New Brunswick Board of Commissioners of Public Utilities

In the Matter of an application by the NBP Distribution & Customer Service Corporation (DISCO) for changes to its Charges, Rates and Tolls - Load Forecast

Delta Hotel, Saint John, N.B.

November 21st 2005

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Undertakings

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Delta Hotel, Saint John, N.B.
November 21st 2005

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BOARD STAFF:	Doug Goss
	John Lawton
BOARD SECRETARY:	Lorraine Légère

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CHAIRMAN: Good morning, ladies and gentlemen. Could I have appearances for the Applicant?

MR. MORRISON: Good morning, Mr. Chairman, Commissioners. Terry Morrison. With me is David Hashey. And from Disco is Lori Clark and Neil Larlee.

CHAIRMAN: Thank you, Mr. Morrison. Canadian Manufacturers and Exporters?

MR. PLANTE: Dave Plante.

CHAIRMAN: Good morning, Mr. Plante. Conservation Council of New Brunswick? Eastern Wind? Enbridge Gas New Brunswick? Irving Group of companies?

We are being deserted. Jolly Farmer is not here. Rogers Cable? Self-represented individuals? Municipal Utilities?

MR. GORMAN: Good morning, Mr. Chairman and Commissioners. Attendance certainly seems off this morning. Anyway, Raymond Gorman and Dana Young representing the Municipal Utilities.

CHAIRMAN: Thank you, Mr. Gorman. You are absolutely right. Vibrant Communities? Public Intervenor?

MR. HYSLOP: Good morning, Mr. Chairman. Peter Hyslop with Don Barnett, Bob O'Rourke and Ms. Power this morning.

CHAIRMAN: Good. Thanks, Mr. Hyslop.

Mr. MacNutt, who is with you today?

MR. MACNUTT: Mr. Chairman, I have with me Doug Goss, Senior Adviser and John Lawton, Adviser.

CHAIRMAN: Thanks, Mr. MacNutt. Any Informal Interveners? I don't think so.

Okay. The latter part of last week the Board was peppered with letters from Mr. Hyslop and also Mr. Stewart for some of the Irving Group. And then we got some responses from the Applicant. It has to do with Motions Day.

And my understanding is there is a consensus now to adjourn Motions Day over to that first week of December.

Mr. Hashey, any comments?

MR. HASHEY: That is correct, Mr. Chairman. The dates discussed have been the 1st and/or 2nd of December, if that is convenient. I heard this morning there may be a space problem. It seems to me there are very few of us involved in that Motions Day and really that the Board's chambers would probably be an adequate location, if that would be sufficient.

I mean, there are two issues really. There is the issues of confidentiality that we have distributed some materials on today. But I think a lot of that is going to get boiled down to the one that concerns Mr. Stewart. I don't think the others are going to be a significant problem. So the confidentiality issue won't be too tough.

Whether anything comes out of the new set of IRs on confidentiality, the good news is I guess if we set that date we can deal with everything at that time and not have to come back on the IRs that are received today. We received some already from the PUB. There are others to come today as well.

So it would seem to me that if we could deal with that

and the issues of whether we should answer or not. And frankly in that area we have it boiled down really into three or four categories at most. It can be easily categorized where the issues are going to be. And we can define what we have to discuss and argue about.

CHAIRMAN: Okay. Thanks, Mr. Hashey.

Now Mr. Gorman, the Municipal Utilities are not interested, as I understand it?

MR. GORMAN: In Motions Day?

CHAIRMAN: Yes.

MR. GORMAN: Well, at this point in time I think there are still some issues with respect to our question. So yes, we would be interested.

CHAIRMAN: All right. So that would be the Public Intervenor, the Municipal Utilities, the Irving Group and the Applicant. I see no reason why -- and Board staff of course. I see no reason why we can't all squeeze into the Board's premises. So we will go on that regard.

Now I would like it on the record that, as we have done previously, that perhaps the full panel not be there to rule on it, on the confidentiality issue. Is that acceptable to everyone?

Let me put it this way. If it is not acceptable, go on the record and say so now. Because I don't -- in that

regard I don't think it is necessary to bring the whole panel back in.

MR. HASHEY: That is very acceptable.

CHAIRMAN: Okay.

MR. GORMAN: It is acceptable to us as well.

CHAIRMAN: Yes. Good.

MR. HYSLOP: And us.

CHAIRMAN: Okay. All right. That is great. So is the 2nd acceptable to everyone?

MR. HASHEY: That would be acceptable, the best date for us.

MR. GORMAN: That is fine.

MR. HYSLOP: Our preference would be the 1st, only because I think Mr. O'Rourke has exam duties on the 2nd. But --

CHAIRMAN: Mr. O'Rourke has what?

MR. HYSLOP: Exam duties or vigilating exams or something like that.

CHAIRMAN: Oh. I was hoping he would still write them. All right. No. The 1st -- well, Dr. Sollows is the same way I think. But is the 1st okay, Madam Secretary?

MRS. LEGERE: It is not okay at the hotel.

CHAIRMAN: No, no. We will have it at the Board's premises. But on our calendar it is clear? I don't know. What is the 1st? It is Thursday.

MRS. LEGERE: Yes, it is.

CHAIRMAN: Is there anything else going on on the 30th or the last day of November?

MRS. LEGERE: There is the DRL hearing possibly.

CHAIRMAN: That is 29 and 30? Yes. Okay. All right. Well, Motions Day will be put off until 9:30 on Thursday, the 1st of December at the Board's premises.

There will be no need for simultaneous translation at that, will there, gentlemen?

MR. HASHEY: No, Mr. Chairman.

CHAIRMAN: No. Okay. Ms. Gilbert, you can note that on that occasion. And Madam Secretary, what about -- we don't need Tel-Av either, do we, in our premises?

MRS. LEGERE: No. The Court Reporter has four mikes.

MR. HASHEY: If you don't mind passing the odd mike around, why we can do away with Tel-Av as well.

CHAIRMAN: All right. That is good then. That is taken care of. I will during the break mark five volumes of responses to the Revenue IRs dated November the 14th. And I don't have them right here. So I won't bother with it. But I presume that they should go sequentially from A-54. There are five volumes, Madam Secretary?

MRS. LEGERE: Yes.

CHAIRMAN: Okay. Anyway I will do that on the break and let you know exactly what has been marked.

So if you would like to bring up the panel on Load Forecast.

MR. MORRISON: Thank you, Mr. Chairman. I will call Neil Larlee.

CHAIRMAN: A panel of one.

NEIL LARLEE, sworn:

DIRECT EXAMINATION BY MR. MORRISON:

CHAIRMAN: Mr. Larlee, that holding up your right hand is an Americanism. We don't usually do that in our -- I didn't say it before because they were American witnesses.

But we don't do that in the British Commonwealth, do we, Mr. Hashey? I don't think so, no.

MR. LARLEE: Thank you. I will take note of that.

DR. SOLLOWS: There will be an exam later.

Q.1 - Good morning, Mr. Larlee.

A. Good morning.

Q.2 - Just for the record, if you can briefly describe your position at Disco?

A. I'm the Manager of Load Forecasting and Regulatory Studies at NB Power Distribution Customer Services.

Q.3 - Now there is a load forecast which has been marked as exhibit A-6. Was that document prepared under your direction?

A. Yes, it was.

Q.4 - And do you adopt that document Load Forecast 2005-2015, exhibit A-6, as your evidence today?

A. Yes, I do.

Q.5 - In preparing the revenue requirement evidence, if you -- and I believe -- you don't have to turn this up -- it is exhibit A-50, tab 5, the evidence of Lori Clark.

What was your involvement with the revenue forecast evidence provided in Ms. Clark's evidence?

A. Ms. Clark's evidence is based upon volume forecast or the sales forecast for 2006-2007. And that forecast is essentially one year, a one-year slice of the 10-year load forecast which is exhibit A-6.

And that load forecast was, as I said earlier, prepared under my direction.

Q.6 - And how does the load forecast impact the rate hearing?

A. The load forecast really impacts the rate hearing in two ways. (1) it provides the energy requirement that Disco has to supply and purchase for the test year. And Disco has to pay for that purchased power. So it has a significant impact on the cost that Disco will incur.

And (2) it provides the basis for the estimate of the revenues that Disco will get for the sales of that power.

And the comparison of the budgeted revenues of course with Disco's revenue requirement determines the overall rate

increase requirement.

Q.7 - These two forecasts in revenue and the cost, do they offset each other?

A. Yes. To a certain degree they do. That is if actual sales are higher than the forecast, then Disco's costs, purchase costs will go up. As well, if sales are higher the revenues will go up.

So there is an offsetting factor. The degree of offset depends of course on the incremental or decremental costs versus incremental or decremental revenue.

Q.8 - When did this Board last review NB Power's load forecast?

A. The load forecast was last reviewed by the PUB in detail as part of the generic hearing on generation projects in 2001. And as part of that process we were asked to provide an update to the load forecast for the Point Lepreau refurbishment section of that hearing. And that forecast was updated for that purpose in 2002.

Q.9 - And following that hearing did the Board issue any findings or conclusions with respect to the load forecast evidence that was reviewed at that time?

A. Yes, they did. The Board issued a verbal decision. And the Board concluded, and I quote, that "On balance the

updated load forecast is reasonable."

Q.10 - Now I understand also that the Board mentions specific recommendations following the previous load forecast hearing. And can you outline what those were?

A. Yes. The Board made the specific recommendation related to price elasticity. And again I will quote, "Modify the model so as to include the ability to specifically adjust for the price elasticity of demand."

Q.11 - And have you taken into consideration or have you modified the load forecast to comply with that direction?

A. Yes, we did. We modified or made changes to the forecast with respect to the residential model and the general service model. Specifically the residential is an adjustment to the base forecast to account for price elasticity.

In the case of the general service model and the general service sector, we developed a new econometric model for that sector. And one of the independent variables in that model is price of electricity. So thereby the effects of elasticity are included.

Q.12 - And have you made any other changes to the forecast models?

A. Apart from those two changes, the forecast models are fundamentally the same. We have enhanced the ability to

include adjustments within the model.

We have also made some practical changes in the layout of the model to allow for improvements in the way we can do scenario analysis and to minimize the possibility of errors. But otherwise the models are fundamentally the same.

Q.13 - Now I'm going to ask you, Mr. Larlee, to outline the methodology that is used in developing the volume forecast, sales volume forecast.

MR. MORRISON: Mr. Chairman, we did prepare a little chart. It is -- I think copies have been given to the Secretary. It is just for ease of reference. It is not new evidence in any way.

Q.14 - Mr. Larlee, perhaps with the aid of the chart that I just passed out could you describe the methodology that is used in developing the sales volume forecast?

A. The methodology that we used -- that was used on 06/07 is essentially the same methodology that is used in all years of the ten year forecast. And exhibit A-6 goes into that in a fair bit of detail. And there is a summary of that methodology again in the revenue requirement evidence in exhibit A-50.

But again just to summarize one more time, and you can refer to that table, essentially there is three main

models in the forecast. There is the residential model, the general service model and industrial sector model. And those three sectors are forecast separately.

If we look first at the residential model, it is what we would call an end use model. In other words, the energy requirement of the class is built up based on the requirement of the various uses of electricity.

The general service model is an econometric model. Essentially what we are doing there is we are building a model that relates the electricity requirements for that class with external factors. And those factors are the price of electricity, economic growth, and we use gross domestic product for that, heating degree days and the previous year's sales.

The industrial model is also an econometric model and it relates the requirements for electricity in that class to the goods producing gross domestic product in New Brunswick.

Finally each of the models are adjusted for any external factors that wouldn't appear in history. And the best example of that is natural gas. We look -- if we were looking at history of consumption and uses of electricity in the residential model, for instance, we wouldn't foresee the impact of natural gas. So there is

essentially an adjustment added to take that into account.

Similarly with general service.

Each of the sector models is then subdivided into Disco's portion and the wholesale customer portion as a step to get our wholesale forecast.

And then finally all of the sector forecasts are added together to give the total requirements for Disco.

Q.15 - Mr. Larlee, what we are dealing with here today is a one year load forecast for 06/07. Are there any factors that impact on the accuracy of the load forecasts in the short-term?

A. Yes. In the short-term really there is two factors that would essentially swamp any other factors that are likely to impact on the accuracy of the forecast. And they are, one, the impact of weather.

Disco has approximately 60 percent of its residential customers that heat primarily with electricity and their consumption as a result is sensitive to weather. The forecast uses as a base assumption the long-term average for normal weather as provided by Environment Canada, and so any variation from normal will result in changes in the forecast.

The second factor that is likely to have the largest impact is industrial operations. Industrial operations

are forecast based on the most current information we have plus an allowance for growth and any partial or complete shut-down of those operations are going to have significant impact on the forecast.

MR. MORRISON: Mr. Chairman, there are a couple of clarifications that I would like to draw to the Board's attention. Mr. Larlee, or Disco, responded to PUB IR-101 which is in exhibit A-12, and I believe Mr. Larlee would like to provide some clarification to the response.

A. Yes.

Q.16 - Just a second, so they can turn that up.

A. Yes. It's --

Q.17 - Just a second, Mr. Larlee, to make sure everybody has that.

MR. MACNUTT: Could we have the reference again, please?

MR. MORRISON: It's exhibit A-12 and it's PUB IR-101. It's a seven part question. I believe there are two parts of that that you would like to draw the Board's attention to, Mr. Larlee.

A. Yes. Parts 2 and 7 of that response. In part 2 I just wanted to comment on the perspective from which that response is given. And just quoting from the response, "Disco has no hourly data below the level of total in-province supply."

This statement comes from a narrower perspective than perhaps we should have used, and it comes from a perspective of load forecasting where really the load forecast that we are producing here is not an hourly forecast. And so hourly data is not essential to the forecast.

What happens is in the load forecasting we rely on what we can get through reporting, and there is no direct reporting for any other hourly number than system net or the total system.

That is not to say that Disco can't produce estimates for some classes and indeed we did in other responses to interrogatories. We produced hourly profile estimates for residential based on load research and we produced hourly profile estimates for industrial transmission because 95 percent of that load is indeed metered on an hourly or even shorter time interval basis.

Q.18 - I think you also want to make some clarification to the response in part 7 of that IR.

A. Yes. Part 7 asks the question about a statement that is in the load forecast in exhibit A-6, and that statement is related to export sales that occur within the province but -- export sales losses rather -- that occur within the province but are the result of that energy leaving the

province for export purposes.

So when we forecast the whole provincial load, we are actually capturing those losses related to export sales. And the statement of load forecast says losses related to export sales are negligible at time of peak. And in the response to the IR we attempted to clarify this statement by describing how that peak hour -- and we are talking about a demand number here -- how the peak hour demand is implicitly included in the forecast related to those export sales losses.

And I see now how that statement that is in the load forecast is misleading in that it implies that those peak hour losses are zero. And I just wanted to assure the Board that we will be looking at that wording in the next forecast that we produce and be re-wording it accordingly.

MR. MORRISON: That concludes the direct examination, Mr. Chairman, and Mr. Larlee is available for cross examination.

MR. DUMONT: Mr. Larlee, when you talk about losses due to export sales are you talking loss of sales or losses occurring because of those sales?

A. Losses occurring because of those sales.

MR. DUMONT: Than you.

A. They are system losses on the transmission system.

MR. DUMONT: Thank you.

CHAIRMAN: Mr. Plante, do you have any questions of this witness?

MR. PLANTE: No, Mr. Chairman.

CHAIRMAN: Good. Thank you. I guess it would be Municipal Utilities. Mr. Gorman.

CROSS EXAMINATION BY MR. GORMAN:

MR. GORMAN: Thank you, Mr. Chairman. Good morning, Mr. Larlee.

MR. LARLEE: Good morning.

Q.19 - In your direct evidence this morning you talked about a number of variations including I think you said industrial operations and weather?

A. Yes, that's correct.

Q.20 - Now could you tell me whether or not the forecast is normalized for weather?

A. Yes, it is.

Q.21 - And what would the approach be to weather normalization? Could you explain that?

A. Well basically all of the historical data is adjusted to bring it to a normalized basis before it's analyzed as part of the forecasting process.

Q.22 - Did the last year in the forecast -- did the weather actually differ from what was put in the forecast? Was

there any variance?
A. You mean the last actual that we had for the forecast?
Q.23 - Yes.
A. Yes. Yes, it did.
Q.24 - So the forecast that we have for the upcoming year, is that weather normalized?
A. Again the way the forecast is developed we use weather normalized data and so that we will get essentially a weather normal forecast. So there isn't a distinct step where we produce a forecast, then weather normalize it. Rather it's the other way around. We weather normalize the data and produce a forecast from it.
Q.25 - You mentioned in your direct evidence today, I believe it was exhibit A-6, the long-term forecast, and of course you have as well the short-term forecast. How do these relate? How does the short-term relate to the long-term?
A. The forecast that we are talking about here is for 06/07. It is one year of the ten year long-term forecast.
Q.26 - And are they reconciled? Is there some reconciliation when the actual numbers would come in, to the long-term forecast?
A. I'm afraid I don't quite understand the question.
Q.27 - The short-term versus the actuals, are they reconciled? In other words, I guess what I'm trying to say is do you

track the difference?

A. Yes, we track the difference and we look at the difference and attempt to explain the difference.

Q.28 - Okay. And that difference, does that then become part of your long-term forecast? In other words, are the -- through this reconciliation process are changes then made to reflect the difference?

Q.29 - The actuals -- the most recent actuals that we have are put in to the forecasting process each time we do -- each time we do a forecast. So the actuals from the most recent year that we have available are included in every iteration of the forecast.

Q.30 - Now with respect to your forecast for the various rate groups -- and I'm going to refer you to exhibit A-50, direct evidence of Lori Clark, that's at tab 5 -- and if you would turn to page 11 which is your appendix dealing with revenue forecast development, and it also had reviewed -- there is no need to turn it up, but reviewed the earlier evidence of Lori Clark dealing with the previous test year when the original filing was made. And I note that the first line --

CHAIRMAN: Mr. Gorman, will you wait just a sec'. We are trying to catch up.

MR. GORMAN: Sorry.

CHAIRMAN: Sorry, Mr. Gorman. Ask the question again.

Q.31 - Okay. I'm at page 11 of exhibit A-50, appendix 1, and the first line says the forecasts are divided into three main groups, residential, general service and industrial. Do you see that?

A. Yes.

Q.32 - And where would wholesale fall? I don't see that identified as a separate category.

A. The base forecast for each of those are done on a provincial level. So essentially we are forecasting the entire province, including the wholesale or the load that would be in the wholesale service territory. And then there is a separate step once the provincial forecast -- and I use the term provincial a little loosely because we don't include Perth-Andover -- the provincial forecast is done. Then we as a separate step separate out the wholesale portion for each sales category based on the historical splits.

Q.33 - I'm not sure that I understand precisely what you have explained. Maybe if I can put it in my words and see if I understand what you are getting at.

You would take residential for example province-wide and then if you would extrapolate the numbers for wholesale from that. You don't look at them as a separate

class.

A. We look at them as a separate class but not while we are producing the provincial forecast. For instance, let's look at population. Our population numbers which we used in the residential forecast are for the province. So -- and that relates to just about all of the inputs that we are using in the forecast. They are provincial numbers.

So as a result we create a provincial forecast and then once the provincial forecast is done, then we would break out the wholesale portion.

A. And I'm just wondering what the process might be to sort of accurately take these numbers out of your provincial numbers in order to develop a forecast for the wholesale category. What would the actual process be?

A. Well it's based on the historical percentage that wholesale represents, with some adjustments. I can give you some examples.

For instance, because the service territory for the wholesale -- the service territory for the wholesale customers is fixed. In other words, it can't grow based on the Electricity Act. We put our thumb on it or we limit the growth of streetlights, as an example. So that streetlight growth -- streetlight load that we estimate

for wholesale is fixed because the service territory -- we know the service territory is fixed.

So that we do make some adjustments but on a basic level we are simply using the proportion.

Q.34 - Okay. If I can refer you to page 7 of Lori Clark's evidence, under wholesale, the second bullet talks about the -- on the second line -- I'm just giving the Board a chance to get to page 7 -- and there is a heading that says wholesale and there is two bullets -- actually three I guess if you go on to the next page.

But the second bullet says the sales volume forecast is 0.2 percent above 2005/2006. It says this growth reflects economic activity in the sector. What do you mean by the sector? Are you referring to -- what are you referring to when you say the sector?

A. Well I believe in this case I'm talking about the wholesale -- - essentially the wholesale service directory.

Q.35 - You -- I guess in referring to establishing a wholesale rate, you referred to essentially using for example a fixed number for things like street lights and that. But would you not project that there might be some growth in that sector or that area?

A. Oh absolutely. I mean let's take for example the general service model. The general service model uses as

one of its inputs changes in the New Brunswick gross domestic product. So the change that -- there would be a portion of that growth that would be related to growth that would occur in the wholesale service territory. So there is definitely some growth there.

And what I am trying to say in lines 23 through 28 is that the wholesale service territory will see some growth. However, it is -- or we are forecasting that it will be offset by the impacts of natural gas.

MR. GORMAN: No further questions.

CHAIRMAN: Thanks, Mr. Gorman. Mr. Hyslop, do you want to come up now or do you want us to take our break and -- I don't know how many questions you have for the witness.

MR. HYSLOP: It's hard to say exactly, but I expect I will be a good solid hour, Mr. Chairman. So --

CHAIRMAN: Well why don't we take our break now then and come back in in 15 minutes.

(Recess)

MR. MACNUTT: Counsel are meeting in a meeting room and working out variations in the schedule between now and mid January. And they are still -- we are very close to coming to a conclusion on it. In addition -- therefore we would like a little additional time if we could have it.

In addition I believe Mr. Hyslop may require five

minutes beyond that again to meet with his people to prepare -- finalize his cross examination of this panel.

CHAIRMAN: I want to thank you for conveying all that, Mr. MacNutt. We didn't exactly sneak in, you know. Somebody could have stopped us. But we will leave now. And you rattle our chain when you want us back in here.

MR. MORRISON: Well, we sort of concluded that because Mr. Hyslop isn't here, he has waived his right to cross examination. And I'm going to go right to final argument, Mr. Chairman.

CHAIRMAN: All right. We will re-recess. And would somebody come and get us when they want us.

MR. MACNUTT: Thank you very much, Mr. Chairman.

(Recess)

CHAIRMAN: The Board Staff has indicated that there was agreement that the Motions Day had been set on the 1st of December which is a Thursday. And that is at 9:30. Then additional information, if the Board so rules is required, would be filed by Disco on Thursday, December the 8th by noon.

The second set of IRs by the Public Intervenor and the other parties would be delivered on Thursday, December the 15th and would only be related to the questions which had been in dispute. Disco will respond on Thursday, December

22nd.

And then the Board and the parties will be notified if there is a need for a second Motions Day. And the second Motions Day would be on January the 4th which I think is a Wednesday. And again Disco would file additional information on Wednesday, January the 11th.

I understand that counsel wanted to have a drop-dead date for the CARD decision. And I said succinctly that would be the day I drop dead. Now we will do our best. But if people keep bothering us it will be further out into the future.

And the second thing is I understand that Disco has requested a time to be set in reference to hearing the Rogers evidence. And again that is going to be handled sometime in January. We will set that date once we have a better view of where we are going and what the timing will be.

MR. MACNUTT: Mr. Chairman, just revisiting the revised schedule, I think you overlooked mentioning that --

CHAIRMAN: We have trouble hearing you, Mr. MacNutt.

MR. MACNUTT: Revisiting the revised timetable you just provided us, I believe you overlooked identifying the date for notification.

CHAIRMAN: We still are having trouble hearing you,

Mr. MacNutt. Seriously we are. And some of the people in the back of the room are as well.

MR. MACNUTT: Well, I will try and articulate --

CHAIRMAN: There, that is much better.

MR. MACNUTT: -- as best I can, Mr. Chairman.

Revisiting the timetable you have just dealt with, I believe you overlooked the date for the notification of need for second Motions Day, which I believe it was revised from December 13th to be December 29th.

CHAIRMAN: Well, I thought I had covered it, Mr. MacNutt. But if I didn't it has been covered now. Good.

MR. MACNUTT: Thank you, Mr. Chairman.

CHAIRMAN: Anything else? Thank you, Mr. MacNutt.

Mr. Hyslop, go ahead, sir.

MR. HYSLOP: Thank you, Mr. Chair.

CROSS EXAMINATION BY MR. HYSLOP:

Q.36 - Mr. Larlee, I have just a couple of points following up on the cross examination of my friend, Mr. Gorman.

You indicated that the load forecast is an ongoing -- a 10-year load forecast, is that correct?

A. It's -- I think I characterized it as a long-term 10-year load forecast.

Q.37 - Yes. And so the one-year for the immediate requirements of a revenue requirement, it is really just a

subset of the 10-year forecast, correct?

A. That's true. It's one year out of the 10-year forecast.

Q.38 - Sure. And as I understand the purposes for the load forecast, a large part of that relates to the requirements of capacity planning?

A. Yes. There are several reasons why we do a load forecast. And one is capacity planning. And the other is financial planning, which I believe revenue requirement falls into.

Q.39 - Right. And then the revenue requirement would be more the short-term revenue requirement but also keeping an eye on perhaps some long-term capital projects that might need to be undertaken?

A. Yes. I guess -- I think what you are saying is that for the capacity -- on the capacity side of the usefulness of load forecast we would be looking into the long-term. Because capacity additions take so much time to get approved and to get constructed.

Q.40 - Right.

A. It's a longer term undertaking. Whereas on the financial side, normally we are looking at either three-year or five-year business plans and one-year budget. So it's -- you are looking at the front end of the

forecast --

Q.41 - Yes.

A. -- as opposed to the tail end.

Q.42 - So in some sense then the short-term revenue requirements, it is a byproduct of the long-term forecast?

A. I don't think I would put it that way. I basically say that the forecast has many uses. And those are two of them.

Q.43 - Sure. Fair enough. I'm not going to spend a lot of time in the rest of the cross examination on methodology. But I did just want to confirm a couple of points in the evidence. If you might pull up exhibit 16 and in particular Disco PI IR-1. It is exhibit 16.

CHAIRMAN: A-16, and what was the IR?

MR. HYSLOP: Disco PI IR-1, Mr. Chair.

Q.44 - And in that IR, looking specifically at page 3 and the response to question 3, we asked you to outline for us a description of the methodology. And just a couple of points in that answer.

You indicated that the base revenue was developed from the base annual sales from the load forecast multiplied by an annual unit rate. Is that correct, Mr. Larlee?

A. Could you just point me to which paragraph in that

response you are looking at?

Q.45 - Yes. I'm looking at the first paragraph on page 3 under question 3, after the comma, the base revenue forecast is developed on the base annual sales from the load forecast multiplied by an annual unit rate.

A. Yes, I see that.

Q.46 - Yes. And the -- what we are talking essentially then is the load forecast is to determine the volume of sales in terms of megawatt hours or kilowatt hours?

A. That's correct, yes.

Q.47 - Yes. And you apply a rate to that unit rate and I'm not going to get into the unit rate aspects of this. But the point I want to make is it's the volume of megawatt hours or kilowatt hours that we are dealing with and taking from the load forecast, correct?

A. That's correct.

Q.48 - Right. And you do that for the immediate budget year, is that correct?

A. When we are producing the budget, we take it from the appropriate year in the load forecast, that's correct, yes.

Q.49 - Right. And to go a little further with that point, then once you know the number of units -- if your estimates or forecasts of the number of units you are

going to sell was over or under-stated, this would directly impact on revenues, would it not?

A. Just rephrase to make sure I understand what you are saying.

Q.50 - Okay.

A. Are you saying if the forecast is either high or low from actuals it would impact the revenues?

Q.51 - Yes.

A. Yes. Absolutely.

Q.52 - There is a direct correlation between an over or under-statement of the forecast and an over or under-statement of revenues?

A. Again, you know, the forecast can be or will be high or low relative to actuals and as a result that will impact the revenues.

Q.53 - And it also would -- I think there was some point that you made in Mr. Gorman's, but just to clarify it -- it would also directly impact on the variable costs that would be borne as part of the revenue requirement?

A. Yes, that's correct. They are essentially off-setting factors. So if the forecast is low and our actual sales are higher than forecast, our costs will go up, but it would be offset to a certain degree by the fact that the revenues would go up.

Q.54 - Right. Thank you very much. What I want to focus on now is different ways of measuring the accuracy of forecasting, Mr. Larlee.

And what we are trying to determine here is a couple of things, is how accurate has your forecasting been and whether or not there is some type of a pattern to the error.

And I think Mr. Gorman asked you if you ever did reconciliations. Do you as part of your every day analysis of your accuracy forecasts carry out such calculations?

A. Yes, we do. I got a little tripped up on his use of the word reconciliation, but in a sense I would call it variance analysis. So we do do variance analyses between the forecast and actuals.

Q.55 - And I understand there is different techniques that are used to measure the amount of error? For example, there is standard deviation.

A. Yes.

Q.56 - Yes. There is something my colleague, Mr. O'Rourke, called mean squared error? There is a methodology such as that?

A. Yes. You are referring to the statistical type of calculation.

Q.57 - Yes. And there is something called mean absolute deviation. There is different methodologies, correct?

A. Correct.

Q.58 - Right. And are you familiar with one known as mean absolute percentage error?

A. Yes, I am.

Q.59 - And let's talk about the mean absolute percentage error, if we could. I understand that that's an assessment of the size of errors in the context of the size of the original data.

A. That sounds about right.

Q.60 - Right. And the way it's calculated, I understand, is you add up the amount of the error for each period of time and after that's added up you compare that to the actual results, would that be a fair assessment of it, Mr. --

A. Yes.

Q.61 - Perhaps to assist everybody, we have a document that might help. I would ask that it be marked as an exhibit, Mr. Chairman.

CHAIRMAN: My records indicate this would be PI-10.

MR. HYSLOP: Proceed, Mr. Chairman? Thank you.

Q.62 - I will refer you to -- before we get into PI-10, there is another term we are going to talk about and that's statistical bias, Mr. Larlee. You are familiar with that

term?
A. Yes.
Q.63 - Yes. And my understanding that statistical bias is if you are looking for certain patterns of being over or under-estimated with regard to your errors, if there is a consistent pattern, the statisticians refer to that as statistical bias. Am I correct in my understanding?
A. Yes, I believe so.
Q.64 - Okay. So it's just to what extent is a forecast consistently over or under the actual results? Would that be maybe a little simpler way of stating it?
A. Yes, I think that's fair as well.
Q.65 - Sure. And I understand statisticians use something called a tracking signal to determine if statistical bias exists, is that correct?
A. Yes.
Q.66 - And further I understand that statisticians normally, if a tracking is within plus or minus four tracking points, your forecasting is not -- is determined not to have any biases, is that a fair statement as well?
A. Over the period that you are looking at that's -- the plus or minus four is arbitrary in the sense it's like 95 percent. You know, it's one boundary you can use.
Q.67 - Fair enough. Now I want to go on to measure of the

amount of statistical bias. I'm looking at exhibit PI-10. In this example, Mr. Larlee, the first column would indicate that we have had ten or 12 different periods of time?

A. Correct.

Q.68 - And the second column is going to show our actual sales in terms of volume for each of those periods.

A. Yes. But these are not actual numbers. You are showing illustrative numbers, is that correct.

Q.69 - Just for the record, yes. This is a hypothetical because using your actual numbers would -- just the size of the number creates some -- makes it more difficult. I'm trying to do it as simply as I can.

And then the third one is a hypothetical forecast for each of the 12 periods?

A. I see that, yes.

Q.70 - And what I have done and what the statisticians tell me I have done I guess, is I have determined how much my forecast was different from my sales for each period. And that number is put in column 4.

A. Yes, I see that.

Q.71 - Right. So the difference between my actual sales and my forecast sales is 47 less 43 which gives me an error of 4?

A. Correct.

Q.72 - Right. And if it's the other way around, for example as in period 5, my actual sales are 49 but I forecasted 54. My error is minus 5.

A. Right.

Q.73 - Right. So that's the methodology and if I'm wrong at any in the way I'm going through this, please don't hesitate to stop me. Now the next column I understand the statisticians call this Absolute Error and all they have done is remove the minus signs from the minus years. Is that your understanding of absolute error?

A. Right. Yes.

Q.74 - And the next column is the rolling sum of the forecast error. And as I understand the rolling sum of the forecast error, that's just accumulation of the actual error as you go through each of the different time periods. Is that correct?

A. Right.

Q.75 - So for example, in period one the error was 4, and in period 2 the error was 7, so the rolling sum becomes 11.

A. Right.

Q.76 - And in a year where the -- for example, between periods 4 and 5 we started with an error of 19 cumulatively, there was a minus 5, and that brought the rolling sum down to

14.

A. Yes.

Q.77 - Okay. Now the next column is something called mean absolute deviation. And my understanding of how that calculation is made is you take the total amount of the absolute error and divide it by the number of periods. Is that correct?

A. That sounds right.

Q.78 - So to explain it a little further, for example, after one period we had an error of 4 which would be the fifth column over, the absolute error, the one period, so four divided by one gave you four, correct?

A. Correct.

Q.79 - And the next period we had an absolute error of 7, so 4 plus 7 would be 11, divided by two and you have got a mean absolute deviation of 5.5.

A. Right.

Q.80 - Right. Okay. And finally and but not least is the tracking signal -- and by the way, this mean absolute deviation, that can be for one period or you could do it for as many periods as you wanted just by adding and comparing it to the total actual sales, is that correct, Mr. Larlee? It gives you the mean absolute percentage of error, I believe is the --

A. No.

Q.81 - No. I will come back to that.

A. Yes.

Q.82 - And the tracking signal is the calculation between the rolling sum of forecast error divided by the mean absolute deviation. So for example, for the first period you have four divided by four and you get one?

A. Yes, I see that.

Q.83 - Yes. And where you have the total error for two periods being 11, you divide that by the 5.5 and you get two.

A. Right.

Q.84 - Right. So this is very simple, 12 periods in relatively simple numbers, but in theory this could be applied if we knew the actual results and the forecast results from NB Power's forecast for any period of time, correct?

A. Yes. You are basically looking backwards and I think what you are trying to do here is trying to assess any tending in the difference between actual and forecast.

Q.85 - Right. And if I refer you to the graph, what I have done is plotted the tracking signals against each of the periods?

A. Yes.

Q.86 - And this particular one -- and you will note that there is calculations for the tracking signal from zero going up 2, 4, 6, and going down minus 2 and minus 4 and minus 6, et cetera. Those are the tracking signals on the left-hand column?

A. Yes.

Q.87 - And we have plotted the actual tracking signal at the end of each period against the tracking signals in the left-hand column, and we have a graph in this case that stays between plus 4 and minus 4?

A. Right.

Q.88 - I cherry picked my graph a little.

A. Well they are your illustrations, so you get to choose.

Q.89 - And this would illustrate -- statisticians I understand would say that this particular graph would show that the methodology for forecasting does not appear to have any bias -- statistical bias associated with it?

A. That's right. By sort of keeping it symmetrical around zero, it's indicating that the errors are random or have some sense of randomness to them, so they are not trending one way or another.

But I would just like to point out that if we added another period, period 13, and it was a perfect forecast,

in other words it was dead-on, it wouldn't go to zero. It would be a level line. So on a go-forward basis, really in this tracking signal you want a level line. You don't want it jumping around.

Really this is a back cast. You are looking at how has your forecast done. But on a go forward basis you wouldn't necessarily want it to suddenly return to zero. You would want it to stay level.

Q.90 - Eventually maybe gradually back towards the range, I understand?

A. Over a very, very long period of time, but over the time periods we are looking at that's really not practical because of course we are constantly improving our models and so on and so forth.

Q.91 - Sure. I have another exhibit, Mr Chair, I would like to use as an aid in cross examination. Although it looks voluminous and intimidating we won't be going into it too deep.

CHAIRMAN: And that is PI-11.

MR. HYSLOP: Proceed, Mr. Chair?

CHAIRMAN: Go ahead, sir.

MR. MORRISON: Perhaps, Mr. Chairman -- Mr. Hyslop did give us a copy of this earlier. Perhaps he can just explain in general terms what it is so I have a better understanding.

MR. HYSLOP: Okay. Well, I was going to outline a little bit about it. The first five pages of the exhibit -- and if I'm wrong, Mr. Larlee, please jump in -- they are copied from exhibit A-16, PI-2.

And what they represent is the actual revenues for each of the customer classes of NB Power commencing in January of 1993 through to March of 2005. Those are actual monthly results.

So for example, if you were to look at the sales to the residential class in April of 2004/2005 it would be $35,226,000. That is on the very first page. And it is the number in the first row and the second column. So these are actual monthly results.

And I wouldn't spend a lot of time. Because we are not going to -- I assure the Board, I'm not going to go through this month for month by each class. But it is just to show that we do have the actual results.

CHAIRMAN: You would be doing it alone, Mr. Hyslop.

Q.92 - I would probably have everyone asleep. And perhaps just for the record, Mr. Larlee, I will show this to you. And can you confirm that that is in fact the case?

A. I didn't confirm every number. But we did a spot check. And this appears to be right from the response to IRs.

Q.93 - We lifted it right off your --

A. Sure.

Q.94 - -- electronic one. The next two pages in the first section are lifted from exhibit A-16, Disco PI IR-53. And this shows the forecasted revenue budget on a month by month basis going back to I guess April of 1992 through to March of 1995 -- 2005.

So I guess -- and would you agree with that again, Mr. Larlee?

A. Yes.

Q.95 - And if some of the numbers are wrong that certainly is subject to check.

So I guess the question for the witness, after that rather elongated -- we have as part of the written record here actual and forecasted monthly sales results for each of the customer classes, correct?

A. Yes. That's correct. Yes.

Q.96 - Okay. Now what we have done next is done a statistical analysis. And as I understand it, Mr. Larlee, so I could go through these results on a month by month basis and I could determine the amount of error for each month in the statistical forecast, correct?

A. Similar to the way you did in your illustration.

Q.97 - Yes.

A. Yes.

Q.98 - And the amount of error would be -- well, I will get to that in a second. And one of the things we can do by going through the same process as we did in the illustration is we can calculate the tracking signal, is that correct?

A. Yes.

Q.99 - And we can do this on a month to month basis for each of the classes?

A. Correct. Yes.

Q.100 - And as I understand it, there are four large classes, the residential class, the general service class, firm transmission class and the wholesale class, correct?

A. Yes.

Q.101 - Yes. They are the four biggies?

A. Yes. There are others but --

Q.102 - Right. Now the second block down which is following the first blue sheet, that is an analysis similar to what we did in the illustration for the residential class, Mr. Larlee?

A. Correct.

Q.103 - And I believe for the record we have provided this to you at an earlier date and had given you the opportunity to review it?

A. Yes. Again we didn't recalculate all the calculations. But they certainly seem to --

Q.104 - Sure.

A. -- be reasonable.

Q.105 - And your answers are of course subject to check if you find we have made some miscalculation at some point in time. Now the important -- and on the last page of this analysis, which is just before the second blue page, we have created a graph with the tracking signal for the residential class. Do you have that, Mr. Larlee?

A. Yes, I do. I have that.

Q.106 - And would I be correct in looking at the long-term results of this residential class, is that for approximately the first 70 to 76 periods, the tracking was positive in that it was greater than zero?

A. The tracking signal over this period, the first half looks greater than zero, yes.

Q.107 - Right. And this would indicate generally that throughout that period you were underestimating the forecast, correct, compared to actuals, cumulatively over time?

A. Yes.

Q.108 - Okay. And for some of this period in fact we have the

tracking signal above the -- I will use the word magic plus 4 number, is that correct?

A. It is -- it is above plus 4, yes.

Q.109 - Right. And since 1998, cumulatively over time, it would appear that there has been a consistent pattern of overestimating of forecast, correct?

A. No. I wouldn't agree with that.

Q.110 - Cumulatively over time?

A. Cumulatively over this time period the tracking signal hasn't returned to zero. Or it has dove and then it stayed below zero.

Q.111 - And you would agree that it has consistently, since about period 81, which would be sometime in maybe early 1999, it seems to have consistently stayed below minus 4 as well?

A. The tracking signal has. But the error in the forecast, as I indicated, the error in the forecast has been up and down, positive and negative.

And that's why you are seeing towards the end from oh, period 86 or so, you are seeing a relatively flat line, indicating that we are seeing a relatively accurate forecast.

Q.112 - Well, but there seems to consistently be this pattern of overestimation throughout, is that correct, Mr. Larlee?

A. You mean from this period of 86 on?

Q.113 - Yes.

A. Oh, no. I don't -- I think if you look at the numbers they are up and down again. You see, from 86 on you have got something that's in a much narrower bandwidth. I mean, I can't say it's a straight line. But it's a much straighter line than for the entire period.

So really what we are seeing is no statistical bias from that period forward, is the way I would interpret it.

Q.114 - That is the way you would interpret it. But would it not eventually move towards -- back towards zero overall, Mr. Larlee?

Would there not be a tendency through time to have the tracking signal moved back within the plus 4 to minus 4 range?

A. Well, now you are getting into the time period that you have chosen. And I'm going to have to get into what we are actually looking at here. We are looking at actual figures which don't have the impact of weather removed.

So if we look at the chart that you have provided and you look at the period from about 56 to 86, which is the period from about '98 to 2000, we had two warm winters. One of the winters was the warmest on our records.

So warm winter would indicate that our budgets would

have been much higher than actual. And that is what you are seeing. You are seeing this tracking signal dive because of -- entirely because of that extraordinary warm winter.

Just to put some numbers around it -- and you may not understand what degree days are. But basically degree days are a measure of how warm and how cold it is. We might anticipate an extremely warm year, a difference from normal of 200 degree days.

Well, in one of the years in this period, I can't remember exactly which year, we saw a difference of over 500. So completely off the scale essentially of what we would anticipate.

And remember I said when we are looking at normal weather we are looking at a period of 30 years. So I guess if we could look at the tracking signal for 30 years, and all other things being constant, which of course is not practical, we would anticipate or like to think that the forecast would -- and the tracking signal for the forecast -- would tend to zero.

But we are not. We are looking at a very sort of short slice in time. And I think what is important from Disco's point of view to do is -- if we were to do this analysis -- would be to look at the tracking signal and

try to keep it as flat as possible.

Because we want next year's forecast to be as good as possible. We don't want next year's forecast to give us the best possible tracking signal. We want next year's possible to be as good as -- next year's forecast to be as good as possible.

And that means essentially a tracking signal -- it would give us a tracking signal that would give us a straight line on a go-forward basis.

Q.115 - Now again, Mr. Larlee, you say a short period of time. You would agree with me that this tracking signal is a record over 13 years?

A. Yes. And the reason why I use the words, short period of time, is because we are looking at weather normals of 30 years.

Q.116 - Well, that would be at least half of the 30-year period or close to half of the 30-year period, correct?

A. Right. Yes.

Q.117 - Yes. Now just again on that, to normalize over the 30-year period -- but in terms of statistical information, isn't there ways you can modify or take into account the different -- say one fluke year in terms of your statistical analysis and making corrections. And have those corrections been made?

A. Well, what we tend to do is when we look at the actuals versus the forecast, we actually adjust the actuals. So we talk about weather-adjusted actuals.

And that way it gives us a feel of how the forecast is doing on a weather-adjusted basis to try and take, well, weather out of the equation. So that tends to be how we do our assessment of the forecast.

Q.118 - Okay. Let's move on maybe and look at the graph or the next block which I think is the general service. And that would be the last page before the next blue page.

A. Mmmm.

yQ.119 - Do you have that, Mr. Larlee?

A. Not yet.

Q.120 - Okay.

A. To go --

Q.121 - If you look for the next blue page, come back up one, you should have it. And again we have provided -- although we didn't provide the tracking signal for the general services back in August, but you have had a chance I believe this morning to look at the methodology and the calculations that we have done that support this graph?

A. I haven't had a chance to go through it in any detail, but I mean, I will take it --

Q.122 - Subject to check?

A. -- subject to check, sure.

Q.123 - And subject to check, the tracking signal for the general service forecast is again represented as part of exhibit P-11, correct?

A. Yes.

Q.124 - Yes. And if we look at this particular tracking signal, it would appear that perhaps for approximately 56 to 61 months, the tracking signal stayed relatively within the plus or minus 40, correct -- plus or minus 4?

A. Yes.

Q.125 - Yes. And then it would appear that starting sometime around early 1998, the tracking signal has fallen a long way until it was 25 -- over-estimated to the point of 25 tracking signal points, which would be the low point of the graph?

A. Yes. Again, what we are seeing here is is the impact of extremely warm winters.

Q.126 - Oh, extremely --

A. Now it's not as -- because general service doesn't have as much electric heat as residential, it's not as dramatic here. But we do have the general service II class included here, which has a high penetration or a hundred percent penetration of electric heat.

Q.127 - Sure. Now if you go from approximately 60 to 106,

that would be the better part, according to my math of about 46 months. So you are saying warm winters resulted in this spiral over a 46-month period?

A. It would be the primary driver, what you are seeing here, yes.

Q.128 - For that whole period, even though there are summers and other seasons involved in that?

A. Well, again remember what you have to look at in this graph is not so much of the relationship to zero, it's the up and down motion of it as it moves up and down. So although the tendency is down, there are months where it's going up. So the error is not always in one direction.

Q.129 - You indicated the general tendency is down?

A. That's right.

Q.130 - But shouldn't the general tendency to be to try to get back between plus and minus 4, in the absence of statistical bias?

A. Without the extremes in weather that we have seen in the period, I would agree with you, yes. But the fact is we have seen those extremely warm winters.

Q.131 - Right. Perhaps we could move on to the next blue page and come back one and look at the wholesale forecast error tracking signal? Do you have that, Mr. Larlee?

A. Yes, I do.

Q.132 - And again it would appear that starting approximately at period 31, we have had a general tendency until the last couple of years at least to have a consistent downhill spiral occur over time?

A. Yes, the tracking signal is tending down, yes.

Q.133 - Yes. And comes back a little at the end, is that correct?

A. Yes.

Q.134 - And just for the record, it would appear that there were as many as 60 tracking signal points away from zero in terms of over-estimation for the wholesale forecast error tracking signal?

A. That's what the graph is saying, yes.

Q.135 - Right. And subject to check on your part?

A. Yes. Again, I mean I reiterate the point that much of this is going to be related to weather. And in the later part of the period, the line is much more level.

Q.136 - Yes.

A. And that's what we should be shooting for is a level line.

Q.137 - I understand that. Yes. Now the last page -- we don't have to look hard for this one, the very last page of exhibit P-11 -- PI-11 --

A. Right.

Q.138 - -- is the firm transmission forecast error for the tracking signal?

A. Right.

Q.139 - And it would appear that on terms of firm transmission, we have almost always been over-estimating that, is that correct?

A. Well again, I think if you look at the numbers, there will be some months where the forecast is low.

Q.140 - But the general trend --

A. You can't say they were always over-estimated.

Q.141 - Yes.

A. What you are showing here is a trend over a -- sort of a rolling period.

Q.142 - A cumulative trend?

A. That's right.

Q.143 - Right.

A. And that's -- now I think everyone is aware that in the transmission sector it's not sensitive to weather. So I think I probably, if you don't mind, I would like to explain what is going on.

Q.144 - Well, you are probably going to tell me about the increase in surplus sales?

A. No. What I am going to -- I am going to try and explain is the nature of the large industrial forecast.

And when we do the large industrial forecast -- the industrial transmission forecast, excuse me -- we are essentially looking a year ahead. And when we look a year ahead, we do it on a customer-by-customer basis.

And we essentially ask our customers what is going on, what are you planning, what load additions are you planning, so on and so forth? And when it comes to load additions, customers usually have a very good idea about what they are planning for load additions well in advance, at least a year in advance so that we have time to include it in our forecast. So we tend to be quite good at capturing the load additions.

Unfortunately, customers don't tend to know or aren't willing to share with us, for whatever reason, shutdowns or partial shutdowns. So our forecast tends to be very good at capping where it's likely to be under a business as usual situation.

But if something goes wrong during the year with a customer, for whatever reason, whether it's a labour dispute, whether it's problems with their markets or general problems with the economy or what have you, we don't know that in advance. So the forecast then is going to tend to be high, because the shutdown or partial shutdown is going to reduce our sales.

So I guess it's the nature of the forecast that it is much more likely to be high, because we are -- not that we are forecasting a lot of growth or a lot of new load, it is that we are forecasting business as usual, because that's what -- we are assuming our customers are telling us that.

And then as we get closer to the period, there is these surprise -- surprise situations that tend to only work in only one direction and that's down -- downward.

Q.145 - And again that's an explanation as to why you over-estimated, but cumulatively through time, it would appear to me that in this sector as well, you have over-estimated in terms of the forecast versus actual sales. Is that correct, Mr. Larlee?

A. Well, I think what I am trying to explain is that really the nature of the forecast that we are using? Again, what we strive for on a go forward basis is to try and keep this line as level as possible and over the -- you know, the last --

Q.146 - Sure.

A. -- few periods, 20 or 30 periods, we have done -- we have done pretty well.

Q.147 - And again, even though there may be one or two over time cumulatively you have over-estimated in the firm

transmission class, correct?

A. Over the period you are looking at.

Q.148 - Yes. Thank you. Just speaking generally in reference to all the classes, Mr. Larlee, when I look at these four graphs, perhaps I should have tried to put them altogether. But again speaking generally can we summarize and say that from the period 1993 through to about early 1999 on a cumulative basis the utility consistently appeared to have under-forecast revenues from all of its classes, would I be correct in that?

A. On a cumulative basis that we have under-forecast revenues over the period? I would have to take -- can you give me two minutes?

Q.149 - Sure.

A. Yes. That's what your numbers are showing.

Q.150 - Sure. And again would you agree with me that cumulatively looking at everything say from some time '98, '99 to the present, it would appear that on a cumulative basis the utility has consistently over-forecast the revenues for all its classes?

A. No, I wouldn't agree with that. Again, that comes to the idea that really you are looking at the slope of your tracking signal line, and I try to point out that the

slope is relatively flat from that period on, from 2000 on.

So I think probably on a cumulative basis we would find that the forecast isn't trending one way or the other.

Q.151 - Well would you agree with me that the tracking signal values would be values that would show that there seems to be -- they are generally outside the plus or minus four tracking signal range, or they would be consistently below the minus 4 tracking signal range?

A. Yes. It's outside there.

Q.152 - Thank you.

A. I agree. There are some reasons for that.

Q.153 - So I guess my question is and where I tried to lead with all this is that in consideration of your load forecast for 2006/2007, you know, why should we accept that you have developed a revenue forecast for any of the classes in each of the test years for this application that's free of bias, free of statistical bias?

A. Well what we are looking at in that tracking signal is basically a particular slice in time, and in that slice in time, again as I pointed out, we had some very -- some very unusual weather.

According to the 30 year normals in weather we could

conceivably have some very unusual weather that is colder. And indeed, we have had some very cold spells in the last couple of years.

I think it might be useful for the Board to turn up the response to an IR that basically shows on a gigawatt hour basis the difference between our forecast and the actuals. It's PUB IR-114. It's August 5th. I don't have the exhibit number. Maybe Mr. Morrison can give us the exhibit number.

MR. MORRISON: Exhibit A-12.

A. Thank you. It's exhibit A-12. It's Disco PUB IR-114. It's the August 5th responses.

MR. MORRISON: I believe that's A-17, Mr. Chairman. I apologize for that.

A. 114, yes. PUB IR-114. The response to this IR -- I think everyone has it -- it's basically to reproduce a graph that's in the load forecast but to do it on an energy basis. So that's what is done in this forecast -- in this response. And what it's doing is it's comparing the actual, which are the numbers, and the solid line to the forecast from ten years out and one year out.

So for the purposes of this hearing, we would be looking at the lightly shaded bar as the forecast and then the lie on the numbers. So I think everyone would agree

that on an aggregate basis for the total requirements that Disco is looking at, the forecast has come in quite close to actual.

Q.154 - Well I thank you for that. I think the graph speaks for itself. But for example, in the year 2000/2001, if I'm reading your graph you are saying that you would have had an actual of 14,943 gigawatts, Mr. Larlee?

A. Yes.

Q.155 - Yes. And I can't exactly take the bar line up but it appears to be somewhere in the area of a forecast of 17,000, pretty near 18' -- 17,500 gigawatts.

A. That was the ten year old forecast. It was ten years out.

Q.156 - The white line is the one that's --

A. That's right.

Q.157 - -- the one year?

A. Yes.

Q.158 - Okay. I understand. But I want to just go back a little. This is a total system calculation for your energy forecasted for the entire system and the actual --

A. That's right.

Q.159 - -- in terms of gigawatt hours?

A. Correct.

Q.160 - But isn't the purpose of a revenue forecast to

determine the revenue requirements on a class by class basis?
A. Yes, that's what the revenue forecast is.
Q.161 - Yes. Okay. So on a class by class basis I put it to you that the graphs illustrated in exhibit PI IR-11 may be more illustrative of biases on a class by class basis, notwithstanding that on a system basis your numbers may or may not be as close to as projected?
A. I can't agree that there is statistical bias simply because of the fact that we had the extreme weather years within that analysis.
Q.162 - Okay. Well let's put it this way. In terms of your system requirements, we will take them from this graph -- but you would agree with me that the forecasting on a class by class basis does not appear to be quite as accurate as we have on the system as a whole, is that correct?
A. Yes, that's correct. I mean, that's just simply the nature of the beast. The finer you slice it, the more variability you are going to get. You are going to have offsetting factors as you build up.
Q.163 - Right. And again just to repeat, your revenues are determined on a class by class basis for purpose of the revenue forecast?

A. That's right. They are done on a class by class basis and then added up for the total revenue.

Q.164 - Sure. And it's these revenues on a class by class basis that go to determining part of the inputs and what the rates should be on a class by class basis?

A. That's correct. The revenues are added up and that determines what revenues we would get under existing rates.

Q.165 - Sure.

A. Sales -- the sales are added up and losses are added to them and that is used to basically determine what Disco's supply requirements will be, and those two factors play into what the rate increase requirement is going to be.

Q.166 - And again just to maybe cover a point I may have touched on before, the class by class basis of the allocation of the variable costs is one of the offsetting factors when you do the revenues on a class by class basis, correct?

A. You lost me there.

Q.167 - I'm just saying that the load forecasting on a class by class basis also goes to calculating the variable costs that are allocated to that class?

A. You are talking cost allocation now, are you?

Q.168 - Yes. Well I am saying allocation, the costs that are incurred by that class. In other words the variable costs per megawatt hour that go to the residential class, they are determined on the basis of the forecast you do for the -- or the forecasted number of megawatt hours you anticipate the residential class uses?

A. Yes, that's right. The cost allocation study for '05/ '06, the one reviewed in the CARD hearing, used the numbers from the load forecast for the residential class.

MR. HYSLOP: Okay. Thanks very much, Mr. Chairman.

CHAIRMAN: Thank you, Mr. Hyslop. I'm not going to have the door open because I think it's probably a good time to take our noon hour break and come back at quarter-after-one.

MR. MACNUTT: Mr. Chairman, I think the only cross examination left is mine.

CHAIRMAN: Sorry, Mr. MacNutt. We can't hear you, sir.

MR. MACNUTT: I think the only cross examination left is mine and it will only be about ten minutes.

CHAIRMAN: We are going to have a full stomach when we hear your cross, Mr. MacNutt.

MR. MACNUTT: Mr. Chairman, perhaps before the break -- because when I do cross examine, I will wish to refer to one of the exhibits that you marked during the break -- I

wonder if you could provide us with the description of each volume marked with the exhibit number for purposes of the record.

CHAIRMAN: Thank you for reminding me, Mr. MacNutt. A-54 is dated November 14th, responses to interrogatories. It's volume 1 of 1. A-55 are the appendices to the responses to the IRs. A-56 are the responses to deferred IRs dated November 10, 2005. A-57 is volume 1 of 2 of the appendices to deferred responses. And A-58 is volume 2 of appendices to deferred responses. Okay. All right. We will break.

(Recess - 11:45 a.m. - 1:15 p.m.)

CHAIRMAN: Good afternoon, ladies and gentlemen. Anything preliminary? Go ahead when you are ready, Mr. MacNutt.

MR. MACNUTT: Thank you, Mr. Chairman.

CROSS EXAMINATION BY MR. MACNUTT:

MR. MACNUTT: The two documents we are going to look at is the load forecast 2005-2015, May 2005 which is exhibit A-6. And the second document I would ask you to turn up is Disco PUB IR-211, Responses to Interrogatories, number 1, Revenue Requirement, Volume 1 of 1, November 14th 2005. I think that was marked as exhibit A-54, PUB IR-211.

CHAIRMAN: Yes. Mr. MacNutt, the panel doesn't have those, I don't believe.

MR. MACNUTT: It is not really necessary for the panel to have it, Mr. Chairman. Because the document I'm going to actually ask the witness to address is in the response which is exhibit Disco IR-211.

CHAIRMAN: So it is IR-211.

MR. MACNUTT: Yes. That is the four. Even in that circumstance it is perhaps not necessary, Mr. Chairman. Because I'm going to be asking the witness to compare two numbers in a particular table. And I will be giving those numbers. Thank you.

Q.169 - Now Disco's load forecast 2005-2015 was filed with the Board and marked as exhibit A-6 on May 30th 2005. Disco PUB IR-211 of November 14th 2005 requested Disco to update tables 1 to 8 of the load forecast by inserting the actual figures for 2004/2005 and the forecast for 2005/2006 and to provide the revised forecast for 2005/2006.

Disco responded by providing the revised tables in its response to PUB -- Disco PUB IR-211. I have a number of questions with respect to one of those tables.

I would ask you to turn to Disco PUB IR 211 which is page 7 of the response where the table 6 appears. And it replaces table 6 at page 23 of exhibit A-6.

Do you have table 6?

A. Yes. I have table 6.

Q.170 - Thank you. Now I would like you to go to column 3.

CHAIRMAN: Mr. MacNutt, is that what you are going to hand out to us?

MR. MACNUTT: I don't think you need it, Mr. Chairman.

CHAIRMAN: Okay.

Q.171 - I'm going to ask the witness to go to column 3 headed "Total Transmission Sales in Gigawatt Hours." The actual gigawatt hours for transmission sales for 2004/2005 are 5,181 gigawatt hours, correct?

A. Yes. That's correct.

Q.172 - And the current forecast for transmission sales for 2005/2006 is 4,865 gigawatt hours, is that correct?

A. Yes.

Q.173 - The forecast for transmission sales for 2006/2007 rise to 5,444 gigawatt hours which is an increase of 579 gigawatt hours over the 2005/2006 forecast or an 11.9 percent increase, is that correct?

A. Yes. That sounds -- that sounds about right.

Q.174 - Please explain this sharp one-year, year over year increase in transmission sales forecast for 2006/2007?

A. The number you are looking at contains both transmission sales -- it contains the total transmission sales. Yes, that's right, okay. My mistake. I thought it contained distribution. But it is just transmission.

If you just flip the page -- does the Board have the table we are looking at?

MR. DUMONT: Yes.

WITNESS: Okay. If you flip the page to page 8, that breaks out the transmission sales in a little bit more detail. It might be useful if we looked at table 7 on page 8.

And then you can see here, if we just look at firm sales -- nonfirm sales which are interruptible and surplus sales, we are not forecasting any change. So it's the change in firm sales that we are really looking at.

And there is really two overriding factors that are causing that rise in firm sales. And that is the return of the UPM-Kymmene operations as the result of a labour disruption. That should be back for a full year.

And the recent announcement, St. Anne-Nackawic, we have St. Anne-Nackawic in the forecast. So that will be back. And that will result in increased sales.

Q.175 - Thank you. Now the forecast for 2005/2006 in exhibit A-6 was 5,342 gigawatt hours. The current outlook for 2005/2006 is 4,865 gigawatt hours. That is a reduction of 477 gigawatt hours.

Will this drop in sales provide a decrease in the cost to Disco for the purchased power?

A. I'm sorry. I wasn't -- I wasn't able to follow the

numbers 100 percent. Can you repeat the question?

Q.176 - Forecast for 2005/2006 was 5,342. Still looking at table 6. Oh, I'm sorry. I have confused you and myself a bit here.

Yes. I want you to actually go to A-6, not the replacement table in response to Disco PUB IR-211.

A. Okay.

Q.177 - And keep the response to Disco PUB IR-211 available. So the original forecast for 2005/2006 in exhibit A-6 was 5,342 gigawatt hours, is that correct?

A. Correct.

Q.178 - Now the current outlook, coming to the revised table 6, which is in Disco PUB IR-211, exhibit A-54, is 4,865 gigawatt hours. Do you have that?

A. Yes.

Q.179 - And that is a reduction of 477 gigawatt hours, is that correct, subject to check?

A. That looks about right, yes.

Q.180 - Now will this drop in sales provide a decrease in the cost to Disco for purchased power?

A. For '05/'06?

Q.181 - Yes.

A. Yes. Decrease, decrease. It will reduce Disco's requirements. And therefore it will reduce Disco's costs.

Q.182 - Would you walk us through what actually happens?

A. Well, Disco is billed on a monthly basis for the energy that it consumes from -- or as a result of all its power purchase agreements.

So if that -- if the energy requirement goes down then Disco will pay less on the energy portion of that bill.

Q.183 - Is there any impact on the capacity portion of the PPA?

A. No. Disco -- the way the PPA is structured, and my understanding of the way the PPA is structured, is that the capacity payments are essentially fixed. Because Disco has contracted for all of the capacity that Genco has, essentially. So that payment is fixed.

MR. MACNUTT: Thank you, Mr. Chairman. No further questions.

CHAIRMAN: Thank you, Mr. MacNutt. You might as well just stay right there. The Board panel will have a few questions.

MR. MORRISON: Mr. Chairman, I do have a couple of questions on redirect.

CHAIRMAN: Well, I suggest you wait until we get through with what the panel may have.

MR. MORRISON: Okay. Fine, sir.

BY THE BOARD:

DR. SOLLOWS: Thank you, Mr. Chairman. Mr. Larlee, I would like to direct your attention to this table that you handed out earlier this morning labelled "Disco load forecast models".

A. Yes, I have that.

DR. SOLLOWS: I look at the main inputs and I see population is one of them, New Brunswick GDP is another and goods producing GDP is a third. And I know you said at one point this morning that you do everything except Perth-Andover. So my question is how do you back Perth-Andover's population GDP and such out of your analysis in order to take it out of the model?

A. Subject to check, I don't believe we do. We just assume that the impact of Perth-Andover would be so small as to not affect the forecast.

DR. SOLLOWS: Okay. Thank you. I would like to now go to A-6 which is your load forecast, table 11 on page 33.

A. Okay.

DR. SOLLOWS: My question is you have -- the first part of the table is actual, then there is an outlook and then there is the forecast. And I see from the -- where -- with the information we have just looked at -- you have updated this in the response to interrogatories. But my

question is the data that is listed as actual, is that weather normalized or weather adjusted?

A. No, it's not.

DR. SOLLOWS: Okay. Do you have the weather adjusted data that is equivalent to this somewhere in the evidence package?

A. I don't believe we do, but --

DR. SOLLOWS: Is it available?

A. It is available, yes.

DR. SOLLOWS: Could you provide it in tabular and graphical form?

A. I don't see why not. Yes, we could.

DR. SOLLOWS: That would be great, along with the normalization factor you were using in each year, if you could.

A. So the amount of the weather adjustments?

DR. SOLLOWS: Yes.

A. Okay. Yes.

DR. SOLLOWS: That's great. Now when I look at this in terms of the total volume of energy on the distribution system, I take what is under column residential, general service, streetlights, industrial distribution and distribution losses, and I have got a total of about 8,559 gigawatt hours. Would you say -- is that right? That's

the sum of those five for the year that we are talking about here, 2006/2007? Is that about right?

A. Yes. That would give Disco's distribution requirement -- service distribution customer.

DR. SOLLOWS: What kind of power factor do you expect on that portion of your load?

A. You are referring to power factor, not load factor.

DR. SOLLOWS: Yes.

A. You are referring to power factor. I don't have any really good information right off the top of my head on what the power factor would be.

DR. SOLLOWS: Somewhere -- something above 90 percent, one would imagine?

A. One would -- yes, it would be somewhere above 90 percent because of -- and largely that's driven by the fact that there is so much electric heat in the system, and the power factor in electric heat of course is one.

So any offsetting type of technology that would tend to give us a poor power factor, like fluorescent lighting or electronic supplies to computers and so on and so forth, wouldn't drag down a power factor that much.

DR. SOLLOWS: Okay. Thank you. Then when I look at that energy forecast and recognize that there are 8,760 hours in a year, I divide the two and I get a number of about a

thousand megavolt amps is what that energy forecast represents.

Is that -- am I doing the math right?

A. You are calculating the average --

DR. SOLLOWS: An average load.

A. An average. That's right. That would be right, yes.

DR. SOLLOWS: What capacity factor do you expect from your distribution plant to service that average load, and I'm thinking particularly the transformers?

A. So what the load factor would be?

DR. SOLLOWS: The capacity factor on the transformers?

A. That's difficult for me to say because -- because we are a winter peaking utility, transformers can be driven quite hard in the winter time because the temperatures are so low. Transformers are usually rated at different temperature levels and the lowest temperature level that you may have a name plate rating for would be a zero degree C. Well when we peak we go much lower than that. So they can actually drive these transformers quite hard. So I can't give you a number.

DR. SOLLOWS: Did we not have some data in the previous hearing about the total amount of capacity -- name plate capacity of transformers that was installed?

A. Yes, we would have that.

DR. SOLLOWS: Would that not represent the capacity that has been installed?

A. That would represent the installed name plate capacity, that's right.

DR. SOLLOWS: So if I divided that into this thousand megavolt amps, that would be the capacity factor.

A. That would give it to you based on name plate, yes, it would.

DR. SOLLOWS: Can you provide that?

A. Certainly.

DR. SOLLOWS: Thank you. Now my last question arises out of the Public Intervenor's examination this morning. You indicated that weather extremes were the cause of the deviations in those plots that he provided, is that right, largely?

A. Yes.

DR. SOLLOWS: Have you filed the analysis to support the opinion?

A. No, we haven't. We just came to that conclusion by looking at the timeframe involved and knowing when the extreme weather occurred. And basically it follows through that we would have a much more compressed looking line if we had weather adjusted -- if we used weather adjusted data.

DR. SOLLOWS: Would it be a big burden to provide the weather adjusted data and that analysis that we could see the curves that are correct in your view?

A. Probably something we could do or turn around within a couple of days, three days.

DR. SOLLOWS: Thanks very much. That's all.

CHAIRMAN: Thank you, Mr. Sollows. Mr. Larlee, as I understand it if you estimate low for the test year and we set the rates to recover your cost and a margin on the basis of that low projection of consumption, and you actually do better than that, that means you are going to earn more income than is necessary, is that not correct?

A. I think generally, yes, but it could depend on -- it could depend on where we are off in the forecasting, in other words, which sector. But generally, yes.

CHAIRMAN: Okay. I guess it's on the premise that each sector will cover its costs and presumably at the end of this hearing it will, and then contribute to a return.

A. That's right. With for instance, general service contributing more because it's a distribution class than industrial transmission which isn't -- Disco doesn't have any distribution assets. So it would be less of a return from that class. But yes, generally speaking.

CHAIRMAN: Thank you. Mr. Morrison?

MR. MORRISON: Yes. Thank you, Mr. Chairman, Just a couple of questions actually and it comes out of Mr. Hyslop's cross examination this morning.

REDIRECT EXAMINATION BY MR. MORRISON:

Q.184 - I would ask you to turn up exhibit PI-11 which was the document that he handed out this morning. And if you could turn to the second blue page and then go one back, which is the residential forecast error tracking signal. Now this morning, Mr. Larlee, Mr. Hyslop suggested that your goals should be to have that tracking signal return to zero. I believe that is what he suggested. What if anything do you have to say about that?

A. Well, Disco shouldn't really have that as its goal. It should have as its goal to get the most accurate forecast as possible, which would tend to basically keep that portion of the graph flat and continue along flat. To actually try to get back to zero, essentially would require creating a model that would compensate for variances that happened in the past. So essentially we would be introducing a bias to correct for something that happened in the past.

Q.185 - Thank you, Mr. Larlee. And I am not sure if the undertaking you just gave to Mr. Sollows will include this, but there was some discussion this morning both in

your answers to Mr. Hyslop and some comments from Commissioner Sollows about weather-adjusted data. And if you look at this tracking signal, would the tracking signal be different than is what is shown here if you were to use weather-adjusted data?

A. Yes, it would and the undertaking will address this. But I believe it will flatten that chart dramatically.

Q.186 - And is there any reason why Disco have -- or your group hasn't done a tracking signal analysis such as what was prepared and presented by Mr. Hyslop?

A. Yes. And again it comes to this idea that Disco is trying to create a forecast that is as close to what actual is going to be as possible. Whereas this tracking signal analysis, my take on it really is a measure of how well a forecast is dealing with the randomness, the inherent randomness is any forecast. And that's really not our concern. Our concern is how well we can make the next forecast.

MR. MORRISON: Those are all my questions, Mr. Chairman. Thank you.

CHAIRMAN: Good. Thanks, Mr. Morrison. Do you want to break before summation?

MR. MORRISON: Sure. Let's take 15 minutes.

(Recess - 1:45 p.m. to 2:00 p.m.)

CHAIRMAN: Go ahead, Mr. Morrison.

MR. MORRISON: Thank you, Mr. Chairman, Commissioners. I will be brief.

The one thing I can say about this forecast is that it will be wrong, because all forecasts are wrong. And that's the only think you can say with certainty about them. However, as indicated in Mr. Larlee's evidence, as you go further out in time, the chances of their being a variance between forecast and actual becomes greater. But what we are dealing with here is a one-year load forecast, which is for next year essentially. So one would logically suspect that the variance between actual and forecast should be significantly less than if you were looking at 10 years out.

The forecast was prepared using the Board-approved methodology. And as Mr. Larlee indicated this morning, the Board's ruling at the Lepreau Load Forecast Review, Generic Hearing, update I guess, the Board did suggest certain changes. Those have been incorporated into the methodology, particularly with respect to price elasticity.

There is no Intervenor evidence filed. So there is no evidence really before you that really impugns the load forecast that has been submitted.

There is also no evidence before you that would suggest that the load forecast for '06-'07 is either too high or too low. And Disco believes that it is neither too high, nor too low. And in fact it probably has as a good chance of being too high, as it does of being too low.

So there is no bias in terms of the forecast itself. And therefore with respect the revenue requirement, there is no bias with respect to either the revenue requirement or the rate increase that will be needed in order to meet that revenue requirement.

So in short, and like all Canadians, we like to blame it on something, but if there is a variance, significant variance between the forecast and the actuals next year, it's going to be weather-driven. There may be some impact from -- if there is an industrial closer, but basically it is at the whim of the weather. If the weather is within normal parameters, then the forecast will be more accurate. If we have an unusual winter, either in terms of warmth or coldness, then you can anticipate that the forecast will be off.

So those are all the submissions I have to make, Mr. Chairman.

CHAIRMAN: Thank you, Mr. Morrison. Mr. Gorman?

MR. GORMAN: Thank you, Mr. Chairman. The Municipal Utilities have no submission to make to the Board in connection with the one-year load forecast for 2006-2007.

CHAIRMAN: Thank you very much, Mr. Gorman. Mr. Hyslop?

MR. HYSLOP: I will be very short, Mr. Chairman. The issue is the accuracy of the one-year load forecast. And we do note that load forecasts have many different purposes, many of which are long-term in nature. Particularly, planning for generation transmission capacity and also for the purpose of PROMOD inputting.

So we are dealing with a subset, whether it's a by-product or not, maybe is a little aggressive. But I think that's to be kept in mind.

Our point is that methodologically there may be other ways and approaches. And keep in mind that the real issue here is the revenue forecast. But as I understand it, if there is better methodology, that's something that's for another day.

We are of the view that since 1998, and we provided the information quite early so that Disco would have the opportunity to at least confirm the accuracy of our calculations, which they have, but it is our suggestion that there is a cumulative pattern of over-estimation for each of the rate class. And it is the rate classes that

are important. And I am not quite sure where that will leave us, but by the end of the day the explanation seems to be warm winters or industrials providing bad information related to closings.

I make as an observation and nothing more than that that maybe the thought of using a 30-year, the weather normalization should be re-thought. A normalization is a way of explaining why you were wrong. And what we really want to know is if we can or are able to do it better.

One of the points that came out is not only is there a load forecast, but if I was going to establish the credibility of my load forecast, I think I would be the one that would be putting before the Board some statistical analysis as to the level and quality of the forecast itself in terms of its past accuracy. Yes, we may be looking to the future, but have you been right in the past? And whether or not it's the Public Intervenor that should be coming in with common accepted statistical methods that show certain thing about the accuracy of the past, my suggestion would be that part of any Order this Board would make that the annual forecast when filed should be supported at least by some statistical measure as to how accurate or inaccurate they were the year before. I think this would be useful information for the

Board as part of its usual and ongoing regulatory process.

So at the end of the day, those are our comments. It's in the discretion of the Board whether or not it accepts this and whether or not it might want to accept it with some reservations, perhaps to have some review of long-term climate plans and climate change and maybe some suggestion as having the annual load forecast when prepared by Disco filed with the Board with some statistical information about the prior year's accuracy. Thank you.

CHAIRMAN: Thank you, Mr. Hyslop. Mr. Morrison?

MR. MORRISON: Nothing further.

CHAIRMAN: As we all understand, that concludes the portion of the hearing dealing with the test year load forecast. And that once things are wrapped up in reference to the Rate Hearing itself, we will reconvene to look at the 10-year forecast.

MR. MORRISON: That's our understanding, Mr. Chairman.

CHAIRMAN: Good. Well, thank you very much. And61 we will reserve our ruling -- it has to be a ruling, rather than a decision I guess -- to be given at a future date that I won't be nailed down on. Thank you.

(Adjourned)

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