for meeting the shortfall in terms of providing additional supply. Now I have searched the evidence and I cannot find in the evidence your estimates of NB Power's costs to reduce the load through energy efficiency programs or fuel switching programs, is that correct?

MR. MARSHALL: No.

Q. - If you could direct us to --

MR. MARSHALL: On page 16 --

CHAIRMAN: What exhibit is that?

MR. MARSHALL: The same exhibit, appendix B-1, the integrated resource plan, table 3-3 on page 16. The table

outlines four blocks of demand side management, 110 megawatts each, 350 gigawatt hours, and the costs of those blocks. Those were included in the detailed integration model and allowed to compete with the power supply options which you have pointed out on table 3-5, page 19. All of the options competed together to determine what is the lowest cost way to supply the load, either reducing the load or building capacity to meet the load.

Q. - Thank you. So my question then, these costs on page 16 you refer to, are these exclusively NB Power's expenditures?

MR. MARSHALL: These are the costs of achieving those -- of those demand side technologies.

Q. - Are these NB Power's investments exclusively?

MR. MARSHALL: Well these are the total costs of that block of DSM.

Q. - I'm asking you, Mr. Marshall, if this cost represents simply NB Power's investments to achieve this level of demand side management?

MR. MARSHALL: No. We do not have -- if you are referring to achieve it, the issue of whether incentive payments are included they or not. Those are the costs of those measures.

Q. - So these would include the costs of participants in --

and their costs in terms of insulating their basement or industry replacing motors or what have you, is that correct?

MR. MARSHALL: That's correct.

Q. - So we have a situation where you are trying to compare NB Power's costs of providing new supply, not with NB Power's costs of providing -- reducing the load but providing a comparison with New Brunswicker's costs of reducing load to NB Power's costs of providing supply, is that correct?

MR. MARSHALL: No, it's not correct. What we are trying to evaluate is what is the cost of customers meeting their needs. What is the cost of the electricity that's required to supply them if they use the electricity. Then we build power plants, we provide those plants to them. If --

Q. - Correct, Mr. Marshall, but what I'm after here is --

MR. MARSHALL: If I could finish, please. If the customer -- the customer has two choices. He can pay a power bill which includes the cost of the new resources that would be in NB Power's costs, or he can pay money to not pay that power bill. This is the money that would have to be paid in order to reduce the load to not pay the power bill.

Q. - Mr. Marshall, I would ask you that isn't it the case that NB Power has two choices. It can spend the money to

provide additional supply or it can spend the money to reduce its load, is that correct?

MR. MARSHALL: If it spends the money to reduce the load and then it cannot -- it cannot bill for the load that was reduced, how does it pay for that money that reduced the load?

Q. - I guess I'm asking the questions.

CHAIRMAN: Mr. Marshall, your counsel can ask for re-direct on these matters. We are going to be here all day dealing with this one subject matter if you don't attempt to answer Mr. Coon's questions as they are put to you. If you have further explanation you want to give after, why then Mr. Morrison will ask you for that. But you were responding to Mr Coon's question there with a question of your own, and that's not the way this process works.

MR. MARSHALL: I'm just trying to understand the question, sir.

CHAIRMAN: I think Mr. Coon is able to look after himself in that regard. Mr. Coon, put the question again, sir.

Q. - So -- and this gets back to my earlier question then. I would like to find where in the evidence is there information on what would NB Power's costs of achieving load reduction be compared to the costs of providing additional supply? Is there anywhere in the evidence

where you have provided estimates of your costs of reducing load as opposed to providing new supply?

MR. MARSHALL: No.

Q. - Thank you. There is one item I missed at the outset here I should clarify. On the gap, the 300 megawatt gap does that deal exclusively with in-province -- meeting in-province load requirements, or are there domestic export -- is there any domestic export load in that figure?

MR. MARSHALL: The -- in order to calculate that -- the gap there would be all of the capacity available that NB Power has available less -- and the load side would include all in-province load and firm power exports that are contracted at this time on a forward basis. So it only includes existing obligations.

Q. - So how many megawatts of that 300 would be accounted for by the external obligations outside of New Brunswick?

MR. MARSHALL: Well subject to check with the actual resource balance, there would be the 30 megawatts of PEI ownership in Point Lepreau, 20 megawatts of PEI ownership in Dalhousie, and there may be an additional contract, I'm not sure. And that's subject to check.

Q. - Okay. You can get back to us on that, but at this point for sure you are certain of 50 megawatts of that 300 megawatt gap that actually is related to external --

MR. MARSHALL: Well no, because the 30 megawatts at Point Lepreau is not there in order to have the gap. So that's not included in the gap.

Q. - So it would just be the 20 --

MR. MARSHALL: Just be the 20 from Dalhousie.

Q. - Subject to check.

MR. MARSHALL: Yes.

Q. - Okay. When you are checking, Mr. Marshall, if you could in reporting back just refer us to figure 2-2 of the integrated resource plan, page 5. Just -- there is a graph there, it can help us -- guide us through when you report back on what that amount would be. Thank you.

MR. MARSHALL: Yes.

Q. - In the cross-examination during the Load Forecast Hearings, Mr. Marshall, you agreed with me that it would be appropriate to pass on economic potential that you have identified for energy efficiency in your DSM analysis to this hearing. Do you recall that?

MR. MARSHALL: Yes, that's what we have done. It's on table 3-3 of page 16.

Q. - Yes. We will get there. But that was the case, that you would pass on economic potential energy efficiency identified in your analysis for the last load forecast into this hearing.

Now your DSM potential analysis identified an economic potential for reducing the industrial load in the province by 100 megawatts through improvements in energy efficiency, an economic potential, is that correct?

MR. MARSHALL: I believe that was covered in the last hearing, yes.

Q. - Yes. So my question is what would it cost NB Power to deliver the energy efficiency programs necessary to have your industrial customers make the necessary investments in energy efficiency?

MR. MARSHALL: The -- we have not calculated that number and I would like to explain why. The method of evaluating DSM is to do the analysis on a measure by measure basis that was done and submitted in the Load Forecast Hearing in terms of what DSM's costs are on a measure by measure basis. Then you sort out which ones are economic and you get a potential on economic.

Q. - This is 100 megawatts on the industrial side we are talking about?

MR. MARSHALL: And we get -- that gets rolled into these blocks of DSM on table 3-3, page 16. You then go and those -- the DSM competes with power supply options to determine which is the least cost and how much of that DSM is worth pursuing.

After you do that you then determine and compare to what your plan would be without the DSM to determine how much money you have left over to then invest in pursuing it.

Now this is the methodology that we laid down. This is the methodology that has been submitted to the external consultant for review. And it's my understanding that's the methodology that the external consultant has accepted as industry standard practice.

So we are at this stage now, Mr. Coon, to try to determine how much money we have left over. You have to compare the case without any DSM with the case with the DSM and then you decide whether or not you can spend that money and achieve the ends that you want.

MR. COON: I wonder if we shouldn't -- if we are going to refer to the -- this study the Board commissioned, that it shouldn't be entered into evidence as an exhibit, Mr. Chairman?

CHAIRMAN: I am a little concerned with -- I don't want to put it in evidence, and I will tell you why, is that we have -- the staff has indicated to the Board they have no intention of calling that individual as a witness, and I think that if that opinion evidence can be put in evidence, then it is in evidence and it should be subject

to cross-examination. Mark it for identification, don't see any problem with that. You can refer to it by doing that and ask the witnesses to comment on it, if that's the way you would like to go.

CHAIRMAN: Perhaps it would be wise to mark it for identification purposes but it's my understanding that it's therefore -- but it doesn't become evidence, actually like the other documents the Conservation Council submitted before which were marked for ident.?

CHAIRMAN: No, that's right.

MR. COON: Thank you.

CHAIRMAN: I don't think I have a copy of it. Do you want to do that now, Mr. Coon?

MR. COON: It can be done over lunch.

CHAIRMAN: All right. Why don't we do it over lunch. And we will make sure there are enough copies to go around.

MR. COON: Thank you.

Q. - Mr. Marshall, your DSM potential analysis identified an economic potential for reducing the load of your general service customers by 61 megawatts through improvements in energy efficiency. That would be 258 gigawatt hours.

What would it cost NB Power to deliver the energy efficiency programs necessary to have your general service customers make the necessary investments in energy

efficiency to reduce this load?

MR. MARSHALL: As I just explained, Mr. Coon, that would be the difference in cost -- how much it would take to have them achieve that, I don't know.

How much would be available to pursue those programs without increasing costs would be the difference between the analysis including the DSM and an analysis not including the DSM.

Q. - Now your DSM potential analysis identified an economic potential for reducing the load of your residential customers by 176 megawatts or 696 gigawatt hours through energy efficiency improvements.

Did you estimate what it would cost NB Power to expend to induce that load reduction by your customers?

MR. MARSHALL: The same response I just gave to the last question.

Q. - Now Mr. Marshall, isn't it true -- isn't it the case that in fact it doesn't really matter how much it costs me to invest my -- to insulate my basement if you have identified it as economically desirable or representing part of the economic potential. What is important is that I do it. And in terms of costs what is important is what it costs you to convince me to do it.

Whether I do the job myself and get the insulation on

sale somewhere, hire my brother-in-law and pay him under the table, which I wouldn't do, or go for the fanciest contractor in town because I like the kind of finish he puts over the styrofoam up above the foundation, that doesn't -- is it not the case that that is irrelevant.

What is relevant to NB Power is getting that basement insulated and what it costs you to induce me to do that?

MR. MARSHALL: No. What is relevant in integrated resource planning is what is the total cost of supplying the service to the customer. That includes the customer's costs as well as the electricity costs that they pay in their bill.

So the evaluations that we have done look at an average cost of a customer insulating their basement as a measure. And you look at that cost versus the savings that would be achieved of not having to buy the electricity to -- that would occur from the savings in energy.

And if the economics of insulating the basement, the cost of buying the material and insulating the basement cannot be paid back out of the savings in energy, it is not the most efficient thing for that customer to do. And it is not the most efficient thing for society to do.

Q. - Now what I understand from your answers here is overall

you identified in your DSM analysis about 270 megawatts of energy efficiency that is economic in the ground, correct?

MR. MARSHALL: In the Load Forecast Hearing there is a combination of energy efficiency and fuel switching --

Q. - I just want to talk about the energy efficiency part of that.

MR. MARSHALL: Could we have the evidence from the hearing and you could refer -- so I could refer to it?

Q. - We could go back. And we could just add up what I talked about. 100 megawatts through -- from industrial energy efficiency is economic.

And then we had 61 megawatts in the general service sector as economic energy efficiency. And then we had 176 megawatts as economic energy efficiency in the residential sector, which gives us 337 megawatts.

So you have built a portion of that into your load forecast, the naturally occurring energy efficiency, totaling about, if I recall, 64 megawatts of naturally occurring. So we can take that out because it is in the load forecast. And that cuts us down under 300 megawatts.

So what I understand, Mr. Marshall, is that nowhere in the evidence are there any estimates provided of what NB Power's expenditures would be to get that 273 megawatts of economic energy efficiency you have identified out of the

ground, correct?

MR. MARSHALL: I believe I already responded to that question. We have not calculated the differential costs or have we attempted to estimate the incentive payments required in order to achieve it.

MR. COON: Now I would like to distribute a document for identification purposes to refer to in cross-examination, Mr. Chairman.

CHAIRMAN: The document is headed "Efficiency Vermont". It appears to be their annual report for 2001. And it will be marked number 8 for identification.

MR. MARSHALL: What is the number of that?

CHAIRMAN: Identification 8. Go ahead, Mr. Coon.

Q. - In this annual report for 2001, Efficiency Vermont, which is the state's energy efficiency utility, reports on its costs, its expenditures to induce customers, to induce ratepayers to get the energy efficiency out of the ground. If I can refer you to the first paragraph on page 7 in this attachment --

MR. MORRISON: Excuse me, Mr. Chairman. Before we continue, I don't know -- perhaps it is just my copy. But it does not appear to be the entire report. It looks like there is an excerpt of only one page.

CHAIRMAN: Mr. Coon, is that correct?

MR. COON: That is correct. We were trying to save on photocopying costs.

MR. MORRISON: Well, I think in fairness, Mr. Chairman, if we are going to be asked questions on a report, that the -- I mean, I don't know whether there are other areas of the report which may qualify it or not qualify it.

CHAIRMAN: Do you have the original total report here?

MR. COON: Yes, I do.

CHAIRMAN: How would you like to share that with Mr. Morrison until you are through your questions on this, so that the witness may refer to any part of that document they want to, just to put everything in context properly. And that is not to insinuate that you are trying to isolate just one part of it.

Q. - So in the first paragraph on page 7 of ident. 8, it says, In 2001 Efficiency Vermont spent roughly $8.5 million to provide for monitors with services and financial assistance that generated 37,565 megawatt hours of annual electricity savings. There is two points here I want to refer to. One is the last sentence in that paragraph says, This means that Efficiency Vermont investments saved energy in 2001 at a cost of 2.5 cents per kilowatt hour. That is Efficiency Vermont's cost at a time when electricity supplies were paying an average of 4 cents per

kilowatt hour of comparable electricity supplies.

Now we don't in evidence have from you, Mr. Marshall, what your costs would be to induce energy efficiency in New Brunswick. But you can tell us, I'm sure, what your average costs of providing electrical supply is in New Brunswick?

MR. MARSHALL: What the total costs of providing electrical supply is in New Brunswick?

Q. - On a kilowatt hour basis, yes.

MR. MARSHALL: The generation costs on a kilowatt hour basis are about 5 cents a kilowatt hour.

Q. - And then of course we have in evidence a number of estimates of the cost on a kilowatt hour basis for new or refurbished generating capacity, correct?

This 2.5 cents per kilowatt hour is, of course, in US funds. But would you accept that roughly translating that to Canadian funds would be about 3.6 cents per kilowatt hour, Canadian funds?

MR. MARSHALL: Roughly.

Q. - Does that sound -- within the ballpark, 3.6 cents a kilowatt hour. So if we translated this into Canadian money what this is saying that -- at least in the Vermont experience at a cost to the, in this case, the efficiency utility of 3.6 cents per kilowatt hour based on their

expenditures, they reduced their energy requirements in the province -- or in the state by 37,565 megawatt hours, correct?

MR. MARSHALL: That's what it says, yes.

Q. - Right. But we have no comparable numbers here to compare in your evidence with either your average cost of production, 5 cents a kilowatt hour, or any of the alternate -- supply alternatives going forward, is that correct?

MR. MARSHALL: That's correct. And we also don't have in this report what the costs that customers incurred in order to do the -- achieve the savings that are stated by Efficiency Vermont.

Q. - Well I think --

MR. MARSHALL: It's not the total cost of society of achieving that efficiency.

Q. - I think if you go down to the second paragraph, the second sentence. The total cost consists of Efficiency Vermont's costs of $8.5 million plus participant and third party investment and the cost that measures of $5.5 million making for a total investment of $14 million.

Now they calculate then on the bottom line, Energy Vermont's work in 2001 resulting in a net saving and electricity costs to Vermonters of $8.1 million.

Now as we can't do that here I have one further question on this, and that is, that they point out that in fact if we go back to the first paragraph where their investments of $8.5 million generated so many thousands of megawatt hours in annual savings. But they go on to say that of course those efficiency measures installed in 2001 will continue for the lifetime of the measures, long term total savings from 2001 activities is calculated to be roughly half a million megawatt hours.

So would it be fair to say that -- well let me ask you this, in your calculations on the demand side for energy efficiency using your methodology did you calculate the lifetime savings or the annual savings?

MR. MARSHALL: Lifetime.

Q. - Thank you. Now I would like to move to the evidence, appendix A -- sorry, B-1. And that's exhibit A-1, page 32 of appendix B-1. There is a table there, table 4.4.

We will get back into this a little later, but just to finish off on the energy efficiency questioning. The paragraph below that table reads, that in the low load forecast the 13 percent reduction case without CO2 costs, neither the refurbishment nor the natural gas plans or the least overall cost plans, in this case the least overall cost expansion will be with combustion turbine, DSM, small

hydro and wind.

Now can you roughly estimate this 13 percent reduction in load, the use for the sensitivity analysis, what would that represent in terms of industrial load going off the system? What would it take? How much industrial load would have to go off your system to self-generation or alternative suppliers to give you a 13 percent reduction?

MR. MARSHALL: I think the 13 percent reduction is from the end of the forecast out in 2011. So it's 13 percent of around 3,100 megawatts. So what is it? It's about 400 megawatts roughly.

And I might add that that's in addition to the load reduction that's already in the forecast and in addition to the 150 megawatts of industrial load that's already in the forecast and has exited the system.

Q. - Indeed. Thank you for clarifying that. This is out to 2011, is that what you said?

MR. MARSHALL: I think it's '10 or '11, yes.

Q. - To 2011. So in addition to what you already anticipated in the load forecast, if an additional 400 megawatts of industrial load were lost to self-generation and alternative suppliers and so on, then neither the refurbishment nor the natural gas plans become least cost but some combination of combustion turbine, DSM and wind,

is that -- am I understanding that correctly?

MR. MARSHALL: If you ignore where -- who supplies that 400 megawatts. If you assume the 400 megawatts is gone and is not supplied by anybody and the residual amount of supply left, then that's what the paragraph -- line 6 refers to.

Q. - Thank you. I would like to move on to some questions around natural gas, the natural gas option that has been modelled here. I wonder maybe we shouldn't move on.

CHAIRMAN: I think it's an excellent time to break and come back at quarter to 2:00.

(Recess - 12:15 p.m - 1:45 p.m.)

CHAIRMAN: Any preliminary matters, gentlemen? Mr. Hashey?

MR. HASHEY: Mr. Chairman, yes, the only preliminary matter would be that the transcript --

CHAIRMAN: That's number, I can't tell.

MR. HASHEY: I beg your pardon?

CHAIRMAN: The applicant sign is in front of the number. I can't tell what mike.

MR. HASHEY: Oh, I'm sorry. Six. I can hear it now. Okay. I can hear now. Okay. Start again?

CHAIRMAN: Yes, please.

MR. HASHEY: The transcript that you referenced this morning of the hearing in-camera.

CHAIRMAN: Yes.

MR. HASHEY: We have no objection to that being made public and being released as part of the record in this matter.

CHAIRMAN: All right. Anybody -- any of the other intervenors have any difficulty with that at all?

If not, then the transcript which covered the in-camera hearing which we held last Wednesday is now part of the public record and available to any -- anyone who wants it, period. Thank you, Mr. Hashey.

MR. HASHEY: Yes. On the two undertakings from last week. One I want to clarify. I have got an answer here for the one for the Province of New Brunswick. But I would like to deal with that in the morning if I might. In deciding whether that is -- should be part of the confidential documentation or not. That's one of them.

And the second one is the one that was requested, I believe, by Commissioner Sollows, which was the schedule showing the progress. I have that. But I don't have it with the bars showing the estimates. And I would prefer that we deliver it completely, and that may take two or three days. But we will certainly have it --

CHAIRMAN: Okay.

MR. HASHEY: -- hopefully, by the conclusion of this week, if that's all right.

CHAIRMAN: Good. Thank you.

MR. HASHEY: But definitely it's being worked on. And it's available and will be made available.

CHAIRMAN: Good. Thank you. Any other preliminary matters? Okay. Mr. Coon?

MR. COON: Thank you, Mr. Chairman. If we could start with exhibit A-6, CCNB-102, our favourite.

CHAIRMAN: 13.

MR. COON: Exhibit 6, CCNB-102. And once you get there --

CHAIRMAN: What is that?

MR. COON: It would be the minutes of the February 23rd 2000 meeting. This is page 2, it's numbered.

MR. DUMONT: What is the date again?

MR. COON: February the 23rd 2000.

CHAIRMAN: You want to go to?

MR. COON: A-6, CCNB-102 and the minutes of the February -- February 23rd 2000 meeting.

MR. SOLLOWS: Yes.

MR. COON: And it's page 2.

Q. - Now, Mr. Marshall, the second paragraph on page 2 here, towards the bottom, Mr. Hankinson is -- is speaking I guess. And he says, "Point Lepreau has been and is too big for NB Power's system."

Can you -- do you agree with that statement?

MR. MARSHALL: I think we have responded to it in our

interrogatory, to the extent that the -- the unit is large, it reads, "The largest contingency on the system". So it -- it requires a larger amount of spinning reserve in order to operate the system reliably. I think that that may be a reference to the size.

Also in our planning criterias we have laid out we have planned for 20 percent of the peak load or the largest unit. And the largest unit on which we rely is our portion of Lepreau. And it has been the governing criteria. So we have to carry a slightly larger planning reserve as well. I think that may be the reference to the size of the unit.

Q. - Which means there would be some advantages to having a slightly smaller unit than the Point Lepreau 635 megawatts to the system?

MR. MARSHALL: Yes, there would be a slight reduction in operating reserves and a slight reduction in installed capacity reserve.

Q. - And when you were comparing the refurbishment option with the gas option, combined cycle gas option, what was the size of the units that you -- you used, capacity size?

MR. MARSHALL: 400 megawatt gas unit.

Q. - So the 400 megawatt would be somewhat smaller, of course, than the Point Lepreau plant?

MR. MARSHALL: Yes.

Q. - Now what I want to do is in Panel A we went through and determined that the costs in 2001 dollars for the Lepreau refurbishment. And what I would like to do is to try and get these costs confirmed for the combined cycle -- 400 megawatt combined cycle gas unit that you mentioned.

So I have got a document I would like marked for identification purposes so we can refer to it.

CHAIRMAN: All right. This is headed "25 year Financial Commitment Rebuild Point Lepreau Versus New Combined Cycle Gas Generation". And it will be marked for identification number 9.

Q. - Now in the evidence, I'm sticking with A-6 here, so don't put it away. A-6, CCNB-102 for the meeting of December the 18th 2001. In the Board presentation, Point Lepreau refurbishment.

MR. SOLLOWS: What date?

MR. COON: December the 18th 2001. And a little ways into that there is the presentation on Point Lepreau refurbishment which is numbered. And on page 7 of that, part 2 business case assumption, non refurbishment. That's page 7 of that presentation.

Minutes, page 7.

MR. MARSHALL: Page 11.

MR. SOLLOWS: Of the attachment.

Q. - It actually -- it's actually -- yes. So it's on page 7 is what I want you to refer to.

Now in the gas unit information here, just running down my table in ident. number 9, the first item in 2001 dollars is capital costs. Now in -- in this -- in these minutes it refers to as-built costs for a gas unit of $435.7 million. Would that be the capital cost in 2001 dollars for the gas unit you are using for comparison purposes?

MR. MARSHALL: It would be an as-built cost in 2006.

Q. - Could we have a cost in 2001 dollars?

MR. MARSHALL: You would have to deescalate that at 1.8 percent for five years.

CHAIRMAN: Are you expecting them to deescalate it, Mr. Coon?

MR. COON: Yes, for comparison purposes we need it in 2001 dollars.

MR. MARSHALL: The question?

Q. - And the question is what would the capital cost of the gas plant be in 2001 dollars?

MR. MARSHALL: We will have to calculate that.

Q. - Thank you. The next one is with respect to Lepreau option, the evidence was presented that over 25 years of

operation there would be ongoing capital costs of $275 million.

What would the ongoing capital costs be for a new combined cycle gas over those same 25 years in 2001 dollars?

MR. MARSHALL: I believe all of the evidence related to the costs or the evaluation of the projects that we have done have been given to you in response to CCNB-79. All of the data is in that spreadsheet.

Q. - Well, not presented in this way. And we could not do a direct comparison with the cost presented in evidence by Panel A for the refurbishment option with the combined cycle gas option.

A whole variety of operating costs going forward were presented by Mr. Pilkington in his evidence. And we are simply trying to get the comparative numbers for the combined cycle gas option so we can compare.

MR. MARSHALL: The comparative numbers to evaluate the costs of the two projects are not the subject of Panel A. They are the subject of Panel B. And they are presented in evidence in the integrated resource plan under appendix B1.

And they use a net present value calculation of the stream of costs over the life of the projects, total

projects one against the other, to do a proper economic comparison.

Q. - However in evidence Panel A presented the costs of going forward with the Point Lepreau Refurbishment proposal. And we are just trying to find the comparative costs for the combined cycle gas option, so --

MR. MARSHALL: I don't have them. The data we have is in CCNB-79 in the spreadsheets. And that is the data that was used to do the comparisons.

Q. - I understand those are numbers they used. But what I'm looking for here then is an undertaking from you to provide us in 2001 dollars with an estimate of the ongoing capital costs for 25 years operation of a new combined cycle gas plant?

MR. MORRISON: Mr. Chairman, if the evidence is already there, there is really no need for an undertaking.

CHAIRMAN: Mr. Coon, when you are talking about the ongoing capital cost, there was a chart, was there not, in the evidence, that Panel A referred to concerning that?

MR. COON: Yes. They provided it on an annual basis going forward.

CHAIRMAN: Do you happen to know what that is?

MR. COON: Yes.

CHAIRMAN: And the reason that I'm asking you to do this is

that I think the question is to provide comparable evidence to what is in exhibit number so-and-so at such-and-such a page for the combined cycle gas.

MR. COON: Correct. Well, the ongoing capital cost table was presented in Mr. Pilkington's evidence of exhibit A-1, page 7. And then we had Mr. Pilkington and Ms. McKibbon provide us with the sum of that table to give us the ongoing capital cost in total.

MR. MARSHALL: Where is that reference again?

MR. COON: It was in exhibit A-1 of Mr. Pilkington's evidence, page 7 of his evidence.

CHAIRMAN: Just so I'm clear, Mr. Coon, did you put the question to Mr. Pilkington that you are presently putting to this panel?

MR. COON: No, I did not. Because we understood the evidence that he was providing was simply on the cost of operating the Lepreau Refurbishment Project going forward.

That was how they described what evidence he was giving. And they indicated that they, during the cross examination, didn't do the natural gas numbers.

MR. MORRISON: I think we are going to end up with a situation comparing apples and oranges here, Mr. Chairman, but --

CHAIRMAN: I don't know. I haven't even got the apples

nailed down yet frankly.

MR. MARSHALL: The evidence that we have presented, we have not done in the form that Mr. Pilkington did.

The job of Panel A was to identify the costs of the nuclear project, all the operating parameters of the nuclear project. That information was handed over to our strategic planning group.

We conducted the economic evaluation. The data in table 1 on page 7 of Mr. Pilkington's evidence was added with the O&M costs and included in the data on CCNB-79 and to compare --

Q. - What I'm getting at --

CHAIRMAN: Let Mr. Marshall finish.

MR. MARSHALL: To compare, you can look on CCNB-79. And we can see the capital additions. There is zero here because they are included in with the fixed O&M costs.

So the O&M, the capital and the fixed O&M were averaged in together. But on the gas unit --

CHAIRMAN: What are you referring to now, Mr. Marshall?

MR. MARSHALL: I'm in CCNB-79 on volume A-11.

CHAIRMAN: What page?

MR. MARSHALL: If we go to page 4 of 6, and the second column, greenfield, combined cycle, gas, new unit. And you can see down, the fourth, fifth line down, capital

additions, millions of dollars, $400,000 a year, 0.4 million, the capital additions that were evaluated in the gas plant. Those are in 2006 dollars.

CHAIRMAN: Oh, I see. Capital additions .04 --

MR. MARSHALL: Yes.

CHAIRMAN: -- or .4?

MR. MARSHALL: Correct.

MR. DUMONT: Would that be the same as ongoing capital costs?

MR. MARSHALL: That is what ongoing capital costs would mean. That is, you go and you -- if you have a pump that would fail and then you replace the pump, you put it in, the pump is still capitalized for a period of time over the remaining life of the project. That is what we refer to as a capital addition.

Q. - So those are in 2006 dollars, .4 million?

MR. MARSHALL: Yes.

Q. - And we would ask for just comparative purposes that you undertake to provide us with that deescalated to 2001 dollars. So that will take care of that one.

Now looking back at the Board minutes here, there is a figure given for the O&M costs in 2001 dollars for the nonrefurbishment case for the gas unit. This is back, referring back to A-6 in the minutes of the Board.

And they use a figure of -- in 2001 dollars for $14.3 million for the gas unit. Is that the correct number, Mr. Marshall?

MR. MARSHALL: It says 14.3 in 2001 dollars. I assume it is the correct number at that point in time. But the number used in the evaluation, again I point you to CCNB-79. And --

Q. - We will get to that.

MR. MARSHALL: -- you can check the number there.

Q. - We will get to that. Okay.

And then for fuel costs, now in the Lepreau example the panel said well, we didn't include fuel costs directly because that is another part of NB Power in terms of going forward with Point Lepreau.

But it was roughly 10 to 15 percent of the operating and maintenance costs, according to the panel, which is where my numbers 250' to 375 million come from here, just to provide a point of reference.

What I'm looking for here is what would be the fuel costs in 2001 dollars for operating the gas option for 25 years?

MR. MARSHALL: The -- well, first of all you have to compare apples with apples. So you would need more fuel than there is to operate the gas plant.

You would have to operate the gas plant plus you would have to replace all the energy above that that Point Lepreau generates. And that is --

Q. - That is not what I'm asking for.

MR. MARSHALL: -- done in appendix B1.

Q. - What I'm asking for is the cost of fuel to operate the gas plant, the 400-megawatt gas plant?

MR. MARSHALL: If you want to calculate it to be consistent with the number on that page, you would take the 400 megawatts multiplied by the 73 percent capacity factor, multiplied by the heat rate of 6,500 BTU's per kilowatt hour multiplied by the fuel price in dollars per million BTU.

I don't have the fuel price in 2001 dollars. We did all our evaluations from 2006 forward. So you would have to take the fuel prices given in the evidence in 2006, deescalate them to 2001 to do that calculation. It is really not meaningful for the evaluations that we have done.

Q. - Well, it doesn't matter. For my purposes here I would ask you to undertake to do that calculation and deescalate it to 2001 dollars please?

MS. MACFARLANE: Mr. Chairman, I would like to interrupt here. I believe it is very flawed methodology to add up

something in 2001 dollars over 25 plus years. I objected to it when I read it in the transcript that you did with Panel A. I object to it now.

A dollar today is not the same as a dollar 10 years or 20 years or 25 years from today. Because money has a time value to it. It earns interest such that a dollar today can be set aside and will be equivalent to let's say $10 in 10 years.

You cannot add up 2001 dollars and expect to come up with anything that makes any logical sense. If you continue down this path you will simply prove that IFM and decommissioning costs, which will in 2001 dollars appear to be more for Point Lepreau than it is for the natural gas case, will in fact make the PLGS totals higher than for natural gas.

If you did this on a net present value basis, which was the methodology agreed to in the generic hearings, and is the only sound methodology for an undertaking like this, and was done in appendix B2, you will see that those end effect costs, those end costs for IFM and decommissioning in PLGS, because there is another 30 years for investment, are in fact lower than in the case of natural gas.

It is irrelevant to be adding up for O&M, for capital,

for fuel, for any of these costs, dollars today with dollars tomorrow with dollars in 2032.

CHAIRMAN: Ms. MacFarlane, that is enough. That is the kind of thing that your counsel will quite ably do for you on the conclusion of this hearing.

If Mr. Coon's logic is flawed, I'm sure that Mr. Hashey will point it out to us. It is not for the particular witnesses to argue the points time and again as we go through the cross-examination.

You have made your point on this one. You will have an opportunity to talk to your counsel about redirect. And I'm sure either one of them will do an admiral job of bringing it to the Board's attention at the conclusion of the hearing.

So Mr. Coon, go ahead.

Q. - Well, that is it on this. If I have the three undertakings to provide those deescalated costs for capital costs, ongoing capital costs and fuel purchases --

MR. MORRISON: We haven't given any undertaking in that regard --

Q. - Well, that is my request.

MR. MORRISON: Mr. Coon is quite capable of doing the calculation.

Q. - You think so?

CHAIRMAN: Frankly, Mr. Coon, I know that sitting next to him is a gentleman who could certainly could do it, but neither one of them are witnesses. I think that it's appropriate that he ask this Panel to devalue those into 2001 dollars. Now if they want to do it in an undertaking, that's fine. If they want to do it here and now while we wait, that's fine as well.

MR. MORRISON: Well I guess we will give the undertaking, Mr. Chairman.

CHAIRMAN: Okay. Thank you.

Q. - Thank you. Well let's take a look now then at the methodology that you used. Now let's just -- if we can go to the pre-filed evidence in exhibit A-1 to appendix B-2. And there is a spreadsheet there called base gas which Mr. Marshall had us look at earlier to make a small adjustment just in the summary. It didn't change the substance of this. I have a series of questions to try and understand exactly how this has worked on the gas option.

Now the capital cost line -- or column, I should say, for the combined gas power plant has a figure in 2006, 2007 of $435 million basically. Now that figure I assume relates to the capital cost number that we had spoke of just earlier that was in the Board minutes.

MR. MARSHALL: That's correct.

Q. - That's the number there. And then here you have combined O&M and capital costs going forward over 25 years in the next column. Now maybe you can just explain to me a little bit. When you add these up you don't actually get any of the totals below here, so presumably they are not to be added, am I correct?

MR. MARSHALL: That's correct. The totals below are net present value calculations of the cash flow.

Q. - And those are provided in both 2001 and 2006 dollars?

MR. MARSHALL: That's correct.

Q. - Right. Okay. But we can add them up as we go across that row for the appropriate net present value figures, correct?

MR. MARSHALL: Yes.

Q. - Yes. Okay. Now -- so we have O&M plus ongoing capital costs together. Then we have fuel/CO2 costs. Now am I to understand these simply aren't -- this is something more than simply the fuel costs for fuelling the 400 megawatt gas unit?

MR. MARSHALL: No. And in that particular case, the base case, that is the cost of the fuel for the gas unit.

In the next case, where the sensitivity case where the CO2 is included, then there is a CO2 cost component as well as fuel in that column.

Q. - Okay. So for this spreadsheet, this case, this is simply the cost of fuelling the 400 megawatt power gas plant?

MR. MARSHALL: Operating at the capacity factor that it operates at, yes.

Q. - Thank you. Now the next column -- well not in the next column, but if you skip three columns over, you have something called Replacement Energy. Can you explain what this is? I assume this is not -- when we think about replacement energy for Point Lepreau as when it's out, we have to buy power. Is that what this refers to?

MR. MARSHALL: No.

Q. - No.

MR. MARSHALL: The -- in order to compare total costs you have to have an equivalent value of product. So in order to get the same number of kilowatt hours over the life, the gas unit is only 400 megawatts and it cannot produce as much energy as Point Lepreau produces at 630 megawatts. So the differential amount of energy that has to be generated from the rest of the power system in order to replace the energy generated on the left-hand analysis with Lepreau, has to be evaluated and added in so that we are comparing apples with apples to get an equivalent comparison. That's what that replacement energy cost is. Maybe it more appropriately should be called additional

energy requirement to be equivalent to Lepreau.

Q. - Okay. So as I understand what you are just telling me, while we agreed that in 2006 when Lepreau goes down there is going to be a short-fall of some 300 megawatts in capacity, in addition to the 400 megawatts that the gas plant can produce in associated energy, you are adding in additional energy that is not required to meet the short-fall to bring it up to the overall output of the Point Lepreau plant, is that what you are doing here?

MR. MARSHALL: It's -- no, that's not quite correct.

Q. - Okay.

MR. MARSHALL: It's not energy that's not required. It is energy that is required and it's energy that's produced far cheaper with Lepreau than it is with the gas plant. So from a fuelling basis you have to include the equivalent amount of energy in each calculation to get a comparison, a proper comparison between the two.

Q. - But if I'm only needing 300 megawatts 2006 and maybe four 2012, and I have got a 400 megawatt power plant, why would you burden that plant with additional costs in determining its cost effectiveness?

MR. MARSHALL: We are not burdening the plant at any way. What we are trying to do is to compare the plant to the Point Lepreau refurbishment. Point Lepreau, once we spend

the capital which we have included here all the capital and all the fixed costs, can produce energy at a very low fuel cost. It's capable of producing energy up to 635 megawatts. The value of that energy is worth a lot of money. So we need to capture the value of that energy against an equivalent other source of energy in the case with the gas plant. That's why you need that additional energy column.

Q. - You are referring to the value of that additional energy in terms of export sales, is that --

MR. MARSHALL: No, sir. This would be strictly for in-province production.

Q. - Then if you wanted to evaluate these two options with equivalent output, why wouldn't you have evaluated a gas plant option of a similar magnitude or size, capacity, as the refurbishment option?

MR. MARSHALL: Well I think we have responded to that in an interrogatory as well that you asked earlier.

Q. - I don't understand it.

MR. MARSHALL: The 400 megawatt gas unit is actually more economic and a closer comparison to Lepreau in cost than a 600 megawatt unit. A 600 megawatt gas unit would cost more, would generate more energy from gas. This particular evaluation takes advantage of the low cost

energy from a Coleson Cove conversion and available on the rest of the system, so that the make-up energy is at a more advantageous cost. So this is a lower cost way to do it than with a 600 megawatt gas plant.

Q. - So what you are telling me is that you have got a total fuelling cost here in 2001 dollars of 980 million for the gas plant and then you are purchasing 819 million in 2001 dollars to bring it up to the overall output of Point Lepreau, is that correct?

MR. MARSHALL: That's correct.

Q. - So you are generating -- in a sense you are -- well what are you going to do with all this additional energy? I don't quite grasp it here, maybe I'm a little slow. But if all you need is 400 -- less than 400 megawatts in 2006 but you are making the plant buy almost as much again value-wise as you are paying for fuel to run the gas plant, what do you do with all that extra energy you don't need?

MR. MARSHALL: There is no extra energy here. The energy is identical on both sides of the equation that we are comparing.

Q. - If you refurbish Point Lepreau you identified a gap of 300 megawatts or so in 2006, with Lepreau refurbishment would that not then put you in a surplus position

according to Integrated Resource analysis?

MR. MARSHALL: Again you are -- there is flawed thinking here that the amount of surplus capacity or the amount of capacity that is required to meet the planning criteria is the only useful capacity. Any capacity in the system that's capable of producing energy at a low fuel price will be dispatched ahead of any other capacity and utilized to its full extent. The most expensive capacity will be saved until the last and dispatched last.

Point Lepreau being 635 megawatts and having a fuel cost of around 2 to $3 a megawatt hour will be dispatched first. Lepreau and Hydro are dispatched first and utilized to their full extent. The remaining load is then met with the rest of the system. In order to compare these two projects, because a gas plant could only run at 400 megawatts, you need to make up the additional energy that would have been dispatched by the nuclear that now is not there with only 400 megawatts of gas. It has to be generated somewhere on the system, and it's being generated by higher costs to other sources.

We have to accommodate those costs so that we are comparing an equivalent amount of energy in each case in order to do a valid comparison.

Q. - Now in the case of a combined cycle gas power plant here

we will back up because we missed columns early on here in terms -- and that have costs implications in the comparison. Now let me use the dates here, first of all in this comparison you are not only comparing the period from 2006 to 2032, but you are actually comparing from 2002 forward. Is that my understanding of how this is laid out?

MR. MARSHALL: That is correct.

Q. - So you are comparing four years pre-refurbishment or pre whatever, pre Lepreau shutting down?

MR. MARSHALL: Only for the Lepreau costs. Because they are the only costs that change in that prior period.

Q. - Right. But some of those costs in that period and afterwards you have assigned to the combined cycle gas power option. Is that correct?

MR. MARSHALL: We have a different stream of costs for Point Lepreau under the scenario where it is refurbished and goes forward than we do under the scenario where it would be shut down and not go forward.

So those are what are modeled in the spreadsheet, the two different steams of costs for Lepreau.

Q. - So in comparing -- to understand this correctly then, in comparing for example the ongoing O&M and capital costs -- sorry, in comparing the combined cycle gas option you have

added 449 -- $450 million 2001 to the gas option from ongoing O&M and capital costs from Point Lepreau?

MR. MARSHALL: That is the total cost of Point Lepreau going forward from 2002 to 2005. In the Point Lepreau case it also includes all those costs. What gets compared is only the differential cost between the two.

Q. - Correct. But in making this comparison you are taking costs incurred for Point Lepreau and attaching them to the gas option as well as in the Lepreau option?

MR. MARSHALL: We are doing that to capture the differential costs between the two projects. So we model the two projects on a level playing field to capture all the costs associated with one, all the costs associated with -- with the other so we can do a fair comparison.

Q. - So let's take for example, just to make sure I fully understand this methodology. Under Point Lepreau we have column called decommissioning and I guess irradiated fuel management or something cost?

MR. MARSHALL: Yes.

Q. - And then 2001 dollars there in total for the 25 years would be 127 million, roughly?

MR. MARSHALL: That is correct.

Q. - Okay. So that is what you are assigning to the Point Lepreau options. And then we go to the gas option and you

have a similar column, decommissioning and IFM costs and here you have assigned in 2001 dollars 170 million, rather than 127 million. So actually more costs for going to the natural gas option for decommissioning and radioactive waste management.

MR. MARSHALL: That is correct. That is correct.

Q. - And can you explain the difference why you would assign more costs for radioactive waste management and decommissioning to switching to gas instead of refurbishing Point Lepreau?

MR. MARSHALL: Well I think it is the explanation that Ms. MacFarlane just gave about the time value of money. In the gas case, if Point Lepreau is retired in 2006 and doesn't go forward, the clock starts ticking on the decommissioning time line and the expense of when decommissioning occurs, and it would occur sooner in time. And by occurring sooner in time, the amount of money set aside to pay for it on a net present value basis wouldn't earn as much interest. So you need more money.

In the other case, the cost of the decommissioning are actually deferred. The clock starts ticking in 2032 when the project actually then retires and you then go forward and incur the expenses in order to cover off the decommissioning at a later date in time.

On a present value basis you need less money today to pay for an equivalent amount of decommissioning cost at a later date than you do at an earlier date. That is why the costs differ.

Q. - Isn't it the case that the dismantling costs which are the bulk of the decommissioning costs, as we learned in Panel A's cross-examination, the dismantling of Point Lepreau could be pushed off 40, 50, 60 years whatever option you choose. Whether it is refurbishing Point Lepreau or gas, there is no requirement to have the reactor dismantled in 30 or some odd years after it is put to sleep?

MR. MARSHALL: That is a panel A question. I wouldn't know.

MS. MACFARLANE: In the evidence, in appendix A-5 and A-6, it says the decommissioning plan and the used fuel management plan as filed by the CNSC. And they do set out a plan to take that site to greenfield over a period of years. And I believe that is -- as I say, something that has been accepted by the CNSC.

Q. - Yes. We had thorough examination of that. And my question was simply, is there anything magic about the years they picked for dismantling? If they were pushed forward into the future presumably it would change the differential between -- in this column for decommissioning

cost between gas and Lepreau refurbishment. Isn't that true?

MS. MACFARLANE: I believe it is a requirement of the CNSC that the plan be filed and that the plan be filed with an intention to take the plant to a greenfield site within a certain period of years.

We can certainly though get that information from Panel A and bring it back to you.

Q. - If the dismantling of Point Lepreau were pushed off into the future beyond what the plan states, would that reduce the differential between -- for this column, between the natural gas and Lepreau options?

MS. MACFARLANE: Yes, it would. But as I say, I believe it is a requirement of the licence with CNSC. And we will undertake to find that out for you.

Q. - Another question. In this comparison we are assuming that, for this purpose, the Point Lepreau refurbishment operates for 25 years. Is that correct?

MR. MARSHALL: Yes. I think that is what Panel A was saying.

Q. - And for the combined cycle gas power unit you are assuming also it operates for 25 years?

MR. MARSHALL: That is correct.

Q. - Now if it actually operated for 30 or 35 years, how would

you make the comparison between this and the Point Lepreau option?

MR. MARSHALL: You would have to do an end effects calculation on the overlapping years. And I believe we have already responded to that in the interrogatories that you requested. We did it with a shorter life and a longer life on the projects and have given you levelized life cycle cost comparisons for those.

Q. - But in this spreadsheet, if that were done, would it be the case that you would have to have a fuel purchase or power purchases in the Point Lepreau option to make up the difference between its 25 years of operation and 30 or 35 years of operations for the gas plant?

MR. MARSHALL: As I said, you would need to do some type of end effects calculation to get the two on an equivalent basis.

Q. - But is that the kind of thing you would have to do?

MR. MARSHALL: That would be one way to try to do it, yes.

Q. - Thank you. To your knowledge, Mr. Marshall, combined cycle natural gas plants, they have been around for a number of years in operation?

MR. MARSHALL: For about 20 years, yes.

Q. - So there has been plenty of experience with combined cycle natural gas power generation?

MR. MARSHALL: Yes.

Q. - There is a reasonable understanding of the risks of operating a combined cycle natural gas plant, financial risk?

MR. MARSHALL: I think on a financial risk basis the risk is not so much in operating the plant, the risk is in the price of the fuel that goes into the plant and the volatility of natural gas prices.

Q. - So you would therefore characterize -- aside from the fuelling costs, combined cycle natural gas is a low-risk way of generating power?

MR. MARSHALL: You can't ignore fuel costs when you are assigning risk. The risk is what is the cost of the electricity that you want to produce as an end product. And you have to consider all the risks inherent in that.

Q. - Let's agree for now that the cost of the gas is high risk. The remaining costs associated with operating a natural gas plant, would you characterize as low risk in that case?

MR. MARSHALL: Certainly lower than the fuel price risk, yes.

MS. MACFARLANE: Mr. Coon, I believe there is also a financial risk associated with the supply contracts for the gas, which are take or pay contracts over the long

term.

So beyond just the volatility of the price itself there is also the financial risk associated with making commitments into the future some 25 years for supply of gas.

Q. - Thank you for that. And that reminds me, with respect to fuelling costs for the Point Lepreau option, it is our understanding from the evidence that was filed that there are no contracts at this point of course going forward to cover fuelling costs for a refurbished Point Lepreau?

MR. MARSHALL: That is a Panel A question again.

Q. - Let me ask you this. Where did you obtain your fuel costs for the comparative analysis here between the gas option and the Lepreau refurbishment option for Lepreau's fuel?

MR. MARSHALL: From Panel A.

Q. - Now when we asked Panel A what the fuelling costs were for Point Lepreau, they said they couldn't tell us specifically because that is not something they were charged with dealing with?

MR. MARSHALL: No.

MR. MORRISON: No, Mr. Chairman. Could Mr. Coon point out where in the transcript he comes up with that statement?

Q. - I can. I can look for it. But I can also add to that

that what Panel A said was, when I pushed them on it, they said well, roughly 10 to 15 percent of the O&M costs would be what your fuel costs would be.

So is it 10 to 15 percent of the O&M costs for Lepreau that you use for your fuel costs in this comparison for Lepreau?

MR. MARSHALL: No. We -- the fuel costs for Lepreau come from a detailed evaluation of fuel provided by the Lepreau people, the fuel people.

And I believe Mr. Easson went in and did an audit of that, checked the component pieces of that fuel cost as laid down in the evidence and passed it and utilized by us.

I believe there are three components of the nuclear fuel cost, the actual uranium cost, the fabrication cost and -- I don't know what the other one is, transportation or something.

Anyway, these three component pieces all add up to get to the cost. We take the end fuel cost and put it into our models to evaluate the economics. The component pieces of the fuel cost are subject of the Lepreau people in Panel A.

Q. - Right. So just to be clear then, as Panel A said, they did it as a percentage of O&M, 10 to 15 percent. That

must be what you did in coming up with the numbers here?

MR. MARSHALL: I don't know what Panel A said. They provided a fuel cost that -- I guess it is not itemized separately in this spreadsheet. But the fuel cost for the nuclear was provided in the -- where are we here?

Actually on the spreadsheet, note 5, which says that the nuclear fuel costs come from the NB Power fuel price forecast, September 28th 2001, I think that fuel price forecast is prepared by the fuels department on the nuclear side of that. They would get that information from Point Lepreau in terms of coordinating that together.

Q. - Okay. So the fuel prices in here then were based on the forecasts that were done in-house by NB Power?

MR. MARSHALL: Yes.

Q. - Thank you. Now if we could turn to exhibit A-13 which are supplementary interrogatories, and go to CCNB-18. That would be on page 25.

MR. DUMONT: CCNB-18?

CHAIRMAN: Supplemental 18. That is at A-13.

MR. MARSHALL: Okay. I have it.

Q. - Now here we have a comparison on page 25 with Point Lepreau's refurbishment including replacement costs, replacement powers costs I guess during refurbishment with --

CHAIRMAN: Hang on.

MR. COON: Sorry.

MR. DUMONT: Would you repeat --

MR. COON: It is exhibit A-13, CCNB supplementary 18.

CHAIRMAN: What page?

MR. COON: 25 to 27.

Q. - Now here you have provided us with a couple of tables to compare the costs of refurbishing Lepreau including replacement power costs during replacement with on page 27 the combined cycle gas 400-megawatt unit.

And we have a series of questions on this. Beginning -- if we look at capital costs on page -- first table on page 25, in that column beginning 2006 we have a figure $823.6 million.

Now that is your capital cost figure plus replacement power?

MR. MARSHALL: There is a note at the bottom that says, includes 66 million in replacement energy.

Q. - Okay. Now just to understand where this number came from, Panel A gave the figure in 2006 dollars for the refurbishment at $845 million capital costs plus $344 million replacement fuel costs.

Can you explain why this number only appears to be 823.6 million?

MR. MARSHALL: I would have to check on that.

Q. - And that is going to be checked on?

MR. MARSHALL: Yes. And just reading the question, this was done as a levelized life cycle costs? Most of the debt is in CCNB-79?

Q. - Yes.

MR. MARSHALL: But I can cross-check on that number.

Q. - Thank you. Appreciate that.

Now in this comparison, if we look at the total life cycle costs in 2006 dollars, Lepreau with replacement power is, well, 2.5, $2.6 million.

If we turn to the gas option, the total life cycle costs in 2006 dollars for the gas option is about $2 million, making it roughly half a million dollars -- sorry, these are billions, aren't they? $2.5 billion versus $2 billion.

So about half a billion dollars less expensive for the gas option in this comparison?

MR. MARSHALL: Yes. And I point out that these are levelized life cycle costs of the power of those specific projects. That is what you asked for.

It does not take into account the differential energy costs that would have to be provided on the system to get the two projects so that you are comparing apples with

apples.

This is a valid comparison to calculate an energy cost rate from the two, but not a valid comparison to compare net present values.

Q. - Okay. So this just is comparing the costs of the 400-megawatt gas plant with the cost of refurbishing --

MR. MARSHALL: With a 600-megawatt nuclear plant.

Q. - That is correct. Yes. 400-megawatt gas plant with a 600' and some odd --

MR. MARSHALL: Right. Without any -- without any balancing of the energy differences between the two.

Q. - Just a quick little question occurred to me. How much of Lepreau's capacity is required to provide power for Lepreau? 635 megawatts, is it? What capacity is required to actually run the station?

MR. MARSHALL: Are you talking about station service?

Q. - Yes.

MR. MARSHALL: Point Lepreau is really about 680 megawatt, generates 680 megawatts of electricity, uses about 45 megawatts and then produces 635 megawatts of net power into the grid.

Q. - Net? I just wanted to clarify. Thank you.

MR. COON: Now Mr. Secord has a couple of questions on this.

MR. SECORD: I'm continuing with the response to CCNB

supplemental 18, and my questions have primarily with clarifying the methodology which is used. The -- as I understand it, this is essentially the annual input data which has been used to calculate the levelized cost figures which appear in table 3.5 of appendix B-1 of the original evidence in exhibit A-1, is that correct?

MR. MARSHALL: What is -- supplemental 18 is in response to a question to provide background data to calculate levelized life cycle costs.

MR. SECORD: These numbers were essentially the input which was used to calculate those levelized cost figures, is that correct?

MR. MARSHALL: The input number to calculate the levelized cost features are in CCNB-79. That's the actual spreadsheet with all the actual data.

MR. SECORD: Right. Now the response to supplemental 18, my understanding is that provides the same information as the response to CCNB interrogatory 79, but expressed in a different way, is that correct?

MR. MARSHALL: I guess you could say that, yes.

MR. SECORD: There is nothing in interrogatory 79 that is not in your response to supplemental 18 with respect to the cases in supplemental 18, is that correct?

MR. MARSHALL: Rephrase that. I don't want to get tricked

up on that.

MR. SECORD: Well it's not meant to be a tricky question. In supplemental 18 you have five cases which I believe are also in response to interrogatory 79. My understanding is in the response to supplemental 18 it's the same information as in interrogatory 79, it's just that it's drawn out and expressed on an annual basis? If I start recalculating with some different assumptions with responses with supplemental 18, I don't want to leave anything out, is what I'm getting at, aside from any changed assumptions.

MR. MARSHALL: I think that's correct, with the exception that I'm not sure that item A is in CCNB-79. All of the ones in response to 18 are not necessarily in CCNB-79 which was the base.

MR. SECORD: Correct.

MR. MARSHALL: These were responded to as a request after you had CCNB-79.

MR. SECORD: Thank you. Now I have some questions about the first -- information page 25. This is the case. Point Lepreau refurbishment including replacement costs during refurbishment, and there is a double starred footnote at the bottom which says, replacement energy costs of 66 million is included in the capital costs. So am I correct

in assuming that in the capital cost of 823.6 million you have included 66 million for replacement energy?

MR. MARSHALL: The capital cost has an adjustment of 66 million. Again, I said to Mr. Coon, subject to check, we will get what it is. I believe what it is is the cost of a capacity contract to get through the winter plus some energy that you wold need in order to get through the winter to support that contact. It is not the full total equivalent energy replacement capacity energy. It is a capacity contract adder that was used in our model in order to get through the winter period to make up the 300 megawatt short-fall in 2006/7.

MR. SECORD: So am I correct in interpreting that $66 million figure if I said the following, that if you did not refurbish Lepreau, you could supply the equivalent service to the New Brunswick system at a cost of 66 million a year in the year 2006?

MR. MARSHALL: I said you could -- we could assume that we could contract for 300 megawatts of capacity to make up the capacity short-fall and contract for a block of energy, a minimal block of energy that might fit with the existing resources to get through the winter. That's what it is and it was included in the modelling. It's not necessarily that you could do that through that one

winter. If you did that on and on every year it doesn't accommodate the rest of the cost of the system and it may not be the preferred longterm option at all.

So I wouldn't read anything into it other than it is a cost to get through that one winter.

MR. SECORD: So this quite a different number then from the previous replacement energy we have seen of $299 million per year for the replacement energy for the Lepreau unit?

MR. MARSHALL: Could you give me a reference to the 299?

MR. SECORD: Yes. If we went back to the spreadsheet, fold-out spreadsheet which we were previously discussing, which is appendix B-2, and appendix B-2, the first fold-out base gas case, if we look under Point Lepreau refurbishment under the subsection replacement energy (note 8), and go down to the years 2006/7, 2007/8, we see replacement energy costs of 204 million in one year and then 95 in another for a total of 299.

MR. MARSHALL: Yes.

MR. SECORD: So that was the figure I was referring to. And I just wanted to clarify the treatment of replacement energy in the levelized cost approach versus the spreadsheet approach which mimics the PROVIEW approach. Perhaps it would clarify the situation if you could explain or if it's possible to explain the difference

between the $66 million figure and the $299 million figure?

MR. MARSHALL: The $66 million figure is a -- again subject to check -- it's a capacity purchase contract for five months to have the 300 megawatts through the winter, plus a block of energy, I forget the exact amount of energy. That's all that it is.

The $204 million is the total energy of Lepreau at what its energy costs would be dispatching the system with Lepreau and then not having Lepreau and having to replace all of that energy with higher cost sources and reduced export profits all coming into that to get to that number.

So they are two very different calculations.

MR. SECORD: Okay. I have another question with respect to page 25. The figure for capital cost, 823.6, is entered for the year 2006. And then for 2006 following they show fuel costs and so on. It appears that in this levelized cost analysis you are assuming that the plant is operating at near full capacity in 2006, is that correct?

MR. MARSHALL: Yes. This is a levelized life cycle cost of an isolated option without any consideration of the system that it is integrated into. It treats the gas plant the same way. We are not trying to balance the total costs of the system with the option here. We are simply laying out

what the data is to calculate levelized life cycle costs, and the data that then goes into the system integration, they calculate the real net present value economics.

Any of these comparisons in response to CCNB supplemental 18 are simply screening curve calculations of comparative costs. They are not integrated into the system. They are only indicative of what the economics my be. They are not true calculations of the value of the economic difference between options.

MR. SECORD: This methodology is what has given you the cents per kilowatt hour figure in the evidence, 5 correct.

MR. MARSHALL: In table 3.5. We believe it is in appendix B-1, that's correct.

MR. SECORD: Could you explain why in the levelized cost analysis you did not calculate net present value in 2001 dollars, why you chose to do it in 2006 dollars? That is, the decision moment is now, as I understand it, when you - at a decision moment you typically discount future cost and benefits to the present moment as opposed to some moment in the future.

MR. MARSHALL: That's why the PROVIEW calculations were all discounted to 2001 dollars and presented in the evidence.

The -- usually power plant options when you are looking at individual power plant options, you cost them in the

year

in which they are going to occur. So that's why we chose 2006.

You also cost them so they are all in an equivalent year, so you are comparing apples with apples.

So we did all of the costing of the options in 2006 to give an indicative price of what the cost of the power would be because that's when you need it.

Now in terms of doing net present value to the decision point, we did net present value to 2001.

MR. SECORD: Am I correct in inferring that if you calculated your net present value figures in 2006 dollars, you might get different answers -- excuse me -- if you did it in 2001 dollars, am I correct in assuming that that would change your cents per kilowatt hour figures?

MR. MARSHALL: It may change the cents per kilowatt hour figures. It would not change the relative ranking of the options.

MR. SECORD: Would it not change the relative ranking of the options if the time distribution of costs is different -- are different among the options?

MR. MARSHALL: The -- given that you are pricing all the options in 2006 and you have the time differentiation difference from 2006 on, if you then moved all the options to 2001, the time differentiation would move with them and

you would get the same relative ranking of the net present value calculation?

MR. SECORD: Would not extending the discount period back to 2001 result in a relatively more discounting for the natural gas fuel costs than it would for the refurbishment fuel costs, since they are higher values which would be subject to more -- relatively more discounting?

MR. MARSHALL: No. The relative magnitude would be the same. In other words, by that I want to make it clear. If the ratio -- if the net present value ratio of the costs in 2006 was 1 to 1.2, and you take the two net present values in 2006 and you continue to discount them back to 2001, the number in 2001 will be smaller for both of them. The ratio will still be 1.2, 1 to 1.2. The ratio and the relative effect of them will not change.

MR. SECORD: On page 25 do the costs for the refurbishment project include AECL payments?

MR. MARSHALL: Which AECL payments are you referring to?

MR. SECORD: Payments from AECL under the performance agreement.

MR. MARSHALL: I don't think so. And I think the reason why is that -- and again subject to check, all the calculations in CCNB 79 that are done for the levelized life cycle costs are all done at a nominal capacity factor

of 80 percent. 80 percent is the break even point at which payments either paid one way or the other, so there are no payments in these calculations.

MR. SECORD: On page 27 you provide the information on the -- the equivalent information on the greenfield combined cycle gas new unit project. I think I know the answer to this question but I just want to get it confirmed, that on this page there are no numbers associated with the refurbishment project. Is that correct?

MR. MARSHALL: That's correct.

MR. SECORD: I just have -- well there is one other question I have. Have you carried out a sensitivity analysis on the levelized costs to using a private sector discount rate?

MR. MARSHALL: We didn't do it for the screening curves or the levelized life cycle cost. We have done -- we have done sensitivities in the full integration analysis. And I believe they are in the evidence, both in my evidence and in appendix B-1 at --

MR. SECORD: I was just referring to the levelized cost analysis. So your answer is no?

MR. MARSHALL: We did not do it for the levelized cost analysis. We have done it in table 4-4, page 32 of appendix B-1. We used 9.33 percent discount rate.

Q. - Just a couple more questions on these tables. Now in making these comparisons there is no column to account for the replacement power costs over the 25 year period that Point Lepreau might operate while it's down, either for planned maintenance outages or unplanned outages?

MR. MARSHALL: Are you referring to supplemental 18 again?

Q. - Yes.

MR. MARSHALL: That's correct. I said that before. These are isolated calculations of power cost of the alternatives given the data you requested to have them evaluated in. They are not intended to be a comparison of the integration with the system. It's a what is the isolated building block that you have to then put into the model to integrate together with the system. The integrated results are only provided in appendix B-1.

Q. - Now in these tables you have calculated not only the total levelized costs for these options but also the cost in 2006 dollars per kilowatt of capacity. Is that what that bottom row represents?

MR. MARSHALL: That's the way I read it too, yes.

Q. - Yes. So would it be fair then to say you could compare directly between the refurbishment option here on a per kilowatt of capacity installed basis at four million roughly with the -- page 27 similar cost per kilowatt for

the gas option about similarly four million per kilowatt installed?

MR. MARSHALL: Ignoring the integration with the existing system, yes, you can make that comparison.

Q. - That would account for the difference between the capacities in the two plants. Thank you.

MR. SECORD: I just have one last question on -- to connect this supplemental information with the cents per kilowatt hour figure. If we look for example on page 25 we have net present value for the refurbishment case of two billion 565 million in 2006 dollars, which I take to be all of the total costs discounted at a discount rate of 7.15 percent. Correct?

MR. MARSHALL: That's correct.

MR. SECORD: Now to get a sense per kilowatt hour figure -- I just need confirmation here -- I assume we multiply the capacity of the nuclear unit 635 by the 80 percent capacity factor and multiply it by the number of hours in the day, times number of days in the year, times number of years you operate. Get that number and divide it into the two billion 565 million and that will tell you your levelized cents per kilowatt hour cost. Is that correct?

Excuse me. I'm going to -- before you spend too much time thinking about that, I'm -- it's incorrect. I

just -- let me rephrase that. You take the NPV figure, the 2565 and from that you calculate a levelized annual cost. Is that correct?

MR. MARSHALL: That's correct.

MR. SECORD: And then you take the levelized annual cost figure and divide that by --

MR. MARSHALL: The annual energy.

MR. SECORD: Annual energy output which would be the 635 in megawatts multiplied by the 24 times 365, times the .8?

MR. MARSHALL: Yes.

MR. SECORD: And that should give you the numbers in -- give you the numbers in table 3.5. But I just needed confirmation your methodology there.

Q. - It is back to this issue of accounting for replacement power costs during the operating life of a refurbished Point Lepreau.

If we go back to the spreadsheet in appendix A-1 -- sorry, exhibit A-1, the base case gas, the foldout one which is I guess appendix B-2.

Now Panel A said that there was somewhat over $400 million worth of replacement power costs associated with the operation of Point Lepreau over its 19 years of operating life to date. I think in one of the interrogatories, Mr. Marshall, you calculated that kind of

outage forward for us. And again, it was somewhere over $400 million of replacement power would be required if outages in the refurbished Lepreau were similar to what happened with Point Lepreau in its first 19 years.

In this spreadsheet once again replacement power costs while it's operating are not accounted for. Is that correct?

MR. MARSHALL: That's correct. If they were accounted for in the Lepreau case that would add additional energy. That additional energy would also have to be accounted for in the gas case. And so you would be adding the same -- same amount of costs to each side of the equation. And you would end up with the same result. So that additional cost is irrelevant in this analysis.

Q. - You would add the same amount of replacement power costs associated with outages from Point Lepreau to the gas option?

MR. MARSHALL: The way this methodology works that's what you would do. So rather than do that we said -- we calculated what is the expected output of Lepreau and then what is the dispatch output of the gas unit. And then we only made up the differential piece on the gas side to get them equivalent.

Q. - Yes. Thank you. So that's interesting. So this

methodology here, if you included replacement power costs incurred for Lepreau outages during operations, this methodology would force you to include those numbers on the gas side?

MR. MARSHALL: That's correct. That's -- the way this spreadsheet is set up that's what it would do.

MR. COON: Thank you.

CHAIRMAN: Mr. Coon, is this a good spot to take a 15 minute recess?

MR. COON: Yes.

(Short recess)

CHAIRMAN: Any preliminary matters? If not, Mr. Coon, go ahead.

Q. - I was just wondering to start off whether the undertaking to provide the export figures in the -- for the integrated resource analysis has been completed? If it was available yet?

MR. MORRISON: No, Mr. Chairman.

Q. - Those are the in -- in country export figures that we talked about. No?

MR. MORRISON: They are not ready.

Q. - Okay. Thank you. I would like to turn to -- in the evidence A-1, to appendix B-1, page 31. Now as I understand this table 4-3, this is in net present value

costs in millions of dollars, in 2001 dollars. And this compares your base case comparison between the natural gas plant and refurbishment with a variety of sensitivity analyses. Is that correct?

MR. MARSHALL: Yes.

Q. - So using -- and these numbers come from these complicated worksheets?

MR. MARSHALL: No.

Q. - No, these come from somewhere else?

MR. MARSHALL: These numbers come from the detailed integration evaluations done with the PROVIEW model, where we model the existing system in detail, and integrate in the DSM options and supply options to compete to select the least cost plan out over the study period.

Q. - Okay. So very good. And the study period for these comparisons is 30 years. Is that correct?

MR. MARSHALL: It goes out to 2032, I believe.

Q. - 2032. So 31 years.

MR. MARSHALL: It's -- yes, but considering we are at 2006 it accommodates a 32 -- a 25 year life of Point Lepreau after it comes back. So it goes to the end of that life in 2032.

Q. - Right. But the actual analysis covers a period of 30 years?

MR. MARSHALL: The -- yes, it includes the -- the effects -- differential effects of Lepreau prior to 2006. So it models everything from 2001, '2 forward.

Q. - Okay. So where you are comparing the costs from this methodology, refurbishment with that of natural gas, and then we look at the difference whether an advantage or disadvantage, it would be -- then it's -- to think of it on an annual basis we could divide those figures by 30 years to get us at an annual difference?

MR. MARSHALL: In that present value dollars. Those are -- those are net present value dollars in 2001.

Q. - Correct. And the difference on an annual basis, could we simply to get the annual figure divide it by 30?

MR. MARSHALL: That wouldn't -- that's not the right calculation to do. A net present value is a net present value of the difference between the total cash flows.

Q. - Okay. But the difference here is -- the difference here in this evidence is over 30 years. Is that correct?

MR. MARSHALL: Yes. Everything from 2001 out to 2006 is pretty much common, so the --

Q. - But it's in here?

MR. MARSHALL: It's there.

Q. - Yes. Okay.

MR. MARSHALL: And there are other huge common things in the

analysis. So we are really looking at it on a 25 year -- 26 years for the gas unit, from 2006 to 2032.

Q. - Okay. Now as I understand this table using your methodology, the difference in the base case between the proposed refurbishment and the natural gas option over this period of time is $234 million in favor of the refurbishment option?

MR. MARSHALL: Yes.

Q. - Okay. So then you have run a number of analyses varying individual variables, is that correct, in this table?

MR. MARSHALL: Yes.

Q. - And if we could go to the discount rate 9.33 percent as a variable. Why would you pick 9.33 percent particularly?

MR. MARSHALL: The -- that discount rate was selected as an equivalent private corporation discount rate. It was modelled on Nova Scotia Power data.

Q. - Okay. So like Nova Scotia Power has to operate like a private company and that's the discount rate they would use, 9.33 percent?

MR. MARSHALL: That's our estimate of a discount rate they would use.

Q. - Okay. And that reduces the value -- or the difference between the Lepreau option and the natural gas option to -- - from 234 million to 136 million in your sensitivity

analysis over 30 years?

MR. MARSHALL: That's correct.

Q. - Now with respect to this reduced capacity factor, this is -- the reduced factor you are using is 80 percent as opposed to 89 percent. Is that the difference in this variable?

MR. MARSHALL: Yes, that's correct. And I would like to point out that there was an error in that analysis that was corrected in a response to an interrogatory. So the numbers in that table in the original evidence filing were corrected in an interrogatory.

The number in the refurbishment plan total is 6701 should have $51 million subtracted from it. So it would be replaced by 6649. And the resulting advantage on the right-hand side instead of 74 should be 126.

Q. - Thank you, Mr. Marshall. Are there any other errors that need to be corrected in this table?

MR. MARSHALL: No.

Q. - Thank you. So just to get back to this then. This is where you have chosen to assume that the reactor operated at 80 percent capacity factor, which is instead of 89 percent which is the figure at which you neither have to pay AECL under this regime or they don't provide any payments to you. Is that correct?

MR. MARSHALL: That's correct.

Q. - Right. So we would go from there, from 234 million to 126 million if we assumed an 80 percent capacity factor over the life of a refurbished Lepreau. Then that takes us -- let me go back up to the load forecast. Now here -- we talked about this a little bit earlier. This assumes a 13 percent reduction in load over this period. Is that correct?

MR. MARSHALL: It's the 13 percent reduction in demand in the tenth year of the forecast. And it's phased in over the forecast to that point.

Q. - Okay. And as you said earlier, if you looked at that in terms of industrial load, that would represent around 400 megawatts of industrial load leaving the system?

MR. MARSHALL: Roughly we had said that, yes.

Q. - Roughly, yes. So on balance that's within the margin of error you get with your 10 year load forecast?

MR. MARSHALL: No. That's the -- that's the agreed on range for a sensitivity on a high load and a low load that was agreed to at the Generic Hearing last year.

Q. - It's just that I recall from the Load Forecast Hearings that the 1990 load forecast over-estimated your load in 2000 by over 500 megawatts, and on balance that's considered reasonable.

MR. MARSHALL: I don't know if it was reasonable. It was the basis, I believe, to determine a 13 percent difference to look at.

Q. - So it's basically looking at the kind of variation in load forecast you have seen in the past?

MR. MARSHALL: It was based -- done from the Generic Hearing based on, I think, the difference from 1990 to 2000.

Q. - And that would reduce the -- a difference -- or the difference between the gas and Lepreau refurbishment option by -- down to $8 million over this 30 year period, correct?

MR. MARSHALL: That's correct.

Q. - And if we look at the other -- another variable you used here was high gas price and low gas price. And in this analysis it's the low gas price which is the one that actually reduces the advantage to the point where the natural gas has the advantage in the amount of $48 million over that period. Is that correct?

MR. MARSHALL: Yes.

Q. - Now if you flip down to high capital costs, we had a lot of discussion in Panel A about how the capital costs at Point Lepreau might change based on various risks, some of which Mr. White called show stoppers. This increase -- potential increase of 25 percent in capital costs, where

did that number come from?

MR. MARSHALL: That was agreed on at the Generic Hearing last year.

Q. - Yes. I was just trying to recall what the basis for the estimate was. Do you recall?

MR. MARSHALL: I don't recall.

Q. - But in any event if the capital costs increased by 25 percent, we would see that 234 million advantage for Lepreau refurbishment over 30 years drop to 111 million. That's what you are estimating here?

MR. MARSHALL: Yes.

Q. - Yes. Now if we could turn to exhibit A-13, CCNB supplementary 14. That's A-13. CCNB supplementary 14. There is a spreadsheet following page 18.

MR. MARSHALL: Yes, I have it.

Q. - Now in addition to looking at individual variables you carried out a stress case. Not this one, but for the evidence originally you carried out a stress case to look at how that might affect the comparative difference between the gas and the refurbishment option. Is that correct?

MR. MARSHALL: Yes.

Q. - Can you just remind us what the stress -- that stress case involved?

MR. MARSHALL: It's on page 33 of the original evidence, Volume A-1, page 33 of Appendix B-2.

Q. - But just were the variables that you changed for the stress case?

MR. MARSHALL: The variables were a low gas price, a low export market, a capital cost increase and a reduced capacity factor. So we have used four of those sensitivities that were on table 4-4.

And I would like to point out again that in that stress case on page 33, the error of the 80 percent capacity factor was also pointed out in response to interrogatories and that that case needs a $52 million adjustment made to it as well. So instead of being 139 million it should be 87 million.

Q. - And the result was -- am I reading this correctly -- a 332 million advantage to natural gas?

MR. MARSHALL: Reading which?

Q. - Just the results of that stress case that you --

MR. MARSHALL: The original stress case?

Q. - Yes.

MR. MARSHALL: The original stress case had an advantage of 139 million -- oh, wait a minute. Okay. That's -- the original stress case was done including CO2 costs of $15 a ton. And the disadvantage for Lepreau was 139 million

originally and it was corrected to 87 million as a disadvantage to Lepreau in the original evidence.

Q. - So in that case there was a 87 -- corrected $87 million advantage to gas in your stress case, is that correct? Is that what you are saying?

MR. MARSHALL: That's correct. And that was -- that correction was made in response to CCNB 95, if somebody is looking for a reference on it.

Q. - Now we asked you to repeat the stress case in the spreadsheet here that I referred to in CCNB supplementary 14, a couple of minutes ago. And the only difference in that stress case was that we asked you to take out the CO2 costs. Is that an accurate portrayal of how this stress case that we had you perform differs from the original one?

MR. MARSHALL: Supplemental 14 has five parts to it, (a) to (e), which one are we talking about?

Q. - I'm talking about the first -- 14(d), the first spreadsheet. And there is a little -- just base case, stress case number 1.

MR. MARSHALL: Without CO2 costs, okay.

Q. - Right. So our understanding was that it's the same stress case that you originally performed, but taking out the CO2 costs?

MR. MARSHALL: That's correct.

Q. - That's correct. Now the summary of the results of this is in a little box above the heading for the table, which suggests that if you take out the CO2 costs the advantage to gas becomes 227 million as opposed to the 87 million you just mentioned. Is that correct?

MR. MARSHALL: Yes. That's what this analysis shows. Also I should point out though that we in response to doing that analysis we point out that the -- this particular spreadsheet evaluation using the appendix B-2 is only valid for cost differences or minor fuel price differences rather than it cannot model the differential energy related to the change in export sales are some of the factors that are in that stress case. So there is a limitation in the value of that calculation. That's all I want to point out.

MR. SECORD: Just following up on that, Mr. Marshall. If I could direct your attention to exhibit A-5, which is a response to CCNB interrogatory 95.

MR. MARSHALL: Yes.

MR. SECORD: In that response at the bottom of the page it reports on the stress case results without CO2 and it gives a natural gas advantage of 332 million net present value.

MR. MARSHALL: That's correct.

MR. SECORD: Would it be correct to say -- given the limitations of the previous fold-out diagram which was in supplemental 14, would this be a better number -- given the limitations of the other spreadsheet analysis that actually the 332 advantage to natural gas is a better estimate of the implications of the stress case without CO2?

MR. MARSHALL: Yes, it is. I didn't say that the limitations were always in favor of Lepreau in this case. I said the model has limitations.

Q. - Thank you. Now you have used the CO2 costs throughout the analysis in different places and I'm wondering if we could turn to -- well now we need to know what the exhibit number is for the DRI-WEFA analysis.

MR. MARSHALL: We don't have a copy of that.

Q. - Okay. I thought we were going to do that over lunch.

CHAIRMAN: The number -- number one, it's not an exhibit.

MR. COON: Sorry. Correct.

CHAIRMAN: And I will mark it for identification, Mr. Coon.

MR. COON: I stand corrected.

CHAIRMAN: Ident. number. That will be Ident. 10.

MR. COON: Ident. 10?

CHAIRMAN: That's correct.

Q. - Mr. Marshall, have you got a copy of ident. 10 now?

MR. MARSHALL: Yes.

Q. - Are you familiar with this study?

MR. MARSHALL: I read it once.

Q. - Are you familiar with the consultants at all that did this study?

MR. MARSHALL: I spoke to them on the phone a couple of times to give them the information and responded to requests for information that they had in order to do the study.

Q. - So you did provide them with some --

MR. MARSHALL: Yes.

Q. - -- helpful information? Thank you.

Now if we could turn to page 6 of ident. 10. In the third paragraph up from the bottom, the consultants address this issue of how you are using CO2 value, CO2 costs in your analysis.

And at the end of that paragraph they say "DRI-WEFA expects that economics of compliance with the CO2 standard are such that it will be many years before a standard is put in place. It is our opinion that it would be speculative to include these benefits in the analysis."

Do you agree with that, Mr. Marshall?

MR. MARSHALL: No. I don't agree with it.

Q. - Mr. Marshall, are you familiar -- well, is there any legislation in Canada currently providing for CO2 credits?

MR. MARSHALL: Legislation? No. Not that I'm aware of.

Q. - Are you familiar with the Federal Government's recently released options paper on climate action?

MR. MARSHALL: I have reviewed it briefly, yes.

Q. - And isn't it the case that in that options paper they present four separate options for tackling this issue in Canada?

MR. MARSHALL: Yes.

Q. - And isn't it the case that one of those options has absolutely no CO2 trading in it, be option 2?

MR. MARSHALL: Option 2? I guess option 2, yes, there is no trading mechanism in option 2.

Q. - And in option 1 the trading proposal that is made there would not provide NB Power with any CO2 credits, isn't that correct?

MR. MARSHALL: No. That is correct. Option 1 is essentially a carbon tax which will just increase everybody's cost of energy.

Q. - So two of those options don't even provide the CO2 credits here that you are using in your analysis, correct?

MR. MARSHALL: The option 1 still assigns costs to energy and to carbon on all end uses and passes it through the

system. So it has in it a cost of carbon emissions in option 1.

Q. - Indeed. But if that were in place you would have to redo your analysis. It would be -- the numbers would come out different than what --

MR. MARSHALL: The numbers would be different. They may be -- they may be higher. They may be lower. I haven't done that.

Q. - Right. So then indeed it is quite speculative, in the absence of legislation, providing for CO2 credits and even recognizing that two of the options the Federal Government has under consideration don't provide for these kinds of CO2 credits, entirely speculative on your part to include CO2 credits in your analysis to compare the refurbishment option with other options, correct?

MR. MARSHALL: No. I do not believe it is entirely speculative at all. The New England Governors and Eastern Canadian Premiers have set targets for CO2, have itemized an intent to set up a registry and a trading mechanism in order to achieve those ends.

The Federal Government programs have in their options alternatives including trading mechanisms. And so I think it is a reasonable assumption that we consider some type of costing of CO2.

Because we are not going to achieve the goals of Kyoto. Whether we ratify it or not we are not going to achieve the goals of reduced carbon emissions into the future at zero cost. There will be some cost of achieving those reductions. It is only prudent that we include some evaluation of what those costs are.

Q. - What differences would there be in your analysis if Point Lepreau was its own incorporated company and the rest of NB Power was split up into other companies?

MR. MORRISON: Mr. Chairman, I think we have already dealt with these hypotheticals at the outset of this hearing.

CHAIRMAN: Mr. Coon, I will let you ask that one question. But frankly we could go on and speculate till the cows come home. I have mentioned that before.

MR. COON: Precisely my point, Mr. Chairman.

Q. - But go ahead and answer the question, Mr. Marshall?

MR. MARSHALL: I think the issue of Point Lepreau, if it was set up as a separate company -- the evidence on this hearing demonstrates the need for the capacity in 2006 on. The evidence demonstrates the lowest cost way to achieve it is with Lepreau refurbishment.

The issue of restructuring the corporation is one of what is the way of financing it, whether there is third party investment or not. It is how does the government go

forward to structure that corporation and finance achieving the project?

Q. - Okay. I would like to turn now to somewhat what we have begun in terms of a book, exhibit A-6, CCNB-102.

Now if we would go to the minutes --

CHAIRMAN: A-6?

MR. COON: Yes. A-6.

CHAIRMAN: And where are we in that, sir?

MR. COON: If we would go to the minutes of the February 23rd 2000 meeting. Yes. That is CCNB-102. And it is early on.

MR. SOLLOWS: 2001?

MR. COON: 2000.

MR. SOLLOWS: 2000?

MR. COON: February 23rd 2000. It is early on.

MR. MARSHALL: There is no February 23rd 2000.

MR. SOLLOWS: Yes, there is.

Q. - A very special meeting. Now in these minutes is a slide presentation, "Refurbishment Project Execution Plan." And these pages are numbered.

And I would like you to go to page 8. Now these are a series of slides dealing with the proposal from NUCO to lease Point Lepreau, pay for its refurbishment and then sell the power back to NB Power.

And in the sort of middle slide on the right-hand side here, "Status of NUCO Proposal", it says "Analysis of the proposal against a combined cycle natural gas alternative showed that the NUCO proposal was more costly."

And presumably it is one of the reasons it didn't go forward. And that it was more costly than in fact the alternative of building a natural gas plant.

I'm wondering if you could inform us as to why in this case a proposal to refurbish Point Lepreau was found by NB Power to be more costly than actually shutting it down and building a new gas plant?

MR. MARSHALL: That proposal from NUCO was for them to do it. And their price was higher than the gas plant and significantly higher than what NB Power viewed we could do it with AECL.

So there is no connection between the NUCO price of refurbishment and the current price on the evidence.

Q. - And NUCO was a private sector consortium?

MR. MARSHALL: Yes.

Q. - Thank you. Sticking with the gas, I have a document here I would like marked for identification purposes.

CHAIRMAN: I have a document which purports to be on NB Power letterhead addressed to the Secretary of the National Energy Board dated May the 7th, 2002 which will

be marked for identification 11.

Q. - Now ident. 11 is a copy of a letter from Kenneth Little, Vice-President of Regulatory Affairs at NB Power. And it was submitted to the Secretary of the National Energy Board with respect to the Province of New Brunswick's application respecting shortterm export order procedures on natural gas.

What I would like you to look down at is the bottom paragraph, Mr. Marshall, the last sentence where it says "NB Power is considering additional natural gas fired generation projects as part of its generation mix."

My question is is NB Power anticipating bringing forward an application for a natural gas fired generation project?

MR. MARSHALL: At this time, no. Our consideration of natural gas as an option for part of our generation mix is already on the record before this Board.

It is part of the evidence of this hearing that we are looking at gas as the alternative to Point Lepreau.

Q. - So that is the actual -- the reference then in this letter to the Natural Energy Board is this was with respect to the notion that if Lepreau is not approved you would be looking for natural gas fired generation projects?

MR. MARSHALL: Well, we would be looking for the lowest cost option we can come up with. And if it gas then that is what we would be looking at.

MR. COON: Thank you.

Q. - A couple of questions for you, Ms. MacFarlane. Where do you anticipate NB Power obtaining the capital to carry out the Refurbishment Project if it received approval?

MS. MACFARLANE: At the time the evidence was filed we anticipated that we would obtain financing, some 50 percent of the financing for the two projects would come from cash flow. The rest of it would come through borrowing through the Province of New Brunswick.

Q. - So 50 percent from borrowing through the Province and then 50 percent through cash flow. Can you explain a little more for me what you mean by cash flow?

MS. MACFARLANE: If you look at the evidence that was submitted on NB Power's eight-year forecast, NB Power does have strong annual cash flows.

And the first call against those cash flows is ongoing annual capital expenditures. But thereafter we can use those cash flows to either reduce debt or make future investments.

And over the planned period the intention was to use that cash flow over and above ongoing capitals year to

year to invest in Coleson Cove and Point Lepreau.

Q. - So the cash flow is cash generated from sales to New Brunswick or sales, export sales outside to the other nearby provinces?

MS. MACFARLANE: That is correct.

Q. - Could I have you look at exhibit A-21 which is the Dominion Bond Rating Service Limited's report of September 18th 2001?

MS. MACFARLANE: Yes. I have it.

Q. - And if I could get -- well, these pages -- oh, yes. They are numbered at the top. In the left-hand corner at the top they are numbered. And looking at page 3 there is a table --

CHAIRMAN: I'm sorry. Are you looking at page 3? Or are you looking at page 2? Sorry. It is page 3 of the exhibit. And it is numbered.

MR. COON: Yes.

CHAIRMAN: I misread it. Sorry. Go ahead, Mr. Coon.

Q. - There is a table at the bottom that identifies the revenues for NB Power.

CHAIRMAN: Just a second. Go ahead, Mr. Coon.

Q. - Thank you. So there is a table on the bottom of page 3 entitled, Revenues, and the third column on the right is entitled, Unit Revenues, Cents per Kilowatt Hours Sold,

and we can see those unit revenues for 2001, 2000 and 1999. Now my understanding, Ms. MacFarlane, is these indicate on a kilowatt hour basis revenues from the various customer sectors that NB Power receives, is that correct?

MS. MACFARLANE: I would have to look more closely at what is behind those numbers in order to agree with that.

Q. - How much more closely?

MS. MACFARLANE: Well perhaps if I could look at it at the next break I could answer that question.

Q. - Okay. Well we might not have a next break, I don't know.

CHAIRMAN: Frankly, we can take it and then the Board can make some copies of A-21.

MR. COON: Very good.

CHAIRMAN: So we will take a ten minute recess.

(Recess)

CHAIRMAN: Go ahead, Mr. Coon.

Q. - We were just talking about -- well you were saying 50 percent of the cost of Point Lepreau's refurbishment would you anticipate come from cash flow. And I was referring to exhibit A-21, the Dominion Bond Rating Service Limited's 2001 report on NB Power, and on page 3 on this table there is a column described as Unit Revenues Cents per Kilowatt Hours Sold. And my understanding of it was

this is on a kilowatt hour basis how much NB Power earns from its various customers, is that correct?

MS. MACFARLANE: The third column?

Q. - The third column, yes.

MS. MACFARLANE: The third column in the table is based on the first column divided by the second column.

Q. - Correct. So that's giving you on a kilowatt hour basis based on total revenue from these customers -- different customer sectors, what the earnings are?

MS. MACFARLANE: That's right.

Q. - Now Mr. Marshall earlier in the day said that NB Power's cost of production is five cents per kilowatt hour. If we look at the year 2001 under unit revenues for the industrial sector, the unit revenues were 4.91 cents per kilowatt hour from the industrial sector, and that would be below your cost of production, is that correct?

MR. MARSHALL: No. The -- it depends how you interpret that

number. If you interpret it literally the way you have the answer would be yes, it's close to the cost of production. The cost of production when I say five cents a kilowatt hour is the cost of the total generation production system. That is the cost of the total energy produced by the generation system divided by all of the costs of the generation system. And it accounts for the

system load factors of the different classes and all of the exports and everything else.

The cost of the -- of supplying generation to different customer classes is different. So to supply it to some customer classes the cost is higher than five cents. To supply to other customer classes it's lower than five cents.

And industrial being a very high load factor customer class, the cost of supplying energy to the industrial class is lower than the five cents.

Q. - What would that cost be, Mr. Marshall?

MR. MARSHALL: I don't have it right now.

Q. - Could that be provided for tomorrow, please?

MR. MARSHALL: We could do an estimate.

Q. - Okay. And continuing down then, the unit revenue from the residential sector to NB Power 2001 was 7.94 cents per kilowatt hour, is that correct, Ms. MacFarlane?

MS. MACFARLANE: On the basis of this calculation, yes, it is.

Q. - Yes. And do we have handy the costs of production to serve the residential customers?

MS. MACFARLANE: No, we don't.

Q. - Could that be provided as well?

MS. MACFARLANE: We can estimate it, yes.

Q. - Thank you. So in referring to financing a refurbishment of Point Lepreau of 50 percent from cash flow you are, if we go back to column 1, talking about using some portion of the -- well the total here is I guess $1.26 billion of revenues for 2001 but going forward some portion of that, whatever those revenues are in the future, to help to cover the cost of the refurbishment, is that correct?

MS. MACFARLANE: If you look in this same report on page 1 at the financial information table at the bottom, you can see the sixth line down is operating cash flow, and this would be all of the cash revenues less all of the cash expenses in the corporation. You can see the cash flows over the past several years and that since 1999 the cash flows have been in excess of 200 million. Our financial forecast out to 08/09 would suggest that they would continue to be in those levels. It's those operating cash flows that we will be using to partially fund these projects, Coleson Cove and Point Lepreau.

I would also draw your attention to the fourth line down, cash flow divided by capital expenditures. I had indicated earlier that the first draw on operating cash flow was ongoing annual capital expenditures, and in fact because we have had no major projects in the past that has been the only draw for the last several years on operating

cash flow other than debt reduction.

So this is measuring over the past several years the degree to which your operating cash flow is greater than your capital expenditures in a ratio. And you can see the numbers 1.8 times greater in 2001, 2.5 times greater in 2000, 3.7 times greater in 1999, 2.6 times greater in 1998.

It's that excess over those ongoing annual expenditures that has allowed us to reduce our debt and it's that excess in the future that will let us contribute towards the cost of these projects and avoid debt.

Q. - So on that matter, if -- so that's very, very helpful. If you are using some of this -- well for example 2001 $214 million from your operating cash flow towards refurbishment -- well out to 2006, whatever that figure is -- what does that mean in terms of NB Power's operations? In other words, where is that money then not going if you are going to funnel it into -- part of it into covering refurbishment costs?

MS. MACFARLANE: In the past there have been two draws on that money. The first one is ongoing annual capital expenditures, which have been in the 100 to $120 million year range. The remainder of the money has gone to reduce our debt.

Over the period of the financial plan we will not be reducing debt. In fact w will be a net borrower. But we will only have to borrow approximately half of the capital cost of these two projects. The rest of it will come from these operating cash flows and their excess over and above the normal ongoing capital expenditures. That excess will be used to fund these projects.

Q. - Thank you. Mr. Marshall, in Panel A Mr. White talked about a number of show-stoppers for this refurbishment project, which he described as high risk. Are you familiar with those show-stoppers?

MR. MARSHALL: I am not, no.

Q. - Oh, you are not. Okay. That makes that one easy I guess. Finally --

CHAIRMAN: Mr. Coon, I will interrupt only to assist you in this regard. The easy way to do it you know is to take the transcript of the last day's hearing and read to him what Mr. White has said, and then ask him for his comment on it.

MR. COON: Indeed.

CHAIRMAN: That's the simple way to put it to him.

MR. COON: Thanks for the advice. Mr. Chairman, I think we will just forego that line. Maybe someone else will pick it up.

Q. - My final questions for you, Mr. Marshall, are in your opinion was the original investment in Point Lepreau a good investment?

MR. MORRISON: Mr. Chairman, I don't think that Mr. Marshall is qualified to give an opinion on the initial investment of Point Lepreau.

CHAIRMAN: Go ahead, witness. If you want to answer it, go ahead.

MR. MARSHALL: I don't have an opinion on -- to offer an opinion right now without going through an analysis of the costs and the value over the whole time and to go through all that I think would be imprudent.

Q. - So despite NB Power having to write $450 million off on Point Lepreau so far you have no opinion?

MR. MARSHALL: The $450 million has nothing to do with the economic value of the project over its life. That's an accounting entry. I think Ms. MacFarlane could explain that better.

MR. COON: All right. Thank you, Panelists and Mr. Chairman. That finishes our cross.

CHAIRMAN: Thank you, Mr. Coon. We are going to break, I think this is an appropriate time, for the evening, but Commissioner Sollows had something he wanted to request the Panel to do if they could.

MR. SOLLOWS: Number 10, looking at the report from the Dominion Bond Rating Service in the Revenues table, I see it gives unit revenues in cents per kilowatt hour sold for 2001, 2000 and 1999, and you said that's just a combination of the division of the revenue by the sales per class. Would you be able to provide us over the next few days the similar numbers broken down by class going back say to 1990 for the past decade?

MS. MACFARLANE: I can certainly make an attempt.

MR. SOLLOWS: Thank you.

CHAIRMAN: Do you want all classes or just residential?

MR. SOLLOWS: I am particularly interested in residential classes. Yes, particularly the residential class.

CHAIRMAN: Yes. In other words, if you can do it do it for residential. I think that's what we are saying.

MR. SOLLOWS: Yes.

CHAIRMAN: Anybody been speaking to Mr. Craik to see if he in fact wishes to cross?

MR. THOMPSON: I believe it is Mr. Craik's intention to continue to participate but not every day and we will advise him of the timing of --

CHAIRMAN: Would you do that?

MR. THOMPSON: Yes.

CHAIRMAN: Because tomorrow first thing would be his turn.

Okay. Thank you. Mr. Albert, do you have any idea how long Mr. Gillis would guesstimate in taking with this panel?

What I am trying to do is get a sense of timing here because I know Mr. Adams has been bugging Mr. MacNutt as to when he thinks he would be called upon to give testimony, et cetera. And I am just trying to get a handle on it here.

Has Mr. Gillis shared that information with you, Mr. Albert?

MR. ALBERT: No, Mr. Chairman.

CHAIRMAN: Mr. Hyslop, how long do you think the Province's cross might take?

MR. HYSLOP: I can't see it extending beyond half a day, Mr. Chairman. However, Mr. Barnett is coming to town tonight and that can change.

CHAIRMAN: I hear what you are saying. Mr. Albert, will you try and locate Mr. Gillis overnight tonight and just get a guesstimate from him if you wouldn't mind.

I guess in fact he would be next up anyway. Good. We will arise then and reconvene -- sorry, Mr. Morrison?

MR. MORRISON: Mr. Chairman, there is one matter. Before the lunch break this morning I had indicated that I may be raising a question put to the panel with respect to this

234 million net present value advantage and the 3 1/2 percent that was discussed on the record.

I have spoken to Mr. Hyslop. He doesn't intend to pursue or he is not certain whether he will pursue that line of questioning. But having considered it I am not going to place -- put the question to the panel. I just thought I would have that clarified for the record.

CHAIRMAN: You are saying you would like to put that question?

MR. MORRISON: No. We have decided that we are just not going to bother quite frankly.

CHAIRMAN: That is good to hear, Mr. Morrison. Good. We will rise until 9:30 tomorrow morning then.

(Adjourned)

Certified to be a true transcript of the proceedings of this hearing as recorded by me, to the best of my ability.

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