New Brunswick Board of Commissioners of Public Utilities

In the Hearing of an application by NBP Distribution and Customer Service Corporation (DISCO) for changes to its Charges, Rates and Tolls - LOAD FORECAST

Trade and Convention Centre, Saint John, N.B.
November 27th 2006

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Undertakings

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CHAIRMAN:	David S. Nelson
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BOARD STAFF:	Doug Goss
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ASSISTANT SECRETARY	Juliette Savoie

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CHAIRMAN: Good morning. It seems like -- I don't know. It seems like an eternity ago that we were all together. And I guess we are back again here.

In the matter of an application by the New Brunswick Power Distribution and Customer Service Corporation for changes to its charges, rates and tolls, the Load Forecast portion of the hearing.

Could I have appearances please for the Applicant?

MR. MORRISON: Good morning, Mr. Chair and Commissioners. Terry Morrison for the Applicant. And with me at counsel table is Lori Clark, Director of Regulatory Affairs for DISCO, Mike Gorman, Vice-president Legal. And our witness who will be joining the panel, Neil Larlee, which you are all familiar with.

Canadian Manufacturers and Exporters?

MR. PLANTE: Dave Plante appearing on behalf of CME.

CHAIRMAN: I notice Mr. Coon is there for the Conservation Council.

MR. COON: Good morning, Mr. Chairman. Along with me -- David Coon. Along with me is Toby Couture for the Conservation Council.

CHAIRMAN: J. D. Irving Limited? New Brunswick System Operator?

MR. ROHERTY: Good morning, Mr. Chairman and Commissioners. Kevin Roherty for New Brunswick System Operator. Along with me today are Margaret Tracy, Norman Seely and Ian MacPherson.

CHAIRMAN: Vibrant Communities Saint John? Mr. Peacock is not here as yet. Mr. Hyslop?

MR. HYSLOP: I know he intends to be present. So he will probably be along, I expect.

CHAIRMAN: Okay. We will recognize him when he comes in.

Public Intervenor?

MR. HYSLOP: Yes, Mr. Chair. Peter Hyslop with Robert O'Rourke and Carol Ann Power.

CHAIRMAN: Informal Intervenors? New Brunswick Power Generation Corporation? Municipal Utilities?

MR. YOUNG: Good morning, Mr. Chairman and Commissioners. On behalf of the Municipal Utilities, Dana Young. And with me I have Marta Kelly, VP Finance and Administration for Saint John Energy.

CHAIRMAN: Thank you. Board Staff?

MS. DESMOND: Ellen Desmond, Mr. Chairman. And with me is John Lawton and Doug Goss.

CHAIRMAN: Have I overlooked anybody in the process here? Is there any preliminary matters?

MR. MORRISON: Not for the Applicant, Mr. Chairman.

CHAIRMAN: Does anybody else have any preliminary matters they want to deal with? Mr. Hyslop?

MR. HYSLOP: I was wondering, Mr. Chair, about the perhaps marking of the exhibits, whether you want to do it at this time?

CHAIRMAN: That is what I was -- I was going to move into that next.

MR. HYSLOP: Thank you.

CHAIRMAN: Can we have the marking of exhibits please.

Mr. Hyslop, do you --

MR. HYSLOP: Yes, I do. I wasn't sure where we were at. Mr. Chair, yes, we have filed with the Board and have provided copies electronically to the Intervenors of two documents which we would ask be made part of the record. The first is the pre-filed evidence of the Public Intervenor. And then there were some interrogatories which we received. And the responses to those IRs were also filed with the Board and electronically with each of the different parties to this proceeding.

We would ask that both those documents be marked as exhibits.

CHAIRMAN: The rebuttal testimony of Wayne P. Olson and Amparo Nieto, that would be PI-1.

MR. HYSLOP: And the second is the responses to interrogatories which we received. We filed those responses with the Board, Mr. Chair.

CHAIRMAN: That will be marked as PI-2. Ms. Desmond, do you have --

MS. DESMOND: Yes. Thank you, Mr. Chair. The Staff has filed documents which we would ask be marked as exhibits. The first is the evidence of Dr. Jerry Jackson. We would ask that that be marked as PUB-1.

CHAIRMAN: That will be marked PUB-1.

MS. DESMOND: And Mr. Chair, there are two additional documents, the responses of Dr. Jackson to the IRs of the Public Intervenor and the responses of Dr. Jackson to the IR's of the applicant DISCO. So if we could ask that they be marked respectively as PUB-2 and 3.

CHAIRMAN: Those documents we have marked PUB-2 and PUB-3. Are there any more exhibits to be marked? Is the Applicant ready to proceed.

MR. MORRISON: Yes, Mr. Chair. At this time I would ask Neil Larlee to take the stand.

NEIL LARLEE, having been duly sworn, testified as follows:

DIRECT EXAMINATION BY MR. MORRISON:

Q.1 - Good morning, Mr. Larlee.

A. Good morning.

Q.2 - Would you please state your name and position for the record, please?

A. My name is Neil Larlee. I am manager of regulatory studies and load forecasts at NB Power Distribution Customer Service Corporation.

Q.3 - And, Mr. Larlee, although there is no what we would traditionally call pre-filed evidence, there is a document that has been marked previously as exhibit A-4 which is the pre-filed load forecast and related exhibits. Was this document prepared under your direction?

A. Yes, it was.

Q.4 - And do you adopt that document as your evidence for the purposes of this proceeding?

A. Yes, I do.

Q.5 - Now, Mr. Larlee, do you have any changes or clarifications to your evidence that you would like to advise the Board of at this time?

A. Yes, I do. There is two -- two typographical errors that I would like to get corrected on the record. If you refer to exhibit A-5, which is the responses to interrogatories dated November 1 --

Q.6 - Excuse me, Mr. Larlee. Could I ask you to bring the mic' a little bit closer to you, please.

A. Is that a little better?

Q.7 - Yes.

A. Yes. It's exhibit A-5, responses to interrogatories dated November 1, PI IR-4. PI IR-4. Once you have that, I will take you to the proper table. Everyone have that?

Go to table 5 which is on page 6 of that response, the row that is entitled 1997/1998, under the column that is labelled System Net. The number you should see in the response is 18,816. The correct number is 14,816. So again if you look under the column System Net you should see a number 18,816, right within the first -- it's the

fifth line of the column, and the correct number is 14,816.

The second typographical is again in the same response but on table 7. Table 7 appears on page 8 of the response. So on page 8 and at table 7, if you go to the row entitled 2012/13, under the column Peak Demand -- so it's three lines up from the bottom. What is on the table it should stand out, it's 352. It's off obviously by an order of magnitude. It should be 3552.

So I apologize for these transcription errors but these are all entered in by hand.

MR. MORRISON: Thank you, Mr. Larlee. Mr. Chairman, as is the practice of this Board in the past, where there were matters raised by any of the experts that -- where evidence has been filed that we would like to address, it is usually the practice to address it at this point in rebuttal. And I'm going to draw Mr. Larlee to a couple of references to both Dr. Jackson and to Mr. Olson's testimony and ask him to provide some comments in rebuttal.

CHAIRMAN: Go ahead, Mr. Morrison.

MR. MORRISON: Thank you, Mr. Chair.

Q.8 - Mr. Larlee, if you could turn up -- I believe it has now been marked as exhibit PUB-1, and it's the evidence of Dr.

Jackson. And if you could turn to page 6 of Dr. Jackson's evidence, and the first full paragraph on that page has a number 3.

In that evidence Dr. Jackson says, the heuristic or judgmental model parameter updating process applied by DISCO ignores the opportunity to incorporate information from previous years' forecasting error to improve model parameters and can lead to increased future forecasting error. Do you have any comments with respect to that statement, Mr. Larlee?

A. When I read the statement it appears to me that it's implied that heuristic and judgmental has similar meanings. DISCO's load forecast is more heuristic nature than judgmental. The model uses historical load data as a basis of the forecast of future requirements. Then we apply adjustments to account for known variances from history, a good example of which is natural gas.

DISCO does not compensate for the previous years' forecast error but rather uses the most recent weather adjusted actuals to parse the residential load into electric heat, water heat and base load. In this sense DISCO's model is recalibrated each time it is performed.

Q.9 - If we can turn to -- I believe it has now been marked as PUB-2 -- it's either PUB-2 or 3. It's the response to PI

IR-15. That might be PI-2. Sorry, Mr. Chairman. Just looking at my notes from a few moments ago. In any event, it is response to PI IR-15, and in that response essentially Dr. Jackson says that he believes New Brunswick Power's time estimate required an associated cost to implement a complete load research program is over-estimated. Do you have any comments on that statement?

A. I stand by our estimates of time and dollars to develop a general service small industrial load research program. This is based on our experience from the residential load research program and it's our best estimate. Two winter peaks should be captured to ensure that we get reliable repeatable results. This will require up to two years of data collection plus the time to process and analyze the data. As well timing with the business planning cycle must be considered.

Regarding Dr. Jackson's point that many of the 650 interval meters already installed on the general service small industrial class can be used, these meters are installed on larger customers. The general service class in particular is made up of 40 percent small customers which will require the use of completely different meters. As well, existing meters can only be used if these

customers are likely to be selected for the sample as any other customer in the sample population.

Q.10 - Thank you, Mr. Larlee. I would ask you to turn now to the evidence of Mr. Olson and Ms. Nieto, which I believe has been marked as PI-1.

And if you can turn to page 6 of that evidence, beginning at lines 8 to 13. Either Mr. Olson or Ms. Nieto or both have said NB Power has not sufficiently integrated DSM and DR into its load forecast.

NB Power estimate that NB Power estimates that DSM and fuel switching will reduce its 2014/15 load by 313 gigawatt-hours (energy) and 82 megawatts capacity in the alternative fuel scenario. This is about 1.8 percent of energy and 2.3 percent of capacity.

It appears that NB Power accounts for its estimate of the energy and capacity reduction that would naturally occur, but not energy and capacity savings that would result if it were to actively pursue DSM/DR programs.

Do you have any comments with respect to that statement?

A. Yes. First the numbers quoted by Mr. Olson and Ms. Nieto are incorrect. As shown in table 10 on page 30 of the load forecast document, which is included in exhibit A -- I don't think there is a need to turn that up -- but

DISCO estimates by 2014/15 that energy efficiency will be reduced by 282 gigawatt-hours and 62 megawatts.

In addition the forecast includes a reduction of 313 gigawatt-hours and 82 megawatts for lost loads to natural gas. As a result their estimated percentages are underestimated by nearly half.

Secondly, there are currently no new DSM or demand response programs that can be included in the forecast. And as such an estimate of naturally-occurring efficiency and conservation continue to be the only measures included in DISCO's forecast.

As stated in the response to PI IR-6, which is in exhibit A-5, DISCO's capacity and planning process uses integrated resource planning or IRP, which is comprised of five steps. Preparing a load forecast is the first step. Screening and evaluating DSM potential is clearly completed as a separate step in that process.

Q.11 - Finally, Mr. Larlee, if you turn to pages 8 to 10 of Mr. Olson and Ms. Nieto's evidence, they are highlighting how four utilities have used DSM in their load forecasting.

Do you have any comments on their summary of these utilities' programs?

A. These programs seem to center more on the IRP process

than load forecast. The IRP process used by DISCO, as shown in appendices 5 and 6 of exhibit 5 are strikingly similar to those used by Puget Sound Energy, Kentucky, Georgia Power Company and Idaho Power.

The only difference that I could see is that DISCO does not have specific DSM programs to include in its load forecast and does not include DSM potential programs as sensitivities to that forecast. If it did it still could easily be added to Mr. Olson's and Ms. Nieto's list of cases.

In the last IRP performed by NB Power, sensitivities on various DSM scenarios were included, but as part of the integration process rather than in the load forecast.

MR. MORRISON: Thank you, Mr. Larlee. I would ask you to bring the mic' just a little bit closer. I'm having difficulty hearing you. But I don't know whether anybody else is.

Mr. Chairman, that is all of the questions I have for Mr. Larlee. And he is now available for cross-examination by the Intervenors.

CHAIRMAN: Thank you, Mr. Morrison and Mr. Larlee. Just for the record, I notice Mr. Peacock has arrived to represent Vibrant Communities.

MR. PEACOCK: Yes, Mr. Chair. Again, I apologize for my

habitual tardiness.

CHAIRMAN: It was to be expected. When you weren't here I said, you know, I would recognize you when you got here. I understand that you are a new father since we last saw each other. Congratulations.

Mr. Plante, do you have any questions for this panel?

MR. PLANTE: We have no questions.

CHAIRMAN: Mr. Coon, do you have any questions?

MR. COON: Yes, Mr. Chairman. We will move up so we can --

CHAIRMAN: Yes. If you can move up please. Thank you.

CROSS-EXAMINATION BY MR. COON:

Q.12 - Good morning, Mr. Larlee.

A. Good morning.

Q.13 - I have a few questions I would like to pose and they are pretty much all focused on evidence in exhibit A-4 which was the pre-filed load forecast. I would like to start in the Forward to that, since you have got it open. In the Forward on the first page there is a description of how the forecast results are used, on page 1. And it lists among those to provide NB Power Generation Corporation with the forecast of in-province requirements. I'm just wondering why that would be, why would these results be produced and used by NB Power Generation Corporation?

A. The generation corporation presently supplies all of DISCO's needs. So it's -- historically this has been the case and it is today. So it is a document that they would make use of for their own planning purposes.

Q.14 - Under the current Electricity Act, Mr. Larlee, isn't it the case that DISCO, if it deems that it requires new load, is required to issue a request for proposals to supply that load -- or that power?

A. My understanding of the Act is that for long term load requirements, a process that would include RFPs has to be established, yes.

Q.15 - So given that, would not these forecast results also be available and used by private power producers?

A. Well this load forecast document is now publicly available and has been for quite some time. Certainly it's available for any hypothetical RFP or any people interested in being part of that process to make use of.

Q.16 - So you would agree that it would be as useful to a private power producer as it would be to GENCO in terms of potential RFP in future?

A. I would think so, yes.

Q.17 - And similarly would the forecast results also not be useful to Energy Efficiency New Brunswick in terms of their planning to pursue energy efficiency opportunities

in the province?

A. I can't speak for Efficiency New Brunswick but I would assume they would have some interest in our load forecast, yes.

Q.18 - And specifically what sorts of items within or information within the load forecast would Efficiency New Brunswick find useful?

A. Well I would think they would be particularly interested in the efficiency and conservation measures that we have included in the forecast, and possibly they would also be interested in the fuel switching adjustments that we include in the forecast as well. They probably would also be interested in the load growth that is being forecast, so that that could be part of their planning process.

Q.19 - And as I read the document, the load growth being forecast over ten years is roughly 2,000 gigawatt hours in energy and 280 megawatts in capacity. Is that correct, give or take a bit?

A. Yes, that's correct.

Q.20 - I would like to move on to -- still staying in the Forward here. You say that the energy forecast is based on a 30 year average of temperatures between 1971 and 2000. Is that correct?

A. Yes, that's correct.

Q.21 - In the face of climate change, can you quantify the impact on the energy forecast if you instead used the average temperature taken over 1990 to 2005?

A. You are looking at basically going to a 15 year period as opposed to the 30 year period that we are using?

Q.22 - Recognizing that most of the measurable impacts of global warming have been apparent over that period of time, yes, to capture those changes.

A. We haven't done any analysis on using a 15 year period. We have done -- we have looked at some sensitivities using the most recent ten year period, and we found, if my memory serves me correctly, so it would be subject to check, that it's in the order of 60 to 90 gigawatt hours would be the impact on the forecast.

So just to make it clear we use -- we use a 30 year normal for degree days, stating basically the assumption being, since we can't accurately predict weather, that we are most likely to have weather in the future that will reflect the long term average temperature. We used 30 years because that's the number provided and used as a standard by Environment Canada.

So we have looked at, well what if we used an average for degree days over a period of ten years to see what the

sensitivity is, and we found it's in the order of 60 to 90 gigawatt hours.

Q.23 - And what period -- what ten year period would that have been for, between which years?

A. I believe at the time we were using the most recent ten years. So that would have been '95 to 2005.

Q.24 - And can the results of that analysis be provided to this hearing?

MR. MORRISON: Mr. Chairman, if they are available we would have no problem in providing them. I don't think there is any confidentiality issues involved. The only question is if it's available. Otherwise it might take some time. We don't want to start creating data, I guess is the --

CHAIRMAN: Is it available?

DR. SOLLOWS: You mean creating analysis.

MR. MORRISON: Collecting data and analysis. Thank you, Dr. Sollows.

CHAIRMAN: Is it available or --

A. I'm searching my memory and I think there is a high likelihood that we will have to recreate the analysis. But I will -- we will have to look and see.

MR. MORRISON: We will look to see whether it is available, Mr. Chairman.

CHAIRMAN: Thank you, Mr. Morrison.

Q.25 - Thank you for looking it up. Could you please repeat though the impact that you recall about that analysis over the 10 year period?

A. I believe it's in the order of 60 to 90 gigawatt hours.

Q.26 - Thank you. Now did you do a similar analysis around the impact on annual demand forecast using the average temperature at time of peak for the same 10 year period?

A. I don't believe we have looked at that sensitivity in the past, I mean. And of course we could always look and do some analysis in that regard.

But I think it's important to note here that when you are talking about peak hour demand you are talking about a much shorter period. And what we use is the rolling eight hour temperature. And history seems to show a very short spike in temperature doesn't affect demand so much as when temperature has settled in over a period of about -- somewhere in the order of eight hours.

But we are not talking about an annual figure here. This is a very short time period. And I don't believe that there is anything that indicates that the weather has become less subject to very cold periods or very warm periods. So I'm not sure there is any merit really in looking at a shorter period for average temperature.

Q.27 - Thank you, Mr. Larlee. Has your group done any studies looking forward into the impact on degree days as a result of global warming in our region?

A. No.

Q.28 - Thank you. I have a couple of questions with respect to the residential forecast, staying with the same exhibit. In the load forecast -- the first question is simply a -- with respect to the number of year-round customers, which will be on page 9, 2.2.2.1. It says here that the overall population's forecast to increase by only 1,300 people in the forecast period, is that correct?

A. Yes. That's what it says.

Q.29 - Is there a reference for projecting the population change in that time period?

A. We would have sourced that information from the New Brunswick Statistics Agency.

Q.30 - So just to be clear, it would have been based on a population forecast supplied by the New Brunswick Statistics Agency to DISCO?

CHAIRMAN: Excuse me, Mr. Coon. Mr. Hyslop?

MR. HYSLOP: Could I ask Mr. Larlee just to speak a little louder? I'm having a hard time catching his testimony here, Mr. Chair.

A. I'm going to be swallowing this thing soon. But let's

try that.

Q.31 - Just to repeat the question, so you would have obtained a population forecast for that time period by New Brunswick Statistics Agency, is that correct?

A. Yes. At the time the forecasters prepared, we would have talked to them and got a forecast from them.

Q.32 - Thank you. My next question has to do with the section around the appliance efficiency model on page 10.

At the end of that first paragraph, it says that the model assumes all new appliances will meet existing energy efficiency standards.

What standards are you referring to there?

A. There is national standards for appliance efficiencies. And as new appliances are manufactured, they have to meet the government standards.

Q.33 - So it would be correct to say these standards set minimum standards for appliance efficiency?

A. I would assume that yes, that's what the standards are doing, yes.

Q.34 - Thank you. Are you familiar, Mr. Larlee, with the Energy Star rating system or the Energuide rating system for appliances?

A. Yes. I'm somewhat familiar with it,yes.

Q.35 - So my understanding is Energy Star establishes or

provides a label for appliances that meet higher standards of energy efficiency than the minimum standards.

Would that be your understanding?

A. Yes.

Q.36 - And Energy Star products are labeled as such to provide information to the consumer about those particular models that consume less power than the standard ones on the market, is that correct?

A. I'm sorry. Did your question -- are you asking about the labeling?

Q.37 - Yes, the Energy Start labeling?

A. I'm not familiar with the Energy Star labeling. I'm familiar with the Energuide labeling. I have seen it on appliances. But I didn't realize Energy Star, other than their logo which is quite common. I'm not familiar with any specific labeling for Energy Star.

Q.38 - What was done -- or was anything done with any appliance efficiency model to make an estimate about what percentage of new appliances that were purchased would exceed existing energy efficiency standards based on the Energuide labeling program?

A. Well, I believe -- and this would be subject to check. But I believe that the consumptions that we are using the model for, new stock, would represent an average of the

new stock coming on line.

So those consumptions would include some level of Energy Star appliances and a certain level of more typical -- or as you referred to, minimum standard appliances. So that the model includes -- would include a blend of appliance efficiencies.

Q.39 - Can you undertake to just confirm that, that it is an average of the new models in stock as opposed to, as it says here, the assumption that all new appliances meet existing energy efficiency standards which would be a minimum number?

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

CHAIRMAN: Thank you, Mr. Morrison.

MR. COON: Thank you.

Q.40 - Sticking with the appliance efficiency model for a moment, have you had -- prior to developing this forecast did you have any -- do any consultation with Efficiency New Brunswick to determine whether or not they were contemplating an appliance efficiency incentive program?

A. When this forecast was prepared, Efficiency New Brunswick wasn't an agency, didn't exist. So there is no way we could have consulted with them.

Q.41 - So could you just remind us of the dates that this load forecast was prepared?

A. The date is on the front. It was published in May 2005. So the actual analysis would have been completed in late 2004.

Q.42 - Might it be the case that if Efficiency New Brunswick offers a rebate program or an incentive program to encourage the purchase of higher efficiency appliances, that the forecast resulting from the appliance efficiency model might represent an overestimate of demand in that end use?

A. Well, if we want to talk about future forecast and how we would handle any programs that flowed from Efficiency New Brunswick, we would include any program targets that Efficiency New Brunswick had, whether it is an appliance efficient program or lighting program or what have you in the forecast.

But DSM programs have to be measurable and verifiable. And, you know, we would anticipate that any programs that come out of Efficiency New Brunswick would meet those types of standards. And we would include them in the forecast.

Q.43 - And when would the next load forecast be done that might contemplate the existence of Efficiency New Brunswick?

A. Well, the next forecast would probably be started in

the late, late summer of 2007. So if at that time we have some targets from Efficiency New Brunswick, we will certainly be looking at them to include in the forecast.

Q.44 - Thank you, Mr. Larlee. On page 11 here it suggests that electric space and water heating normally accounts for 67 percent of average household energy use. Are you still confident that that is the case?

A. Yes.

Q.45 - Thank you. Of that are you able to say what percentage overall of household energy use is represented by the water heating itself?

A. Yes. I believe it's on the record in response to an IR, which I don't have right now. But it's about 20 percent.

Q.46 - 20 percent?

A. Yes.

Q.47 - So in the appliance efficiency model, just to try and better understand it, does it account for shifts in water heating technology, a shift to demand heaters, for example, increasing use of solar hot water heaters, things that represent different technologies than the standard one of storing hot water in a tank?

A. No. The water-heating model is driven by the number of persons per household. So the forecast for the number

of persons per household is dropping. So our water-heating consumption forecast is dropping in concert with that.

Q.48 - If there was increased use of tankless water heaters or solar hot water heaters, how might that affect your forecast?

A. If we saw increased use in those technologies, we would have to look at them and assess how they would impact the forecast.

In the case of solar hot water, you could assume that you would have lower consumptions in the summertime, lower energy consumptions to heat hot water in the summertime.

In the case of tankless hot water technology, your energy consumption would likely be affected. Because of course you would have little or no standby losses because there is no tank involved.

But your demand or your capacity is impacted quite significantly. Because of course in order to heat the water they have very high capacity elements. And those technologies would have to be assessed.

Q.49 - Thank you. By the way, do you know -- is it still the case that a customer who wishes to install solar hot water heating is not permitted to hook that into a water heating unit rented from DISCO?

A. I'm not familiar with the details of our water heating policy. But I do know that they are geared towards safety. And any time that a customer alters how a water heater is supposed to be installed can have some very serious consequences.

Obviously if the thermostats are overridden or if the pressure release valves are altered in any way, the tanks can rupture and explode. So safety is the primary concern around all of our water heating policies.

Q.50 - Thank you. With respect to the average use per -- energies per year-round customer, understanding that this was developed prior to the creation of Efficiency New Brunswick, now that it is up and running, are you familiar with the two programs it has in place to increase the energy efficiency of New Brunswick households?

A. Well the programs that I'm aware of is the Energuide for Homes program where there is some support to having a home tested. The other program that Efficiency New Brunswick has that I'm aware of is a pilot program to help insulate mobile homes. Are those the two you are speaking of?

Q.51 - Well are you familiar with the program which provides a $10,000 zero interest loan to help New Brunswick households to reduce their energy demand through

efficiency improvements?

A. No, I wasn't aware of that specific program, unless of course that is the one related to mobile homes.

Q.52 - No, it's not. It's for conventional homes. And there also is a companion program that provides direct financial assistance to lower income households to reduce their energy demand through improvements in energy efficiency. Are you familiar with the low income household incentive program?

A. I'm not familiar with the details of that program, no.

Q.53 - Would you expect that these programs, if they were successful, in fact would have an impact on the accuracy of this load forecast going out ten years?

A. No, I wouldn't, and I guess there are two reasons for that. We have -- in the forecast we have built into it what we call an improvement to the thermal efficiency or the thermal envelope of homes. In other words, the amount of energy in the forecast to heat a home is reduced by half a percent every year to take into account the fact that people are continually improving the insulation levels of their homes.

And at this point, without any targets from Efficiency New Brunswick or any quantification of the impact of their programs, we are assuming that the impact of their

programs will fall within -- will fall within the amount of the energy reductions that this adjustment in the forecast or this component of the forecast takes into account.

Q.54 - Mr. Larlee, whose responsibility is it to ensure that any targets that exist at Efficiency New Brunswick for reducing energy use through improvements in energy efficiency find their way into the load forecast?

A. That would be my responsibility, to make sure that -- well I guess it's my responsibility to make sure that any known changes in the future that aren't going to be -- aren't going to be picked up in the models that are basically looking at the past and how energy consumption changes in the past are included in the forecast.

Q.55 - You do an annual forecast a year ahead, is that correct, Mr. Larlee?

A. I guess I'm not clear when you say a year ahead. We typically do a long term forecast every year. Some years we wouldn't do the full forecast. We would do -- basically just update the previous years' forecast if we thought that there was no need to do a, you know, complete bottom up forecast. Typically we do a long term forecast which would include the next year and go out five, ten or in some years we have even gone 20 years.

Q.56 - So have you done one of these forecast updates since Efficiency New Brunswick was established?

A. Well we are in the process of doing one now. We have a forecast update that hasn't been approved by our board of directors yet, but as part of our annual planning process, yes.

We had one during the development of that forecast, like I said, which started in the summer. We made contact with Efficiency New Brunswick and they were unable to provide any targets. So we basically made the decision -- I made the decision that we would go with our existing efficiency and conservation adjustments that are in the forecast.

Q.57 - So Efficiency New Brunswick was unable to provide targets this past summer to -- but were you apprised of the details -- I guess you have already said this to us. Why were you not apprised of the details of their specific residential energy efficiency programs in the absence of targets?

A. I didn't see the need to delve into their programs, given that there were no targets -- there were no targets available. Essentially I saw it as they were continuing -- in at least one case they were continuing the federal programs into the future. So I felt that our existing

adjustments were reasonable.

Q.58 - So just to be clear, you are saying that you didn't feel it was germane for you to be aware of their specific program details in the context of any influence that might have on the analysis in your load forecast?

A. Well if the agency that is actually developing the program, or implementing the program, can't provide targets on how that program is going to affect electricity consumption, I felt that I certainly wasn't going to be in a position through whether it was discussions with them or doing any other type of research -- I didn't think I was going to be in a position to produce those targets.

So as a result, we didn't embark on any type of research project to try and ascertain the effect of their programs.

Q.59 - Have you made a request to Efficiency New Brunswick for a description of their plan programs that currently are expected to be implemented over the next year or two?

A. I haven't personally, but we have staff at DISCO that are working with Efficiency New Brunswick or are in contact with them, and are apprised of their programs. Our energy advisers and other staff are making our customers aware that those programs are in place and that they exist, and are referring customers to Efficiency New

Brunswick in the cases where that makes sense.

Q.60 - Thank you. I want to move on to general service category of customers here. On page 15 under General Service and Streetlighting Forecast, it's 2.3 of the exhibit before us, you describe the breakdown of total sales in that general service class as 70 percent of the total are commercial in nature and 30 percent are institutional in nature, is that correct?

A. I guess you are going to have to show me where you --

Q.61 - At the top of page 15, just prior to the section on the econometric model where it describes the breakdown in general --

A. Oh, yes. I see it now. Thank you. Yes.

Q.62 - Okay. Can you just explain what comprises the institutional sector?

A. Hospitals, schools, government office buildings. And that would be all three levels of government. So municipal, federal, provincial, any other government type buildings, warehousing, that sort of thing, DOT garages, regional offices. I'm sure I'm missing some, but that sort of -- that's what comes to mind straight away.

Q.63 - Are you familiar with the lead certification program for these kinds of buildings?

A. Can you repeat that please?

Q.64 - I was asking if you were familiar with the lead certification program, lead standards for these kinds of buildings?

A. No, I'm not.

Q.65 - So you are unfamiliar with the -- it is called the Leaders in Energy and Efficiency Design for New Commercial Construction and Environmental Design?

A. I haven't -- no. I don't have any details on that program.

Q.66 - Are you familiar with the newest government buildings that have been constructed or are under construction are being built to higher efficiency standards under the lead program?

A. Well, I would assume -- I mean, it's not surprising. It's common sense that the new buildings are built to higher standards. And that would include energy efficiency standards.

We have to remember that in the general service forecast we do have an adjustment for efficiency measures. And that adjustment has its foundation in a DSM program called the Public Buildings Initiative. So that it would capture improvements in the efficiencies in the sector.

Q.67 - Does that adjustment actually reflect the strict standards required under the lead certification program

which the Province of New Brunswick is pursuing?

A. We haven't done an engineering type analysis that would attempt to measure those particular impacts of that program, no.

Q.68 - Has your group done any studies or analyses in the context of this load forecast to look at the trends in energy efficiency improvements in new building construction, new commercial building construction in the private sector?

A. No, we haven't.

Q.69 - Are you familiar that the first privately developed commercial building has been built in Moncton to lead standards?

A. No. I wasn't aware of that fact.

Q.70 - In the consultations you mentioned that some of your staff has been having with Efficiency New Brunswick -- well, let me ask you. Is it fair to call the discussions between your staff and Efficiency New Brunswick consultations?

A. I would think that's fair, yes.

Q.71 - Thank you. In those consultations have they been apprised of the commercial retrofit programs that Efficiency New Brunswick is planning to implement that would have some kind of impact on the general service

customers?

A. I haven't been party to those discussions. But I don't see why they wouldn't have been part of the discussions.

Q.72 - Let me switch over now to the industrial section of the load forecast which takes us to page 20. Well, let's see. 19 I guess, section 2.4.

I'm just trying to follow through here on terms of the large industrial customers. Here is -- the forecast says in the pulp and paper industry there are 11 customers that normally accounted for 70 percent of total industrial transmission sales.

Are those 11 customers still all customers of DISCO?

A. Yes, they are. But I think one customer, since this forecast would have been prepared, is no longer in production. And they are actually a net producer of electricity.

Q.73 - Can you just explain what you mean by that?

A. Well, many of our industrial customers have their own generation or what we refer to as self-generation. In this particular case this customers had a small hydro dam it was using to offset its requirements from us for its mill operations. The mill operations have ceased. The hydro dam is still in operation.

Q.74 - Thank you. As the pulp and paper companies represent the majority of your industrial transmission sales, has your group done analyses to look at the potential for one or more further mill closures in the province?

A. The industrial -- the large industrial forecast, which we are talking about right now, is done or has its foundation in a customer by customer approach.

So the account managers responsible for these accounts are in conversation with those customers, stay on top of what's going on in their particular businesses, and essentially forms the basis for our forecast.

So as soon as we have information about either load additions or load reductions or closures, then that information makes its way into the forecast.

But you have to appreciate that these customers, when they are growing and when they are adding load, are much more likely to talk about it and to tell us about it than when they are facing potential closures.

As well, many of these customers are part of large multinational corporations. And the local operations may not be aware of potential closures until very, very near the event. So there really is no information available to us in those situations.

Q.75 - Thank you. If we can turn to page 22 under Industrial

Forecast Results. That is section 2.4.5. In the forecast it suggests that while large industrial transmission customers have the option of choosing an alternate supply of electricity or of adding or increasing supply, you have made no allowance in the forecast over these 10 years for any loss of customer load in either of these manners, that is either as a result of them choosing an alternate supplier or increase their self-supply.

Is that correct still today?

A. It was correct at the time this forecast is prepared. And it's still correct, yes.

Q.76 - And can you explain the reason for making no allowances for either of these possibilities?

A. Well, the reason is right in the document, that DISCO has no information to indicate that these customers either have -- or have self-generation projects planned or have plans to exercise their right under the Electricity Act to seek alternate suppliers.

Q.77 - Are you familiar with the plans the Irving Group has for building a natural gas-fired power plant in association with the LNG terminal?

A. Yes. And in our next forecast we will be including the net load addition that the LNG terminal is anticipated to add to the system.

Q.78 - And have you had any conversations with the company about the use of that electricity, where it may be sold?

A. Our Account Managers have been talking to the principals involved. And the information we are getting is that it will be a net load addition and not a net generator. Exactly contractually how that transpires, whether or not the energy from any self-generation is sold directly or gets netted out on the load, I mean, that all has to be worked out.

But as far as the -- at this point, the impact that we are putting into the load -- the future load forecast, it's not included in this one that we are looking at here today. But in the future load forecast it will be a net load addition.

Q.79 - Are you familiar, Mr. Larlee, with the discussions around self-generation using biomass in the pulp and paper sector in New Brunswick?

A. Well, I don't know if you would characterize it as discussions around. I mean, there are pulp mills today that are using biomass. It's part of the process in certain types of pulping operations.

Q.80 - Are you aware of any of your customers who are contemplating increasing their self-supply using biomass

for electricity?

A. Not that I'm aware of, no.

Q.81 - Thank you. If we can turn now to the section on elasticity? Price elasticity that is on page 30, section 2.5.3. With respect to the impacts of price on consumption or demand, you provide information on how the forecast might be affected by anticipated rate increases for the residential and general service customers and wholesale customers. What I don't see here is what would the -- in this analysis -- what the impacts would be on the industrial customer classes?

A. There is no adjustment in the forecast for elasticity in the industrial class, and that's just a function of the reality that it's difficult, if not impossible, to produce elasticity numbers that would allow you to do the adjustment.

In the large industrial class there is so many factors involved besides price. And in addition to that, it's very lumpy loads, so that the load is added or subtracted from the system in very large chunks.

So if you were to go and look back at history and try and correlate changes in load with price changes, you will get some very, very strange results, because your industrial load may not be coming on or leaving the system

at the same time as price changes.

So there is that difficulty. But I mean, the real crux of the matter is that there is just so many other factors involved that it's not practical to put an adjustment in the forecast.

Q.82 - If I understand you, what you are saying is there may be impacts on industrial use as a result of price but it's too difficult to do the analysis to come up with some kind of possible impact in a quantitative fashion, is that correct?

A. I wouldn't say that it's too difficult. I would say that it's not practical. I mean that wouldn't prevent us from -- if we know or if we think that there is going to be a significant downturn in the economy, that wouldn't prevent us from putting in an adjustment to take that into account in the industrial sector.

We have done that in the past. We prepared a forecast around the time of 9/11 and at that time everyone was quite convinced that the economy was going to take a significant downturn. So we put adjustments in the forecast to take that into account. So it wouldn't -- it doesn't mean that we couldn't adjust for significant events, it just means that there is no practical way to do it in this particular case.

Q.83 - Thank you. I just have a couple of questions from my colleague, Mr. Couture, and then we will wrap up.

CROSS-EXAMINATION BY MR. COUTURE:

Q.84 - Generally the importance of considering efficiency in the larger picture of load forecasting, is it possible that the distribution corporation is underestimating the overall potential of efficiency to actually help stabilize load requirements, as has happened in Vermont, with the success of Efficiency Vermont.

Efficiency Vermont was put in place in 1999 and with the success that they have had with their efficiency investments they are looking at an overall load stabilization in the next five years, bringing it back down to zero growth.

So is there a potential with that information in mind, of the success in another jurisdiction, that we may be underestimating -- that the distribution corporation may be underestimating the potential impact of efficiency on the whole?

A. Well it's a forecast. So a forecast is going to be wrong. I mean, we have to accept that. We try to create the best forecast we can. So to answer your question directly, is there a potential, yes. Of course there is. The process we are taking is we are including in the

forecast the energy efficiency and conservation measures that we think are going to happen without any active DSM program coming in and altering the market, either through some type of incentive or other types of measures. As Efficiency New Brunswick rolls out these programs, and my understanding is they are looking at Vermont very closely as their model, we will include their targets in the forecast -- and of course when I say that I am assuming that they are going to meet the accepted industry standards for DSM programs. We do have in our forecast that we are looking at here today -- we do have efficiency and conservation measures in there that are very similar to what was included in the forecast prepared for the Point Lepreau hearing. And at that time the Board had a consultant review that forecast and indicated that we probably had too much efficiency and conservation in the forecast. So I think that we have got a reasonable amount of efficiency and conservation in there now and as we go forward and as Efficiency New Brunswick moves ahead we will be working with them as we are today.

Q.85 - Returning to the question of self-supply and self-generation that was raised earlier. It has been shown that a number of different industries throughout the province, pulp and paper mills and other large energy

consumers, have been moving towards cogeneration and increasing the utilization of that technology to reduce their overall electricity needs. Do you feel that that has been adequately factored in by the distribution load forecast?

A. Yes, I do. The reason for that is because every year when we are looking at the forecast we sit down with the account managers after having given them due notice so that they can get on the phone or go out and visit their customers, and we look at every customer one by one, what their plans are, what their past load looks like, what -- you know -- what they are planning to add as far as load, certainly if they are planning to increase or add self-generation. That's all included in developing a forecast. And if they have plans that go beyond the first year, those are included as well. So it's a very -- it's a very thorough process and my understanding of the industry is it's pretty well the only way that you can forecast these large industrial customers.

Q.86 - Considering some of the projected trends in rate increases and given the impact of the importance of rate increases in stimulating energy efficiency and energy conservation measures in individual homes, is it possible that that has been underestimated as well, if rate

increases are projected to continue?

A. Well that's why the elasticity measures are included in the forecast. So that captures or should capture the effect that rate increases are going to have on the residential and general service class.

Q.87 - Now a more general question. On both page 12 and page 16, there is mention of the decreasing impact -- the declining impact of natural gas on existing sales. With the LNG terminals and a lot of the discussion of increasing the natural gas input into the province, I'm just wondering in general why we would be projecting a decline by the end of the projected ten year period in natural gas?

A. Can I ask you to take me to the reference, just so I have got the context.

Q.88 - On the bottom of page 12, year over year growth, this is in 2.2.3. in the residential forecast results -- year over year growth is higher in later years of the forecast as a result of reduced price elasticity impacts and declining impact of natural gas on existing sales. And then if we turn to page 16, the same point is repeated at the bottom of the first paragraph, declining impact of natural gas on existing sales. I'm just wondering why a projected decline given the activity of

natural gas in the province?

A. I guess the key point here is we are talking about existing sales. So in any greenfield market, what our research found is that as a product is taken up it tends to follow what we call an S-curve. So a new product comes in, people are a little leery of it, they don't know too much about it. So it's taken up and replacing their existing -- in this case we are talking about natural gas, so they are switching out their heating and their barbecues and water heaters, as their neighbour does it and maybe they feel a little more comfortable about it and as they see a little bit more about it in the media and advertising and so forth.

So then the actual switching or the conversions will peak. So you go from quite a low take up and then you are going to get -- you are going to get a more rapid take up. Basically you have reached some type of critical mass of customers taking it up, oh, my neighbour has it, I got to get it, or no, I'm not going to -- you know, it becomes almost like keeping up to the Jones.

And then of course as that stock of existing appliances is getting switched over, there is less and less opportunity. So the S-curve sort of flows out like this and eventually it's completely saturated. You have

either gone to 100 percent, you have switched everyone out, or you have basically hit the maximum saturation that you are going to see of switching out the existing stock. So that's what this is referring to. It's not saying that new customers are going to all of a sudden stop taking natural gas. We are talking here specifically about the existing customers.

Q.89 - Thank you. And one last question to return to considerations of temperature. On the first page -- the very first page on the forward, at the very bottom of the page, it says, energy requirements and the peak hour demand are affected by weather conditions, the most significant being temperature.

Given the projected trends that we have and some of the trends in the last 15 years of weather analysis and data, some of the warmest years on record have been recorded since the 1990 period, the warmest year on record being 2005, the beginning of the projected load forecast.

Given that trend and given the cited important of temperature on overall energy demand in the province, is it possible that our overall demand in relation to energy consumption as it's related to heating requirements in particular will decline lower than the projected curves?

A. Well I guess as I said earlier, anything is possible.

There is no doubt that we have seen some of the warmest years on record within the last decade or 15 years. We are using the 30 year normal because we feel that that's the most reliable number we can get and it's the number provided by Environment Canada.

I was encouraged to see a study not too, too long go -- a survey of other utilities that 50 percent or more of other utilities -- other utilities also used 30 year normals. So it's still a relatively common practice and we basically think it is still going to give us good results into the future.

Q.90 - What is it that is used instead of the 30 year trend, the other 50 percent?

A. I believe probably -- I would have to check this, but the next most common would be a ten year, using the ten year normal.

MR. COUTURE: Thank you very much. I conclude.

MR. COON: Thank you, Mr. Larlee. Mr. Chair, that concludes our cross. Thank you.

CHAIRMAN: Thank you, Mr. Coon. Before I get to Mr. Roherty and all, I would like to tell everybody to be on their best behaviour. Our old Chairman is in the room, sitting down way down back there. He is so far back the wallpaper is sticking to him. And I don't mean old in a derogatory

sense. Experienced, past, whatever. I didn't mean that in a derogatory sense.

Mr. Roherty, have you any questions for Mr. Larlee?

MR. ROHERTY: No questions, Mr. Chair.

CHAIRMAN: Mr. Peacock, do you have any questions for Mr. Larlee?

MR. PEACOCK: Yes, I do, Mr. Chair. If it is all right I can ask them from here, is it possible, or would you prefer that I --

CHAIRMAN: I would prefer to do it from up here.

MR. PEACOCK: Okay. Absolutely.

CROSS-EXAMINATION BY MR. PEACOCK:

Q.91 - Thank you, Mr. Chair, and as you alluded I am indeed a new parent and that means I have -- not only am I a new parent but I'm still working on fixing up the nursery. So my mindset is more about diapers and drywall than demand side management. So as a result, Mr. Larlee, I suspect you will receive some rather gentle questioning, just because my mind is somewhat distracted.

But I think what I would like to start with is -- the first set of questions that we have addresses the idea of how adaptable your methodology is to the regulatory and ministerial direction.

And in our first IR we asked of course does DISCO have

an estimate of how switching to a flat rate for residential usage would impact its ten year load forecast? We asked that question in part because we looked into the near future. We recognized the Board's direction on the question of a flat rate and we also recognize that virtually every Intervenor in the room, including yourself, the Applicant, would like to see the elimination of the declining block rate.

So we wanted to see if of course that step in rate design would be considered in your load forecast, and your response was that, no, DISCO's price elasticity model is valid for overall price increases and cannot be used to estimate the impact of rate structure changes alone.

Now what we find interesting is that your load forecast considers economic assumptions related to newer appliances, efficiencies, et cetera, but we are surprised that it can't anticipate the impact of a flat rate implementation, especially given that the forecast in some cases goes out to 2015.

Our question I guess is does DISCO still assume that a flat rate will be implemented within the next five years? And of course I put forward that assumption based on earlier Board direction.

A. For this forecast there is no assumption with regards

to the actual residential rate structure explicit in the forecast. What is in the forecast are assumptions on fuel switching, particularly to natural gas. But there are also assumptions of penetration of electric heat going out into the future.

So as we move to a flat rate, then I would foresee that forecast being adjusted out in the future as far as the natural gas and penetrations go to reflect that. So one would assume that if we had a flat rate tomorrow, then we would start to see a more rapid adoption of natural gas, and that we would have to reflect in future load forecasts.

But because we don't have with any certainty a schedule for moving to a flat rate, then at this point I wouldn't be able to put any specific adjustments into the forecast.

Q.92 - Okay. Thank you. Because I think you have actually answered my next question which would be that the flat rate may in fact be actively considered in your next load forecast.

In the new government, the newly elected provincial government, in their platform they said that they would introduce demand side efficiency programs for residential customers, such as net metering and time of day savings.

If the new government is keen to introduce time of day savings, would it not be necessary to implement a flat rate structure as a first step? In other words, would not NB Power have to move to a flat rate before it could go to the time of day rate design?

A. As the Board is well aware, I am also responsible for rate design at DISCO. So I can answer that question but as the rate designer. That would be my preference, that the price signals would be better, no question if the rate was flatter, and would enable any type of time of use rate to work better.

Q.93 - Thank you. And I recognize that I may in fact be trying to stretch the load forecast panel beyond its -- but unfortunately I sometimes try and do those things. I guess my point is that given that the impacts that time of day savings have had in other jurisdictions, is DISCO possibly in danger of over-estimating its load forecast requirements if they do not take into account the publicly stated directions on rate design either from the Minister of energy or from this Board?

A. No, I don't think so. Rate design has as one of its tenets gradualism. So I think before we would see a time of day or a time of use type of rate structure that was mandatory, because really that's what you have, that's

what has to be done in order to get any real significant change in load patterns, we are not talking a short period of time. You know, that would take a significant amount of time to get there.

And if we are talking about looking at a time of use rate either on a pilot basis or as an optional rate for customers, the amount of impact on the forecast would be negligible.

Q.94 - Thank you. Really the second phase of my question deals with Efficiency NB and Conservation DSM in its relation to the load forecast. A lot of that ground has been covered by the conservation council, so I will probably only have a few questions in that matter.

As I think you alluded to, you are aware that Efficiency NB has begun implementation of specific home renovation programs. These will no doubt have a cumulative impact on future load.

The -- I think since the preparation of this load forecast, the Efficiency NB has already informed the media of the number of homes that have been signed up to their programs. So I guess would it be fair to assume that as of your next load forecast that there will in fact be say a line item on Efficiency NB data in terms of the quantifiable number of kilowatt hours perhaps reduced as a

result of their specific programs, or do you think that your co-operation with that agency will become that -- will go that far?

A. Well I can't say for sure whether we would have line items in any future forecast. We do have -- we do have efficiencies in the forecast now. The information that we are getting is that the programs that Efficiency New Brunswick does have fall within those estimates that we are making today, but certainly as Efficiency New Brunswick produces targets that we can use, we will then do just as you suggest and put line items in the forecast. In fact if you look back at some of our forecasts from the early and mid '90s we did just that. We put in estimates for each and every DSM -- active DSM program that were in place at the time.

Q.95 - Thank you. Really just one final question and I think it's perhaps something that I would be curious to see DISCO's thoughts on moving forward, not just on the question of load forecasts but future regulatory processes. And it's that your agency, or the Applicant -- you will no doubt be receiving a number of questions related to how you co-ordinate your activities with that of Efficiency NB in the years ahead in order to be better in terms of load forecasting and whatnot.

To make future rate applications easier, would you like to see Efficiency NB more fully participate in the regulatory process?

A. I don't know if it's up to me to say whether I would like them to be here or not. I think the regulatory process certainly works well when all the stakeholders are here. We are working with Efficiency New Brunswick. We feel that we have things to offer. We have provided -- DISCO has provided DSM programs in the fast. We have done screening and evaluation of DSM programs in the past. We have a data base of measures. So we have made all of this known to Efficiency New Brunswick. So we are looking forward to working with them.

MR. PEACOCK: Thank you. That's all my questions, Mr. Chair.

CHAIRMAN: Thank you, Mr. Peacock. It's 18 minutes to 12 approximately, by my watch anyway. Before we move on to Mr. Hyslop, I think we will take lunch. Do you think you will be longer than 15 minutes, Mr. Hyslop?

MR. HYSLOP: I would expect to be longer than 15 minutes.

CHAIRMAN: Okay. I think we will break for lunch and reconvene at 1:00 o'clock. Thank you.

(Recess - 11:45 p.m. - 1:00 p.m.)

CHAIRMAN: I guess now lunchtime, you are all set to go, Mr. Hyslop?

MR. HYSLOP: Yes. I have nothing preliminary. If the Applicant doesn't, I'm ready to go.

CROSS-EXAMINATION BY MR. HYSLOP:

Q.96 - Good day, Mr. Larlee.

A. Good afternoon.

Q.97 - It is good to have you back. Mr. Larlee, I have just some questions about some of your background and role in load forecasting to start.

I understand you are responsible for the overall load forecasting process at DISCO, is that correct?

A. Yes. That's correct.

Q.98 - And I take it that one of the things that is most important in doing any type of forecasting is to have the best information possible within limits of cost, et cetera.

Would I be correct in that statement as a generalization?

A. That sounds fair, yes.

Q.99 - Yes. And as I understand the process, the information that you use, a big part of the information you use, would be the information that you obtain through doing load research and through doing customer surveys, is that

correct?

A. I guess I would have to qualify that. We have an instrument that we call the Energy Planning Survey, which is a mailout survey that we have mailed out periodically through the years to about 25,000 customers. And it used to be called an Appliance Saturation Survey. We have also given it other names over the years.

But essentially we use it to determine the penetration of particular appliances and customers' usage of wood and that sort of thing.

We do have a residential load research program. That residential load research program was designed and conceived primarily for cost allocation purposes. And we have not used information from that particular program for load forecasting purposes for a variety of reasons.

But primarily it's because the load forecast itself, for the purposes of forecasting demand, forecast demand at the distribution level. In other words, in the forecast we don't actually drill down and try to forecast the peak hour demand at customer classes. We do it at a higher level, at the distribution demand level, essentially at the substation level.

And the reason for that is because we have data at that level. We have meter readings from our substations

that we can go back into history and look at those meter readings and use those to establish how our customers are performing when it comes to demand.

So I think it's clear to -- it's important to make the clear distinction between those two programs, and that we certainly use the energy planning survey in the load forecast process. But we do not use -- we do not use load research for load forecast reasons.

Q.100 - Okay. So your load research at the present time is restricted to issues of cost allocation, is that correct - -

A. That's correct.

Q.101 - -- principally?

And however, would it be fair to say that in many jurisdictions, with many utilities, load research is also used in order to gather information to assist with forecasting?

A. Yes. I think that's fair.

Q.102 - Right. Okay. And again just so that the flavor of the question I asked was part of doing good forecasting is, where you are obtaining information, is to obtain accurate information, the most accurate information possible?

A. Yes.

Q.103 - Yes. Okay. And I just want to go back briefly. Your background, you are a civil engineer, electrical engineer?

A. I'm an electrical engineer.

Q.104 - Right. Mid '80s at UNB. Maybe just fill me in a little bit there?

A. I graduated in 1984. And I started working with NB Power upon graduation. I received my Professional Engineering designation two years later, and then subsequently worked as an electrical protection system designer in what was known as the engineering group at the time.

But if there was an equivalent position today, it would be with the transmission group. And I did that for approximately seven years and then started working in rate design and load research and load forecast.

Q.105 - So beyond your engineering degree that you received in 1984, you haven't done any further, what I will call, education at a secondary level, is that correct?

A. I have attended courses in programs related to the work I was doing at the time. I attended extensive course on power system protection in 1989. And I have been on courses at NB Power or provided by NB Power over the years.

Q.106 - Right.

A. Attended conferences, that sort of thing.

Q.107 - Sure. But for example, and I think you even stated this on the record, your particular expertise in the forecasting area doesn't extend to expertise in load research methodology and the use of statistics, is that correct?

A. I guess I'm personally not an expert in statistics or in sampling techniques used for load research. Although I have a member of my staff who is.

Q.108 - Okay. And who would that be?

A. He is -- I'm just trying to think of his current title. He would be the rate design and load research engineer.

Q.109 - And you would supervise the work of the rate design engineer, load research and rate design engineer?

A. Yes, I would, yes.

Q.110 - And he has expertise in the areas of statistics and load research methodology?

A. Yes. He would have worked under and quite closely with the individual who held the position prior to him, who actually did do the sample design for our load research program back in 1993.

And as well he has taken advanced courses in mathematics and in statistics subsequent to his

graduation.

Q.111 - Has he taken any particular courses in the area of load research methodology from any institution or worked with any other utilities prior to coming to work at NB Power?

A. Prior to coming to work with NB Power? No. However, he has attended conferences that would have as part of those conferences specific streams related to load research, would have contained round tables of other load research professionals where they could discuss issues.

Load research in electric utility is, as you can appreciate, a very specialized area. So as far as I know, this is pretty well the only way to get that type of information and that type of training essentially.

Q.112 - And so there would be this individual that is in charge of the rate design and load research that designs the load research programs and the customer surveys. Would that be correct, Mr. Larlee?

A. Not exactly -- again it's important that we would want to separate the customer surveys from load research.

Q.113 - Yes. Fair enough.

A. And you have included both of them in your question. So this particular individual would look after the load research side.

In the past the surveys -- and I assume you are talking about the energy planning survey -- would be designed and performed by the load forecaster and managed by the load forecaster.

Q.114 - In Dr. Jackson's evidence -- and it is not an important point -- but he referred in one of the footnotes to the standard book being a load research manual prepared by the Association of Edison Illuminating Company.

Is that a publication that you are familiar with, Mr. Larlee?

A. Yes, I am.

Q.115 - Thank you. Now just to be quite specific, the staff you would have would be just one person involved with designing the load research program?

A. In the actual sample design, yes. We use -- we have used co-op students out of the UNB engineering program to help us in the past. And then we -- every summer we use summer students to assist us with the field work involved.

Q.116 - So you would be responsible though for the overall preparation of the load forecasting. And you would ensure the proper effort is being done to produce reasonable long-term forecasts with no appreciable bias.

Would that be fair of your role as the person in charge of the load forecasting, Mr. Larlee?

A. Yes. That sounds fair.

Q.117 - Okay. Now I assume you have a budget to do this type of work?

A. My group has a budget, yes.

Q.118 - Okay. And so tell me a little bit. I would like to start off, I take it -- in the business that I worked in for a few years, we were required every year to sit down and lay out a budget of how much money we wanted to spend and what we spent it for.

Is that where you would start each year, Mr. Larlee?

A. Yes. That's the process. Obviously you would look at the previous year's budget. And you look at your long-term needs, any unusual items that are going to appear in the next year.

And as well we would look at any of the strategic initiatives that are being planned by DISCO. And if we are involved in any of them, we would make sure that we incorporated those in as well.

Q.119 - Okay. And you would be I take it in some type of communication with the senior management over some of these special initiatives that might be taking place?

A. Yes, absolutely. I mean, in many of them I'm directly involved.

Q.120 - And would it be also fair that perhaps at certain

points in time you are the originator of some of these special initiatives?

A. Well I don't know if I would want to take full credit for them. These initiatives usually come out of quite a, you know, involved process. The management team gets together and talks about the risks and do a thorough evaluation of where we want to go vis-a-vis the mission and so forth. So I would be involved in that process. Who actually has the Eureka on these initiatives, I wouldn't dare try to take sole credit for those.

Q.121 - You are most modest and there is always team Eureka as well. But going back again, at some point in time you must set out a proposal to management or whoever you report to of the budgetary needs that you would require for the upcoming year, is that correct?

A. Yes.

Q.122 - Yes. And I was wondering, with regard to what you have tried to achieve over the last ten years, would it be possible for you to undertake to provide to us from 1995 to 2005 the budget proposals that you have presented to the management of NB Power?

MR. MORRISON: I'm not sure that's available, but I can check.

A. Some -- probably very few of those proposals would be

documented. I honestly can't say if there would be anything there of any value to bring forward.

Q.123 - I will go with the second part. When I was working in the private sector I a lot of times would put in budgets and things that I would want to be done, but they didn't always get approved. So as a result of this process you would get an approved budget back from senior management, would that be correct, Mr. Larlee?

A. Yes. There is -- at a certain point in time in the planning cycle, there is an approved budget, there is no question about that.

Q.124 - Right. And could you be good enough to advise me whether or not the budgets that have been approved for you over the last ten years would be available and could be produced for this hearing?

MR. MORRISON: Mr. Chairman, I don't know whether they are available or they are not, but I don't know what it has to do with methodology in load forecasting. But perhaps if Mr. Hyslop can show the relevance and we can take a look.

MR. HYSLOP: I would be happy to take that on, Mr. Morrison. I am wanting to determine in view of what is on the record about what has been done since 1995 in terms of customer surveys and load research programs, I would be quite interested to know if the people responsible for

forecasting have been asking for budgetary approval to do more of this work over the last ten years, and that might be found in the presentation of their budgets or other projects they may have been taken on, and yet at the end of the day may or may not have been proved by senior management. I thought an analysis of those two sets of documents might be somewhat useful to us. I think it is relevant.

MR. MORRISON: I don't see what it has to do with methodology. It may be of interest but I don't see what it has to do with methodology, Mr. Chair.

MR. HYSLOP: Well what it has to do with methodology is it goes to the resources that the utility is putting into it.

CHAIRMAN: I guess, Mr. Hyslop, you are looking for the amount of effort that is being put into those areas, is that basically what you are looking for?

MR. HYSLOP: Well I'm hoping so far as Mr. Larlee and his department can document their budget proposals and then be in a position to look at what is actually approved at the end of the day, if we can glean anything out of -- in terms of things that NB Power, at least their senior load forecaster, the person that claims he is responsible -- or concedes that he is responsible for those fields that should be done that may not be getting done, for whatever

reasons brought on by another level of management. I'm just trying to determine if there is something there.

CHAIRMAN: The amount of money that is spent in research and in those areas, is that what you are looking for?

MR. HYSLOP: Essentially I'm looking for what the proposals -- the budget proposals are, what the budgets actually approved might be and what items get cut off along the way.

CHAIRMAN: Would your customer, Mr. Morrison, have some sort of blind budgetary --

MR. MORRISON: I have been advised that there may be some actual budget information, but I don't think there is anything in terms of proposed budgets. I don't think anybody keeps that kind of stuff. There isn't.

When a manager proposes something to the finance people and it doesn't get approved, doesn't get incorporated into the budget, I don't think anybody holds onto the proposal. However, we do have actual budget information, I believe, that we can provide.

CHAIRMAN: Would that be acceptable, Mr. Hyslop?

MR. HYSLOP: I would like if they have -- Mr. Larlee has some of his old records with some of his old proposals in them, I would appreciate receiving those as well. If he doesn't have them and he testifies under oath he doesn't

have them, then I certainly respect that and would accept that as the answer.

CHAIRMAN: Would your client be willing to do that, sir?

MR. MORRISON: It's my understanding that they don't exist, Mr. Chairman, but you can put the question to Mr. Larlee. I don't know -- again I repeat, I don't see what it has to do with load forecasting methodology, but if it's there we will provide it.

CHAIRMAN: Do you understand what Mr. Hyslop is saying?

A. Yes, I think I understand what he is looking for. Basically he wants to do an analysis of what we propose versus what actually gets put into the budget.

I don't really recall of any formal proposal that would have been documented or any informal proposal, for that matter, that would have been documented that I could reach back and pull out and share with the Board. I'm searching my memory now and I really -- I think what we have to understand here is that my budget is primarily people, and that's what makes up the bulk of my budget.

There is -- including myself, there is four of us in the group, plus as I mentioned a summer student or other students that might come into the group. The energy planning survey and capital dollars spent on load research pretty well wraps it up.

I do look after -- under my responsibility is -- as the Board is fully aware, I do look after the rate schedules and policies manual, so there is some money in there for that. But essentially that makes it up.

From time to time I will talk to my manager or to my director and we will discuss, you know, some of the things that are coming up. And I -- as you can appreciate, I will make suggestions that perhaps a new analyst could come into the group and we would benefit from it and we could do certain things. And, you know, those suggestions are either accepted or rejected.

So there is really no formal process where I put out my wish list and have it -- and have it cut back.

Q.125 - You put out a wish list?

A. I said there is no process to do just that.

Q.126 - Have you ever had a wish list, some sort of presentation, we really should make sure we have our load research program undertaken again? Have you ever made that comment as part of the budgetary process, Mr. Larlee, since 1995?

A. Have I ever made the comment that the next logical step to carry forward the load research program is to go to general service? No, I can't say that, I'm sure I mentioned it to more than one manager over the years. But

to say that I put forward a formal proposal during the budget planning process and had it cut, no, that hasn't occurred.

Q.127 - There were a few years where less than a ten year load forecast was completed and I'm trying to recall I think there was even a year or two where there was no load forecast completed. In those years I take it there was no budget for load forecasting in your department, Mr. Larlee?

A. No, that's not the case. The reason -- the reason why we would do a load forecast of less than ten years or wouldn't do a load forecast -- I guess two separate reasons.

One, there was a period of time when the business plan -- the management felt that business planning of five years was adequate. So there was no perceived need to go beyond five years. A lot of it had to do with pending competition. And at that time it was felt that retail competition was literally around the corner. So that's the reason behind some load forecasts being a shorter period.

The years where we didn't have a load forecast we would simply rely on the previous load forecast. If we didn't feel that there was a sufficient reason to go

through the load forecast process, given that things essentially had not changed enough to warrant it, so that we would stay with the existing load forecast.

And there is a third scenario where we would in some years essentially stay with the existing forecast but update it. So do a high level update and basically tweak it again because we felt that that would give us a good forecast without going through the complete bottom up load forecast approach that we are looking at today.

Q.128 - So in the end you make a -- I will say a team judgment call as to the need to do a forecast in a particular year?

A. Yes, that's correct.

Q.129 - In other words, a collective judgment of a group of people?

A. That's correct.

Q.130 - Did you ever disagree with the decision of the group of people and feel that maybe we should do it anyhow, it would be proper, as the person in charge of load forecasting?

A. I don't know if I would use the word disagree. I always make my particular opinion known and then, you know, usually the logic of the situation is obvious and we make the right decision.

Q.131 - Move on to maybe a little area, why it's important to

do, and I am more concerned throughout my cross-examination, Mr. Larlee, with long-term load forecasting as opposed to short-term, and in that regard I understand there is good reasons to do load forecasting, my manual said it, but perhaps you could give me your view as to why it's important to do long-term load forecasting for a utility?

A. Well I mean the primary purpose of the long-term load forecast is to ensure that the requirements -- the electricity requirements of our customers is met. So we need to know that -- we need to know exactly what those requirements are as a first step.

And we laid it out in the evidence on several occasions that at DISCO we follow an integrated resource planning process for a capacity planning purposes. And the very first step in that process is to establish your load forecast. So for the long-term load forecast that really is the primary purpose. So we are looking at making sure we have sufficient -- ultimately you make sure you have sufficient energy requirements and capacity requirements for your long-term needs.

Q.132 - Now I also appreciate there is reasons to do short-term load forecasting, for example, looking at your revenue requirement and your rates and, everyone's

favourite, being able to have some idea when it gets into doing cost allocations and stuff like that. But having said that, the focus -- the focus of your load forecast, how do you go about balancing between the short term and the long term?

A. Well when we do the forecast we are obviously doing a forecast to meet both needs. So when we are looking at year over year growth or when we are looking at any individual class, we make sure that we are getting reasonable results in the short-term and in the long-term. I guess probably the best example of how we make sure that we are treating both with equal weight is in the large industrial forecast. In the large industrial forecast it's a particular situation where because load additions for these customers are going to be large and there is going to be a significant lead time that for the short-term forecast, one year out, we don't include any growth that the econometric model would tell us, because we are -- basically we are saying that any of that growth we will know about. Our account manager will tell us about it. So we include any growth that comes to us by our customer by customer review of these customers.

And then you only start adding growth that our econometric model tells us will come about in year 2 and

beyond. So that we are not double counting. So I think in all the forecast is capturing both long-term and short-term effects.

Q.133 - Is it fair to say that short-term is more important than the long-term or the long-term is more important than the short-term at NB Power in any type of directions you might get with regard to load forecasting?

A. No, I don't think that's fair. Of course it always depends on the user of the information. If I'm talking to the finance department and they are concerned about next years' budget, that's where their focus is. If I'm talking to our planning group and they are concerned about a forecast for the load resources balance because, you know, they are concerned about making sure we have sufficient resources in long-term, then they are concerned about the long-term.

So I think it's my job to make sure that we worry about both aspects of the forecast in developing it and we will let the users of the forecast worry about the areas that concern them.

Q.134 - Do you receive any policy directives or managerial direction with regard to outcomes or methodology to be used in the load forecasting, Mr. Larlee?

A. I'm not sure what you mean by policy directives.

Certainly I have never received any type of direction that, you know, says make the forecast high or make the forecast low. But management does reserve the right to approve and review the forecasts.

And I have come back from those meetings with ideas or with areas of the forecast to look at in more detail. And then returned to management with revised forecasts. But it's not so much policy directive as making sure that we get the benefit of senior management input in the forecast.

I guess the best example of that is -- and I alluded to it earlier -- is the adjustments we made to our forecast that we produced after 911.

When we took that forecast originally up to senior management, they were convinced that there was going to be a serious downturn in the economy, and suggested that there should be an adjustment to the forecast to reflect that.

So we went back. We looked at our assumptions. And we basically said okay, we were using a certain growth in GDP. And we said okay, well, let's have that in the short-term but have the forecast recover in the long-term so that at year 10 there is no change in the forecast.

So basically we put in a short-term effect to account

for this -- what was perceived to be a very real likelihood that the economy would take a nosedive. So it's that sort of input that we get from senior management.

Q.135 - So your load forecasts are adjusted from time to time by senior management or the board of directors, would that be correct?

A. Well, they have their input. I mean, it's not a direct adjustment. But we --

Q.136 - You take their thoughts into account?

A. We have to take their thoughts. And I think that's prudent.

Q.137 - Okay. Now in the actual preparation of the forecast then you would be telling us and telling the Board today that you have a free hand to develop the load forecast using the best information and best analysis possible?

A. Yes. And given my statements I just made, yes.

Q.138 - Now you must examine the results of your forecasts to see how accurate you have been over time?

A. Yes, we do. And there is tables and a graphic in the forecast document that talks to forecast performance.

Q.139 - Okay. And I'm sure as a function of time this is to be expected. But generally in the short term you tend to be more accurate than you would in the long-term. That is

just a function of time?

A. Yes.

Q.140 - Yes. And part of the concern I have here is that it seems to me that at some point in time in these load forecasts what we have got into is a situation where there seems to be a significant consistent inaccuracy in the long-term forecast after four to five years.

In general terms would you agree that my assessment of your information is correct?

A. Well, as you go out into time it becomes more and more difficult to forecast. So yes, as you move farther and farther away and are forecasting farther and farther ahead, the absolute error is more likely to increase.

Q.141 - I would like to introduce a document and ask you some questions about it, Mr. Larlee.

CHAIRMAN: Do you have any objection to this, Mr. Morrison?

MR. MORRISON: No, Mr. Chair. Mr. Hyslop provided me with a copy of it before we started this morning. So I have no objection in him crossing on it.

MR. HYSLOP: On that basis I would ask that it be given an exhibit number, Mr. Chairman.

CHAIRMAN: This will be marked PI-3.

Q.142 - Mr. Larlee, I refer you to exhibit PI-3. And then I just want to start off and make sure I have got a couple

of terms right. Because I'm not a statistician.

But first of all I want to deal with the question of calculation of error. And on the first page, at a particular time, the error can be calculated by examining the actual result against the forecast result.

And we have done that be taking the actual -- and this example is 2768 megawatts, and subtracting from it the forecast of 3313 megawatts. And that would leave a 545 megawatt error.

Would that process be a correct way of establishing the amount of error in a particular forecast, sir?

A. Yes. I mean, that seems okay to me. And using that particular formula, a negative number means the forecast was higher than actual.

Q.143 - Yes. Okay. And I'm glad I got at least that part right.

And the second part of it, if you wanted to calculate the amount of error as a percentage -- and then we have shown a rough formula for doing that -- you take the actual less the forecast and divide it by the actual and multiply it by 100 to get a percentage.

So for the example we had, we have calculated a percentage error of 19.7 percent?

A. Yes. That seems fine.

Q.144 - And again being a negative, that would imply or I guess lead one to conclude that the percentage error here was 19.7 percent over forecast?

A. That the forecast was 19 percent high.

Q.145 - That is correct.

A. Yes.

Q.146 - Now most of these tables have been taken from either the response you gave us in PI load forecast IR-4 which is found in exhibit PI-2.

And looking at the table 1, which is the second page of exhibit PI-3 can you, subject to check, confirm that our calculations with regard to the error -- the actual and the percentage error as we have calculated, would be correct?

A. You are looking at just table 2 or the entire --

Q.147 - Table 1?

A. Just table 1 --

Q.148 - Yes.

A. -- not the entire document?

Q.149 - Yes.

A. Yes. We have had a look at it. And it looks fine.

Q.150 - Okay. And just in that regard -- and I think you have touched on that -- but there were no residential energy forecasts for 1994, '97, '98 and '99.

And I was wondering how you were able to prepare system energy and demand forecast for those years if you had not done a residential energy forecast.

And I guess the question is can you just briefly explain why there were no residential energy forecasts for '94, '97, '98 and '99?

A. Well, I guess it's important to make the distinction there is no forecast prepared in those years. There would have been forecasts either done at a system level, in other words not done on a segment by segment level. Or we would have used forecasts for previous years.

Q.151 - And with regard to figure 1, I have looked through it. And there is the odd number. But would you agree with me that the large preponderance of the error percentages are negative?

A. I -- yes. There are some positive and some negative. But most of them would be negative.

Q.152 - Right. And the preponderance of negative errors, as you have indicated earlier, that would imply overforecasting?

A. Yes. That's correct.

Q.153 - Now again maybe if we just looked over -- or before we go there, the preponderance of negative errors, the fact that there seems to be a very large proportion of negative

errors, would this suggest to you that in the forecasting for the residential energy supply that there would be some bias in the forecasting model statistical bias?

A. I can't say whether there is a statistical bias. I don't believe there is any bias. But what we are seeing here primarily with the fluctuation of these numbers is weather-related.

There is degree day information on the record at an IR posed by the PUB, PUB IR 12. And you will see that in a lot of these, these variances are linked to weather, to warmer than normal weather.

Q.154 - That seems to be some correlation between the weather adjustment and some of these answers. But that's been a judgment call made by NB Power and yourselves. It is not a result of analytical testing of any type is it, Mr. Larlee?

A. Well, I'm not sure what you mean by analytical testing. The fact is that we -- over this period we have had warmer than normal weather, in most years.

Q.155 - Well, I guess just to back up again, if we want to refer to the next page in exhibit PI-3, which is the Residential Annual Energy Forecast Error Percentages depicted as graph lines. Do you have that?

A. So you are looking at figure 1 now?

Q.156 - That is correct. Figure 1.

A. Yes, I have it.

Q.157 - Okay. And correct me if I'm wrong. But every particular forecast, once we get into the third and fourth years, it appears to begin to have a series of negative percentage errors. Do you agree with that, from looking at the graph, Mr. Larlee?

A. As you move towards 2002, 2003 it looks like there is three or four forecasts that are positive. But other than that, yes, they are negative.

Q.158 - And what I'm getting at is in the third and fourth year of all of these forecasts, it appears we start achieving larger negative percentage errors?

A. I don't know if I can agree with that. If you look at the line for 2000, in the third year of that forecast, it's a positive -- positive error. So I'm not sure what you mean by the third and fourth year.

Q.159 - Well, let's take -- we will start with 1992. In the third year we have negative greater than 2 percent in your error?

A. Yes. I see that.

Q.160 - Right. And in the fifth year it falls further negative. And in fact to and including the end of the forecast period we are consistently negative for 1992

forecast, correct?

A. Yes. That's correct.

Q.161 - Right. And if I take for example the 1995, my point is when you hit the third and fourth year of that forecast we seem to be moving in a downward trend, correct?

A. Correct.

Q.162 - And my point is, is it consistently -- for every forecast that has been done since 1992, once we start hitting the third and fourth year of those particular forecasts, with the possible exception of 2001, in the third and fourth year we start spiralling down, and with the result that we seem to be overestimating?

I know it is a bit of a generalization. But I'm trying to look at what this graph, the block of this graph tell us and seeing if you agree.

A. Well, maybe we can come to a consensus if I paraphrase or put it in my own words. But if you look at the forecasts that were prepared in the early to mid '90s, which is 10 years ago plus, they did all tend to overestimate the actuals, yes. I would agree with that.

The variation you are seeing from year to year is being caused by weather effects.

Q.163 - Well, let's go back --

A. You have to remember that these are unadjusted

numbers.

Q.164 - Let's go back to weather effects. You have made that point. And I know you have made it before.

And I guess my question is have you done empirical testing of some sort of the hypothesis that these overestimations of load forecasts are directly due to weather? And are there other factors that would play?

And can you tell me what those factors would be and how much of it is actually weather? Have you done testing of that particular hypothesis to determine whether or not it is correct and the extent is correct, Mr. Larlee?

A. I can tell you what we have done, in that we have --

Q.165 - Well, I'm asking you if you have tested. I'm sure you will get a chance to explain. But first of all have you done testing of that hypothesis to satisfy yourself that your assumption is correct?

A. Well, I guess why I'm hesitating is because if you are using the term test and testing hypothesis in a statistical sense, no. No, we haven't.

But in my own mind I know that we have a significant portion of this load is sensitive to weather. And we have done the analysis to put a magnitude on that and essentially to quantify it. And that is the weather adjustment that we use to bring our data to a

weather-adjusted state.

So we know how sensitive this load is based on historical response to temperature. And we know how that affects the results.

Q.166 - Well, I think what you are telling me is something that might seem to be brutally obvious. If it is a warm winter we don't need as much electricity to heat our homes. And that is a hypothesis. But to what extent? To what extent is the overforecasting attributable just to that factor. Can you tell me from any significant analysis that you have done at NB Power how much that that is actually true? I agree with your assumption. It seems reasonable to me.

What I'm asking is have you studied it and can you tell me how much of it is really due to the weather as a result of some type of empirical testing?

A. Well, the easiest way to do it is to look at weather-adjusted data. You look at weather-adjusted data versus your forecast.

Q.167 - But how does that eliminate other parameters that might cause this result?

A. It doesn't eliminate other parameters. Basically the other parameters are what's left.

Q.168 - Could I refer you to table 4 in exhibit PI 3, Mr.

Larlee. This is a table which establishes the percentage error for industrial transmission actual and future energy supply. And I believe again it was taken from the IR response -- I think the particular PI IR LF-4. Can you subject to check indicate to me whether these calculations would be correct?

A. Yes. We have looked at this table and it looks correct.

Q.169 - Thank you. Now again in this regard there were no industrial energy forecasts in 1994, '97, '98, '99. Would the reason for this be the same reasons you provided to me earlier with regard to the residential forecasts, Mr. Larlee?

A. Yes.

Q.170 - And again could you confirm to me that from I'm looking at the industrial transmission -- or looking at table 4 that again it would appear that the very large preponderance of the percentage errors are negative?

A. Yes, that's correct.

Q.171 - And this would imply that you have over-forecasted the industrial transmission actual and forecast energy supply?

A. Yes, that's correct. I just might add here, it comes back to this point I tried to make earlier, that customers are more forthcoming with load additions than they are

with load reductions or closures. So if there is a tendency for this forecast to go either high or low it will tend to be high because of that very fact. It's very difficult to get information especially out beyond a few years on load reductions.

Q.172 - Didn't you just explain to me though however that you used econometric modelling for the industrial past I think two years out?

A. Yes, that's true.

Q.173 - Thank you.

A. What we do is we actually do two forecasts. We look at the customer by customer, what they are telling us they are going to add, and then we do the econometric model, basically taking the load as it is now and adding a certain amount based on what our regressions had told us, and we will pick the higher of those two models.

Q.174 - So what you just told me, that the over-forecasting in the industrial would not be related to weather adjustments?

A. No, it's not -- it's not weather sensitive load per se.

Q.175 - It's not weather sensitive load. And so the factors that would cause you to be over-estimating in the industrial forecast would be different factors that would

cause you to over-estimate in the residential forecast?

A. Yes, that's correct. Here it's growth -- it's either growth that doesn't appear or it's operations that are ceasing to exist that we had no information on.

Q.176 - And have you taken any type of an analysis to confirm what you just told me or is what you have just told me a result of just the analysis of yourself and other senior people at NB Power? Have you tested again the statement that this over-forcasting has occurred because people didn't give you the right long term uses of electricity they anticipated?

A. That is in fact what is happening. I'm not sure it's something that can or needs to be tested. Because there are in the order of 40 customers in this class, basically we can tell what is going on and adjust for specific customer operations.

Q.177 - Would it be fair to say then that at NB Power you would have or might have reports each year that would explain the variances from forecast with regard to the industrial transmission energy forecast?

A. No, I don't think that would be fair to say. We operate on a quarterly basis, so every quarter as we move forward we would update that year's budget for anything that happened in the quarter.

But to say that there is an annual check -- or a report to give us an annual check, no, I don't -- there isn't.

Q.178 - So your conclusions then that the over-estimation of industrial forecast is due to the fact that some of the customers haven't used the electricity that you thought they would, again that's founded more in your own analysis as opposed to saying, you know, we expected customer so-and-so to use 20,000 megawatt hours but they only used 17,000. There is no analysis like that that would explain these errors?

A. There is analysis. I mean, we have reports that would show how much we budgeted for an individual customer, and at the end of the year you would get the year to date actuals, and it would show how much they actually consumed.

When we would go and do the next forecast that print-out essentially would be part of the information we would have when we sit down with the account managers, and we would ask them, okay, what happened last year, why was this customer below budget? They would tell us why and they would tell us either why they think that that's going to continue on into the future or why it's not going to continue on in the future, and why or why not we should

use last year's number or a different number on a go forward basis.

So that's -- you know, that's how the process works, both as part of reviewing the previous year's actuals and producing the next forecast.

Q.179 - I would ask if you would turn up tables 5 and 6, both of which are found in exhibit PI 3? And I believe also these are the same tables that were produced on tables 16 and 17 of the load forecast which is part I guess of exhibit A-4.

A. Yes, I have that. And I am just referring to the load forecast document which was in A-4. I see that you have added two more years to the bottom of the chart.

Q.180 - Yes. Thank you. And again subject to check, are the numbers we have produced here in terms of the actual and forecast -- do they appear to be accurate, Mr. Larlee?

A. Yes.

Q.181 - Okay. And the assessment of percentage error that we have calculated, again we would suggest to you that the preponderance of the results would suggest over-forecasting?

A. Yes, that's right.

Q.182 - And if I also take a look at table 6, this deals with demand as opposed to energy?

A. Yes, I see that.

Q.183 - And would you agree with me again that in terms of your forecasting of peak demand that it would appear that throughout this period you have generally been over-estimating the actual peak demand that resulted? Your forecast was in excess of the actual?

A. Yes. There is a mix of positive and negative numbers, but if you were to count them up -- I mean, you would find more negative numbers.

Q.184 - Sure. Now just for my information, and the way I understand this is if you are doing forecasting that is reasonably accurate in the long run, there would be some years you would be over and some years you would be under, so that you kind of come close to the zero mark in percentage error. That would be a sign of accurate forecasting, would it not, Mr. Larlee?

A. Perhaps statistically it would be, but I don't see the value in looking back at your previous without figuring out to some degree why it is so, and just purposely biasing your forecasts in order to bring the line back above zero. I mean, what we are trying to do is on a go forward basis produce the best forecast that we can.

Q.185 - And the point I would make is that for most of these years I would assume you were trying to produce the best

forecast that you could?

A. Yes, that's right.

Q.186 - But in the actual results looking back we seem to have a consistent -- or I would say a predominantly consistent pattern of over-forecasting. My question is, why wouldn't you make the adjustments in your forecasting methodology to correct those results?

A. Well let's take a look at some of them. If we go to table 6, and you look at the forecasts produced in -- or we can start in 2001.

You can see that those forecasts are low or very close to actual, except for '05/'06. In '05/'06 was a particularly unusual year for two reasons. 1) it was a very warm year and 2) we had two significant -- at least two significant industrial reductions. So I think when you are looking at the forecast in recent times, particularly since 2001, which is the last time the Board reviewed the forecast, certainly looking at the demand numbers we have got quite good performance.

Q.187 - Well I want to go back to one of my prefacing remarks, Mr. Larlee. I'm not taking particular issue with your short term forecasting. I have been wanting to concentrate on the longer term and I -- you may or may not be proven correct with regard to your 2001 forecast

because we won't know until 2011 how accurate you were with that.

But I'm suggesting in the longer term forecasting if you consistently see some of the patterns that develop in the long term, why wouldn't you be making adjustments to ensure a higher level of accuracy in the long term of your forecasting?

A. Well if we are going to make adjustments to the forecast we have to have a good reason to make it. We can't just simply make the adjustment because it looks as though last year's or the forecast ten years ago wasn't performing well.

I think we have got to keep it in perspective that, yes, it's important to have a long term forecast for planning reasons, but as you get closer and closer to actually needing capacity when that threshold is reached this is when -- you know, you reach that period where you have got to decide whether you are going to build, buy or invoke a DSM program, then that's the critical timeline. And that timeline is, you know, somewhere between three and six years before the event.

So yes, a ten year forecast is important, but I'm not sure how you would weigh the relevance of that versus the three, four and five years. But it's important to get the

mid term right as well.

Q.188 - So just to go back, would it be fair to say then as a general forecasting policy the need for higher comfort level of accuracy is certainly in the shorter as opposed to the longer term?

A. Well I think it only makes sense that you should be more accurate closer, and you should be prepared to accept more variance farther out in time.

And I think everyone accepts that with the forecast, that, you know, if you are within one percent in one year and you are within ten percent in ten years you are averaging about one percent a year, and that's -- you know, people can work with that.

Q.189 - Of course there were some years your ten years was out 19.7 percent?

A. Yes. And some years they are much better than that as well. And another point that perhaps should be made is that we do do a forecast every year. So it's perhaps a little bit unfair to look at particular years. In our analysis what we tend to do is we tend to average the forecast. So we will look at well, how is the 10-year forecast done?

So we would average, you know, as many 10-year forecast results as we can look at, and then average how

have they done nine years out, and this sort of thing. So you can average out some of those results.

And when we do that we get numbers in the order of what I just said. And I didn't pull that number out of the air about one percent a year.

Q.190 - Do you have those records?

A. I believe all of the information to do that analysis is on the record. But the results of the analysis we have, we can share it if --

Q.191 - Look, I'm not trying to smoke anybody. But if you have it could you file it with the Board?

A. Yes, certainly.

MR. MORRISON: That is an undertaking, Mr. Chairman. I believe we have the information.

CHAIRMAN: Okay. Thank you.

Q.192 - Now you talk about load research programs and --

A. Excuse me, Mr. Hyslop. Are you moving away from --

Q.193 - Yes. I'm moving away from the --

A. Could I just make one observation on the very last page?

Q.194 - Well, sure.

A. It's just if you --

Q.195 - One of my lines is wrong.

A. One of your lines is wrong.

Q.196 - Yes.

A. I just wanted to make sure that it was picked up by everyone. And that is the yellow line which is 1994.

Q.197 - Yes.

A. It should end -- it should end in '03/'04.

Q.198 - Yes.

A. It shouldn't continue on to '05/'06. That's all.

Q.199 - That is correct. I think that is why it slid along the zero.

A. Yes. It looked odd and caught my attention.

Q.200 - Right. Just before I go on, in your response to DISCO PI, load forecast IR-1 on page 3, you made the statement "It is anticipated that the entire sample will be replaced with modern load profile technology." Do you recall that statement, Mr. Larlee?

A. Yes, I do.

Q.201 - Okay. So my question is what is modern load profile technology?

A. Well, I am an engineer. So are you sure you want to hear this?

Q.202 - My concern might be that nobody else would want to hear it. No. I see Commissioner Mr. Sollows waving his hand. So we will put you through it. But do give us the layman's version if you would.

A. We installed the meters in on the load research sample in 1993, 1994. And it's actually a two-part device. So there is a meter looks similar to any meter that you have in your house, with the spinning wheel and the whole works. And then there is the actual recorder itself that records the 15-minute data plugged in behind.

With the development and the increase in technology we can now buy that entire package under -- what we would call under the glass, in other words it looks like a normal meter, only it's an electronic meter, there is no moving parts -- for about half the price.

So we essentially -- and we have done it actually since I made that response. We have switched out all of the meters for these under the glass type units. And those are all in place today.

Q.203 - Right. And that answers my second question, when? And I guess the budgetary approvals have been given for doing this?

A. Yes. That's correct.

Q.204 - Okay. And --

A. We actually -- in my department I carry a certain amount of capital budget dollars, just the sole purpose to maintain these meters and computer software and so forth.

Q.205 - Now we were talking between 200 and 250 of these

meters for the residential class I believe?

A. Yes. I think we have got 190 in place now.

Q.206 - And this would have been the load research proposal that you were discussing during the CARD hearing a year ago, that you hoped to have put in place during 2006, is that correct?

A. Yes. That's right. We are talking specifically about changing out the meters for the residential load research program.

Q.207 - And when would you expect to start receiving sufficient data to analyze and prepare a report? Just take me through the rest of the time line that we are going to be dealing with when this modern load profile technology was going to start producing some results for us, Mr. Larlee?

A. Well, there essentially has been no interruption in data flow. So as the old meters were removed they were read. Or right before they were removed they were read. And then the new meters go on. So that the data continues to flow into our software package that holds the data. That software package basically converts a count of electronic pulses into kilowatt-hours, into something usable. And then it's held there until the analyst can go in and validate it and verify that it's all making sense.

We usually hold that work until the summertime and have a summer student do as much of that work as we possibly can. The summer student also does any field work that's required.

If we have meters that are giving us problems out in the field they will go out and extract any data off them prior to them being changed out or fixed. Sometimes they can be fixed right there in the field depending on what the problem is. Then the real work or the most time-consuming work then is doing the analysis.

So as you can appreciate, we are looking at somewhere in the order of 200 customers that are intended to represent the entire residential population. So they are intended to represent a population approaching 300,000 customers. So in order for that estimate to be valid, the right kind of analysis has to be done and the proper analysis has to be done. We call it totalization. So essentially we are not interested in the results of individual customers. We are interested in the results of groups of customers added up and then being properly weighted based on what the sample design told us they should be, and then adding those all up to get an estimate of what the average

customer is taking at time of peak.

And then we carry it the next step. And we would actually expand that to give us an estimate of what the total class would be, the total residential class at time of peak. So are they, you know, drawing 1000 megawatts? Are they drawing 1500 megawatts? You know, the real answer is somewhere in between.

So doing that analysis is -- like I said, it's quite time-consuming. And usually we would do it as part of getting ready to do a cost allocation study. And the last time we did it was to get ready for the rate case and the cost allocation study we prepared for that.

Q.208 - So we are about a couple of years out before we get the results of this new modern technology that you are using to do these load profilings for the residential sector?

A. Well, before I would have the resources to do the work I just described would be in the summer, assuming we get the same summer student back, so we don't have to retrain a summer student.

You know, this is something that we could hopefully have done by the end of summer 2007. Basically it's a process of updating the analysis. And I mean, we have filed tables, and they are on the record, of what our

results have been so far. And we add another two years to those results.

So this idea of changing the meters with modern meters isn't -- this isn't a revolutionary change to the program. It's basically a question of maintaining the program, keeping it going.

Q.209 - Now the purpose of the load research, aside short term, it also assists in the development of load forecast. Would I be correct in that regard, Mr. Larlee?

A. No. I tried to make it clear before that we don't --

Q.210 - No, no.

A. -- we don't use the load research data in the load forecast.

Q.211 - I appreciate that. But wouldn't it be -- isn't it a useful tool in doing load forecast? Could it not be used as a useful tool?

A. I guess the best way to answer that is to explain why we haven't used it for load forecasting. And that is because we are looking at the residential load in isolation. The process by which a utility would -- I guess there is one added way we could verify those numbers, which we can't do at DISCO right now. And that is if we could close the loop, in other words if we could look at

residential -- look at all the classes, add them up.

And if the profiles for all the classes add up to the system total which we have, because we can get that from NBSO, then we are confident that our results are all -- that are good. We are missing a piece of that puzzle. We don't have the General Service Class load profile because we don't have a load research program in that class.

We have large industry, because essentially -- effectively all of those customers have profile meters on them now.

We have residential because we have a program. We don't have General Service or Small Industrial. So that's really the next step.

And I hope I'm not straying too far off topic here. But I'm encouraged with some of things I'm seeing in smart metering, that if we can show that smart metering really has a lot of benefits, this being one of them, then we should be able to implement a General Service load research program very cost-effectively.

So that's the reason why we are not using the residential results for load forecast.

Q.212 - Well, look, my question was is load research information useful in load forecasting? And earlier in my cross examination I asked if you were familiar with a publication Load Research Manual, Second Edition, produced

by the Association of Edison Illuminating Companies. And you told me that you were.

And in that, and I'm reading it from page 1-5 under "Uses for Load Research Results." It indicates demand and energy in forecasting. I want to read this to you and ask if you agree or disagree.

"Load research studies are becoming increasingly important in developing databases for forecasting. Load research data combined with customer demographic data provides forecaster with the information required to produce accurate annual energy demand forecasts. In competitive markets accurate day ahead forecasts and day after backcasts for individual supplier aggregates are important for retail suppliers and overall system operations. Accurate short-term forecasts are critical to a supplier's ability to serve today's customers. Accurate long-term forecasts are critical to a utility and a retail supplier ability to meet electrical usage requirements for tomorrow's customers."

So on the basis of this statement would you agree or disagree with the thoughts of the Association of Edison Illuminating Companies that load research is important in load forecasting?

A. Well, I think it can be useful to load forecast. I'm

not denying that. I guess I was speaking from DISCO's case, that because were are missing that piece of the puzzle, I wouldn't feel comfortable inserting the residential results into the forecast without having the General Service piece.

And frankly without the General Service piece it wouldn't be very useful. Because of the way we do the demand forecast, right now we do the demand forecast at the substation level. I'm talking about the peak hour forecast now.

So if we wanted to go down to the next level, go down to the customer class, we need information on each class. Just having one piece doesn't give us all that information.

Q.213 - And I appreciate that. So I take it then in your next budget proposal you will be asking for sufficient funds to the General Service load research. Would that be a fair statement, Mr. Larlee?

A. Well, I can't say that for sure. I think the way we do the forecast now, the demand forecast at the substation level is it works. We use good quality data, historical data that we are getting from the substations. It doesn't allow us to segment any of the customer classes. But it does give us a reasonably good demand forecast.

Obviously an expansion in load research would definitely, you know, be a positive thing. It's certainly not a negative thing. It's all a question of where we put our resources as a company.

Q.214 - Well, let's move on a little bit with resources that are used in load research and load forecasting. And in our --

CHAIRMAN: Mr. Hyslop, are you going on to a new line of questioning?

MR. HYSLOP: Yes. It is a good time to break if that is what you think.

CHAIRMAN: Yes. It might be.

MR. HYSLOP: Yes.

CHAIRMAN: Okay. Why don't we break for 10 minutes.

MR. HYSLOP: Thank you, Mr. Chair.

(Recess - 2:35 p.m. - 2:45 p.m.)

CHAIRMAN: Mr. Hyslop, do you want to carry on?

MR. HYSLOP: Thank you, Mr. Chair.

Q.215 - Mr. Larlee, when we left off before the break, we were talking about the cost of doing a load research program. And referring basically to the answer you gave us in it would be in exhibit PI-2. And it would be the answer to load forecast IR-2. And I think you indicated it would be somewhere between 200 and $300,000 to complete a load

research program.

Is that correct?

A. Are you looking at IR-2 November 1, 2006?

Q.216 - Yes, I am.

A. No. Our estimate was in the order of 600,000 plus.

Q.217 - Yes. But I am speaking per year, the 200,000, you had estimated that over three years?

A. Yes. There is some up-front costs and then there would be some running costs. Over three years we came to 600, so okay.

Q.218 - Yes, I apologize. I think we are on the same wavelength.

A. Right.

Q.219 - If we said 2 to $300,000 a year and that might have to run three years or our years to do it, then we would be about on the same wavelength.

A. That's right. I mean, the numbers are very sensitive to what you want to do with the load research program. So these numbers that I have provided are at a class level so general service I, general service II, and then that is it, not drilling down any further than that.

Q.220 - Okay.

A. And then there would also be depending on the precision level you want to achieve, you want to achieve 5

percent accuracy 19 times out of 20, or do you want to choose something different. That could affect the number of meters that you need.

Q.221 - Right. And for the record, and I will let Dr. Jackson speak for himself, but I think he indicated he thought your budget was a little high. But we will both get a chance to ask him about that.

So the revenues of NB Power in 2006/2007 were -- I am going to ballpark -- expected to be about $1.3 billion, give or take a billion or a hundred million one way or the other.

A. Yes. I mean, I don't have those numbers in my head. But it's in that order of magnitude certainly.

Q.222 - Sure. And I have done the calculation and maybe you can do it because you are maybe better at numbers but I have calculated that the comprehensive load research program in a particular year might represent .015 to .025 of 1 percent of the utility's revenue requirement. Subject to check, would you agree that that might be a fair statement?

A. It sounds like it is probably the right calculation. I'm not sure it's a fair statement because certainly we all know that the revenue requirement includes the cost of energy, DISCO's budget is a much smaller number. So --

but I mean, the calculation sounds right.

Q.223 - Okay. Well within the concept of NB Power then as opposed to just DISCO. And again by my calculations, I have calculated that the resources to do a proper load research would be between 1 and a half and 2 and a half cents for every hundred dollars of revenue.

Just again, I am speaking pretty rough numbers because I did these pretty roughly. Would you agree with that as a general statement, Mr. Larlee?

A. Subject to check, I will agree to that.

Q.224 - Okay. Subject to check, fair enough.

A. These are -- these are controllable costs. Any increase that I would put forward is a controllable cost whereas we know from the revenue requirement hearing, a large portion of the NB Power group of companies' costs are not controllably.

Q.225 - Okay. And within that point in time, to be controllable, might be fair to say sometimes you like a little more money and sometimes senior management like to give you a little less, where it is controllable? Or is that just something you kind of work out in your team environment?

A. I mean, it is -- we are constantly talking about what we can do and what the priorities are and what -- you

know, what our plans are. And sometimes my ideas are accepted and sometimes they aren't but I always manage to see the light, I guess.

Q.226 - Would that be see the light or accept the light, Mr. Larlee? Regardless, I want to move on to another topic and subject to check, I think my numbers are close there. I am going to touch on a few things that were talked about by Mr. Coon this morning. But I will try to shorten up some of my line of questioning.

But what do you understand to be demand side management, Mr. Larlee?

A. Well I believe we answered an IR to that very question.

Q.227 - Yes.

A. Let's see if I can bring it up here. PI IR-6.

Q.228 - Yes.

A. In the same reference you just gave which is the response to IRs November 1. To summarize, really DSM is one of the options you look at when you are looking at meeting the requirements of the utility. And it is a combination -- it is a very broad -- very broad topic in that it basically includes any measure that reduces the utility's requirement, whether it be energy requirement or demand requirement.

But it is an active -- essentially an active intervention in the market.

Q.229 - Right.

A. To reduce the utility's demand. Obviously the utility has a choice. It can build capacity, put concrete in the ground to meet that demand or it can encourage its customers to reduce its demand. So DSM encompasses any and all measures related to that.

Q.230 - Okay. And those are the measures that are directed to people reducing the amount of electricity or when they consume the electricity.

A. Yes. I mean, and the key point of when is reducing it on the peak hour.

Q.231 - Sure.

A. Because the utility has to have enough capacity on hand to meet that peak hour demand and any reserves that the proper authorities have deemed are necessary to hold as well.

Q.232 - And this morning, my colleague, Mr. Coon, asked questions dealing with some aspects of energy efficiency. Is that a little different concept than demand side management?

A. Yes. It's different in a sense that energy efficiency would be included in demand side management measures. You

can encourage customers to use the electricity more efficiently then that would be an energy efficiency measure.

Q.233 - Yes.

A. For instance, rebates on compact fluorescent lightbulbs or -- that would be an energy efficient measure. The customer is still getting the light, they are still using the electricity, they are using it more efficiently. Using less electricity to essentially get the same service.

Q.234 - Okay. And I think in the evidence we filed, the PI filed, I think Mr. Olson indicated energy efficiency is kind of a subset of demand side management. Would you agree with that statement?

A. Yes, I agree with that.

Q.235 - Okay. Now my question goes to your long-term forecasting and a little bit in terms of flexibility. I want to know. But as I understand it right now, the way you incorporate DSM into your programs is you are making adjustments in the long-term for the demand side management you see as occurring based on certain facts that exist today. Is that correct?

A. No. I wouldn't --

Q.236 - Okay.

A. -- characterize it as that. I guess what we have in the forecast is what we believe is going to occur without any additional intervention or any intervention into the marketplace.

Q.237 - That is where I was going. Maybe I should have asked the question.

A. Right.

Q.238 - So in other words, if in the future there were other factors that came into the marketplace, say an increased government program, how easy or difficult is it for you to make adjustments to the load forecast to incorporate those type of changes?

A. Well we have done it before. We have adjusted for active demand side management programs before and actually it is on the record filed as part of the previously filed evidence in response to an IR by the PUB, we included some of the sheets from the model. I believe it was the 1993 forecast. Where we put in line items for each active demand side program at the time.

Examples of which are the R2000 program where we were giving rebates to customers who constructed R2000 homes and pipe wrap and there were several other programs at the time.

So there is no question it can be done and be an

adjustment to the existing model.

Q.239 - Okay. And this goes to the load forecasting itself. It is part of the adjustments. If there were changes it would change the load forecast that you would be using independent of any integrated resource plan. Correct?

A. Yes. Because once you have your demand side management program in place, now you have affected the load forecast. So once it is in place, then you would put those specific measures into your load forecast and you are basically assuming that those measures make a permanent change to the market and you would project that forward.

So the next time you did -- went through your IRP process, you would look as part of your integration, you would be -- they would be looking at new programs. Programs they would add on top of ones that had been included before.

Q.240 - Now as terms of demand side management, the question I have is do you conduct or regularly investigate different scenarios or do a sensitivity analysis to determine the effect of different types of demand side management on your present load forecasts and prepare or provide that sensitivity analysis to management?

Is that part of your load forecasting role?

A. No, it isn't. What was done the last time the IRP was completed is we provided the base forecast and in the integration process so after the demand side management screening was done and the evaluation was done, in the integration of the demand side management supply measures, they did a sensitivity on the demand side management measures.

So it wasn't done in the forecast, but there was a sensitivity done as part of the integration process.

Q.241 - Would it possible to do that type of sensitivity within the context of a load forecast? And if -- the answer to that may be yes, but I am also interested you know, what type of trouble it causes and what type of effort you would have to go through. It is not a loaded question.

A. Well, you know, whenever I hear is it possible, the answer is always yes, right.

Q.242 - Okay.

A. Again, my engineer is coming out, but anything is possible given enough time and money. But it makes sense that it be done in the integration process because the demand side measure eval -- screening and evaluation isn't done by people in my group. It is done by people who are familiar with DSM, DSM programs and are very familiar with

the technologies.

And those planners are I think better suited to look at what reasonable sensitivities are around possible DSM measures. So I think it makes sense from my point of view that it be part of the IRP process or part of the integration.

Q.243 - Sure. Are these people that would analyze this be people at NB Power that work for you?

A. The last two IRPs I believe were done inhouse. So they had -- as a foundation they had analysis that was done by external consultants. Then they built on that and did it inhouse.

It is a very time consuming process and very intensive. I mean, they basically were locked away in a room for four to six months and by the time they were done the room was full of documentation.

I mean, to look at all these measures and evaluate them from a sound engineering perspective is quite an endeavour.

Q.244 - When you investigate something from a sound engineering perspective, you are approaching it, I assume, from the -- I am going to use a phrase here. I am not sure if it's right. But the pure economics of whether it makes sense economically? Would that be what you are

alluding to, Mr. Larlee?

A. Well even before you reach that point, I mean you have to screen and evaluate these measures that have to be quantified. Everything has to be quantified before they are even looked at economically. So I guess I am -- when I talk about looking at them from a sound engineering perspective, I haven't even reached the economic evaluation stage yet.

Q.245 - Now in addition to what I am going to call the sound engineering and sound economics, I understand that there are people concerned with things like climate change and environment and that could skew the results in terms of screening so that something that wouldn't be useful from a pure economic point of view might be used because of intervention of government policy or by regulatory direction?

Would that adjust results, make other -- some parts of energy efficiency or demand side management more likely?

A. Well I refer back to the last IRP we did. The very sensitivity that I was talking about was a sensitivity on CO2 reduction. So as a value placed on CO2 reduction, how would that impact?

So you know, what you are talking about is -- these are real possibilities so it was accounted for through the

sensitivity analysis.

Q.246 - And as these things came up in the real world, you would be able to factor them into your load forecasting?

A. Yes, that's correct.

Q.247 - This may be outside of your expertise and if so I perhaps ask it. Would DSM activities have the potential or have the possibility of negatively affecting the utility's net income?

A. Yes. In the short-term even successful DSM programs often have short-term negative net income impacts. So that really to evaluate them, they have to be looked at over the long-term. In many jurisdictions you have some sort of mechanism to keep the utility whole essentially in the short-term. So that basically the utility isn't penalized and doesn't have a disincentive to pursue a DSM program in the short-term so that everyone can gain from the long-term benefits.

Q.248 - I refer to Public Intervenor's pre-filed evidence which is PI-1. I will find the page number -- yes, at page 12.

And Witness Olson in his pre-filed evidence has asked the question, do utilities have disincentives to pursuing DSM and DR, and he indicated yes, unless adjustments are made to remove the utility's incentive to sell more

kilowatt hours to customers. On traditional rate of return rate base regulation a utility will strive to sell more kilowatt hours of electricity.

I think in view of the answer you just gave you tend to agree with the PI witness on that point, Mr. Larlee?

A. I agree generally. It's a little less emphatic than I would be, because I think if you looked hard enough you could find measures where it's win/win, and if I recall correctly we had found those in the past. And a good one is compact -- I think it's compact fluorescent light Bulbs, essentially that -- it helps the customer to such a degree that it doesn't require any incentive but it's a very good idea. And the reason being is that not only do they use less energy, but they last so much longer that candescent light bulbs -- regular candescent light bulbs -- that it makes sense for the customer.

And here is the type of measure that doesn't require any kind of incentive because it makes so much sense, and so we don't have an active program related to it, but at the same time we are working at the national level to -- on a recommendation with the Canadian Electricity Association, that the government essentially ban incandescent light bulbs at a certain period of time out into the future.

Q.249 - NB Power is not giving them away the way Saint John Energy was?

A. No. No, there is no need to because they are such a good idea for customers.

Q.250 - Okay. With respect to -- going on just a little further with this. The disincentives that come out of demand side management for utilities, you have indicated that in some jurisdictions things are done to make them whole, and the witness again -- witness Olson -- has indicated some of these things. Have you had a chance to review those, Mr. Larlee?

I'm not going to go into them. I'm just saying do you agree with the principle that if there is disincentives through -- if there are disincentives to utilities using DSM there are ways of compensating the utility?

A. Yes, there are, under the regulated utility model.

Q.251 - Yes. Thank you. Now looking at DISCO PI load forecast IR-6. In that you made the statement, as new DSM programs are introduced which will include energy efficiency measures, they will be included in the load forecast. That was part of your response, Mr. Larlee?

A. I remember writing it and I can't actually see it. Is it IR-6?

Q.252 - It's IR-6.

A. I will agree with you. I can't seem to find it but I do remember writing it.

Q.253 - Well maybe I have the wrong one. But my question arising from that, would you be good enough to tell me what adjustments have been made to the load forecast as a result of NB Energy Efficiency Corporation and the $11,000,000 budget that they will be using in the foreseeable future. Have you made any as a result of that at this time?

A. As I mentioned to Mr. Coon earlier, we felt that the adjustments we had in the forecast for efficiency and conservation would be adequate to cover what we -- or what Efficiency New Brunswick was working on. Or -- yes. They weren't even in place at the time this forecast was prepared, but at this point in time -- what they are working on at this point in time we would stick with the adjustments that we have in place now.

As they develop their targets and develop their programs more we will look at them on a one-on-one basis and put them into the forecast.

Q.254 - Now when you have made the decision at this point in time that what you have there properly incorporates whatever Energy Efficiency New Brunswick is doing at the present time, that is a result of a professional judgment,

an analysis as opposed to empirical study or investigation?

A. Well unfortunately as I mentioned earlier we are not -- we don't have numbers, we are not getting numbers from Efficiency New Brunswick at this time. So essentially we have had to use our judgment to say that we feel we have got it covered.

And I think, you know, the report that was commissioned by the Board back in 2001 indicated that we were over-compensating for DSM at the time. Obviously we have fine-tuned our adjustments since then. But I think that in fact we do have those efficiencies well represented in the load forecast.

Q.255 - And in saying that, you are saying that based on your professional judgment having --

A. Unfortunately, yes. That's what we -- I shouldn't say unfortunately, but that's all we have to go on at this point.

Q.256 - Now I don't want to beat this to death because my colleague did cover some of it quite well. But in pre-filed evidence Mr. Olson said, it appears NB Power accounts for its estimated energy capacity reductions that would naturally occur but not for energy capacity savings that could result if it were to more actively pursue DSM

DR programs.

Would you agree that at the present time your estimation of energy capacity reductions are based on what you feel is going to naturally occur?

A. Yes.

Q.257 - And there is no adjustment or any type of allowance for any type of potential or programs that might be instituted in the future in your forecast at the present time?

A. No. I mean, I can't in good conscience just put in a program based on speculation. DSM is a big area. There is a lot being written about it now. And I think it's utility practice to make sure that the DSM programs are, you know, effective and measurable and verifiable. So when we have programs I think that meet the industry practice, then we will include them in the load forecast.

Q.258 - And the reason I ask that question is just to ask a hypothetical, Mr. Larlee. And let's assume if we did for a moment that the government or a great benefactor decided that to reduce energy consumption we would take $30,000,000 a year and apply it to energy efficiency, and then decided that in three years all rate classes would pay 100 percent of their cost, proper price signals as it were.

How would something like this affect the load forecast both short-term and long-term, and how much trouble would it be to do a forecast based on that set of parameters?

A. Well I think the forecast we have now is capable of handling those input assumptions. If the programs -- if there is programs in place, DSM programs in place, we would include them in the forecast with the assumptions that would come along with those programs.

If prices change as per the Board's own recommendation we have the ability in the forecast to adjust for the effects of price elasticity. So it's well within the capabilities of the model to include those types of inputs.

Q.259 - Now the question I have, it's well within the capability of the model, but what type of process would you have to go through to print us a scenario of what your load forecast would be -- would look like on those parameters?

If I said, could you undertake to provide that in a week or a month, am I asking too much or too little, or -- like I'm trying to find out what it would take to complete a load forecast with those type of inputs. And I don't want to blow your budget either.

A. Well I think to do it justice you have to do a series

of scenarios and you would want to do -- and you would have to work the model to include those -- to include those adjustments, and to do it properly. I mean we are not talking about a few hours or -- we are talking about several weeks work, I would say.

Q.260 - I'm afraid that's what I was afraid of. But in any event, it is possible for it to be done given different parameters if they were supplied to you within the forecasting model that you have at this time?

A. Based on what you told me, yes.

Q.261 - Thank you. My last line of questioning, and I do so at some consternation because I was -- I might be taking a risk, but I found several examples of this in the transcript. And I thought I would use the quotation from Mr. Rock Marois of the Telegraph Journal on Tuesday, October 31st, 2006, and I will get to the question. The headline -- and by the way we note that it is Halloween, I don't know if that makes any difference, but -- NB Power Awash in Red Ink, finances senior exec. says if politicians --

MR. MORRISON: Mr. Chairman --

MR. HYSLOP: I have got a question. It's a legitimate question, Mr. Morrison.

Q.262 - It says, politicians allow utility to charge right

prices for electricity consumers would reduce usage. And Mr. Marois -- I assume Mr. Marois is the person that I believe has appeared many times here -- Mr. Marois says, if we were charging the right price for electricity let me tell you that people would be thinking -- change to page 8 -- more about reducing their consumption.

Would you generally agree with Mr. Marois on that point, Mr. Larlee?

A. Well in the revenue requirement and rate design hearing we talked a lot about price signal --

Q.263 - Yes.

A. -- and I'm sure we don't want to rehash that here. But you send the right price signal and customers are going to be more likely to use your product efficiently, that is use it when it's of value and not use it when it is not of value. So, you know, I can't disagree with it. And we have price elasticity in the load forecast model.

Q.264 - And again within the load forecast model, if the scenario were painted to use a certain type of rate design or a certain set of rates, I take it we would be looking at this three or four month type of analysis to determine what the long-term forecast and as well as the short-term forecast may be impacted, would that be correct?

A. I take it you are referring to changing the rate

structure and flattening the rate, is that correct?

Q.265 - Yes. Well I'm just saying generally, if you go with -- well let's say if the Board's decision of June 26th were incorporated, would it be possible for you to complete a load forecast showing the energy consumption and demand in the future using that set of rates and rate design?

A. Again, it would be possible. The approach I would take specifically to look at the issue of flattening the rate is I would want to look at how the competing fuels, especially for water heating and space heating, how that would affect the relative position of those competing fuels.

In the previously filed evidence there is an analysis that basically where we have gone in the past and looked at how electric heat stacks up against all of the competing fuels. That analysis would have to be redone, and then we would want to take a detailed look at our electric heat penetration and natural gas assumptions and see if they needed to be altered.

I guess the other thing we would also want to look at is we would want to look at how the penetration of natural gas is proceeding and if we could make any assumptions about how that would change as a result of price changes. I would try and talk with Enbridge and see what their

assumptions are. So, you know, it would -- I guess I would delve into that in a little bit more detail than I normally would when developing the forecast because of that particular -- that particular change.

Q.266 - This is the last question. Other than management and this Board, are there any other parties you provide short or long-term load forecasting for, Mr. Larlee?

A. You say provide for. You mean provide copies to --

Q.267 - Yes.

A. -- or provide information from the forecast to?

Q.268 - Or provide forecasting for their use. I'm think specifically of the department of energy or another government body?

A. Well obviously the NBSO. The NBSO under Market Rules we are required to provide them a long-term forecast in January of every year, and short-term 18 month forecasts every 18 months -- every quarter, sorry. And as well there is an organization called NERC which is essentially a reliability organization for the electricity system. So we would provide information on our forecast to them as well for reliability purposes.

MR. HYSLOP: Thank you. Thank you, Mr. Larlee. As always I appreciate your candid answers to my questions.

MR. LARLEE: My pleasure. Thank you.

CHAIRMAN: Thank you, Mr. Hyslop. We will take a 10-minute recess while the Board Staff gets ready to ask their questions of Mr. Larlee. And also he has been on the stand for four hours, so he does need a break every once in awhile I think. So we will take a five, 10-minute break.

WITNESS: Thank you.

(Recess- 3:20 p.m. to 3:30 p.m.)

CHAIRMAN: Thank you. Are we ready to resume, Ms. Desmond?

CROSS-EXAMINATION BY MS. DESMOND:

Q.269 - Mr. Larlee, can I bring your attention to the Forward in your document, the load forecast, page 1?

A. Yes, I have that.

Q.270 - And in your Forward you identify that the forecast results can be used for a number of purposes?

A. Yes.

Q.271 - And is it reasonable to say that any improvement in your load forecast methodology that would reduce the difference between your actual forecast and the actual load would benefit Disco and other market participants?

A. Yes, I think the most accurate forecast that we can produce would be a benefit to all stakeholders.

Q.272 - Sir, could you describe generally, please, how the residential end use model applies the number of customers,

the appliance saturations and the annual appliance consumption to estimate your future electricity use?

A. Well it is an end use model. So that means that we look at all of the uses that people have for electricity. The top three uses or the -- I guess the three biggest chunks would be water heat, space heat and then base load or everything else.

So the very first thing that we do when we are looking at the residential forecast is we divide up the residential load between these three -- these three areas. And we -- we call it a calibration. And it's essentially we are setting the space heat and the water heat and the base load, set them so that they add up to what we saw in actual fact in the most recent year on a weather adjusted basis.

So we have established space heat and water heat on a per customer basis. So the question then remains is the rest of the load, the base load, and that's when we get into our appliance efficiency model.

Obviously in order to establish your average usage for all of the appliances, the first thing you have to do is determine the number of customers. So that would be step number one.

Then the appliance usage model then takes into account

the penetration of each appliance, which we have from our most recent energy planning survey, which is the survey we spoke a fair bit about this morning. And on a go forward basis, we would then look at the age of each appliance and the consumption of that appliance -- those appliances that exist today or what we call the old stock and the consumption of the appliances that are coming in, the new stock, and basically age the whole stock. So that as the old stock ages and is replaced with new stock, the efficiencies of the new stock are taken into account, because obviously the new stock is more efficient than the old stock. A new refrigerator is going to consume less kilowatt hours than one that is 20 years old.

I am trying to think of your question. Have I touched on the three items that you listed?

Q.273 - Yes, sir. I just -- would it be fair to say that with respect to the appliance calculation, you would calculate the number of customers times the saturation rate to get a sense of what electricity use was for each appliance and then sum that overall appliances to get a total kilowatt hour use? Is that a fair representation?

A. Yes. Yes. That sounds -- that sounds right. I mean the -- all of the model -- the appliance efficiency model is on the record. So if we want to go into some detail I

can pull out the IR and we can go through it page by page. But essentially, yes, that's what we are doing.

Q.274 - Thank you. With respect to the UEC space heating parameters for the end use model, could you just speak generally how that's developed?

A. Well the UEC's would have been set several years ago. I can't say when based on the most current data we had. And we would have sourced as many sources we possibly could. We would have sourced the National Research Council. We would have talked to our energy advisers on what the blend of new and old stock was and established the UEC today. Then in each successive year after that when we did a new forecast, we would have just rolled forward the estimate that was in the previous forecast for the UEC.

Q.275 - Could I draw your attention, Mr. Larlee to PUB LF IR-1?

A. Yes, I have it.

Q.276 - And in that response you state that a number of appliances are sourced from outside of New Brunswick. Could you identify the source of the UEC's and when they were first applied in your residential end use model?

A. I believe the source is Natural Resources Canada. And as I said before, it's a little too -- as I said before,

we did use some New Brunswick specific information from energy advisors, so I was a little too emphatic in this response in saying solely from outside New Brunswick. But I believe the other source we would have used is Natural Resources Canada.

Q.277 - And with respect to that source of information, can you advise when those estimates were developed and what year they were developed for?

A. I am afraid that slips my mind. I will have to get back to you on that end. I know we do know when they were last updated. I will have to take an undertaking to get that to you.

MR. MORRISON: We can give that undertaking, Mr. Chairman.

CHAIRMAN: Thank you.

Q.278 - Sir, if I could bring your attention to LF IR-4 PUB?

A. Yes, I have it.

Q.279 - And in your response you indicate that after completion of the 1990 survey, it was determined that merits of the conditions of the demand analysis were not useful results and that as a result the work did not continue. Could you advise the Board, please, why those result were not useful?

A. I am afraid I can't be terribly specific on that, because I wasn't involved in the particular analysis. But

it's my understanding that just simply get statistically reliable results using the condition of the demand analysis on the data. Largely because of many, many of the appliances don't -- didn't have the penetration necessary to provide good results and we didn't have the variation sufficient to provide good results.

So you end up with getting some data on some appliances and no data on other appliances. And in the end you are not a whole lot farther ahead.

Q.280 - To your knowledge, sir, did that study calculate monthly weather data for each individual respondent?

A. No, it wouldn't of. And the reason why I can sort of say that emphatically is because the amount of weather data we have for the province is quite limited. So Environment Canada over the years is consistently closed. Weather stations that are giving us the data that we need. So we wouldn't either then or now have sufficient weather data to link it directly to a customer.

Q.281 - Sir, are you aware that engineering-based information can be included in econometric CDA models as part of your information to improve the efficiency of the UEC estimate?

A. Well, I mean I am not aware of the specific techniques, but it doesn't surprise me. Essentially when we look at DSM measures, those are engineering-based estimates that

would be done on each of the measures. So I assume there would be techniques that you could apply to this type of analysis as well.

Q.282 - Sir, with respect to the study that was conducted do you -- to your knowledge was there any attempt to specify variables such as monthly heat gain or heat loss based on dwelling unit surface area, solar gain or thermostat settings?

A. I can't speak to it directly whether that analysis would have been done or not. We do -- and we have in the past collected information and energy planning surveys about whether or not people turned down their thermostat. But I can't say for sure whether that type of information would have been analyzed as part of that analysis.

Q.283 - And you may have the same response for my next question, but I will ask if in that study was there any representation for water heating use with specifications that included specific representation for sink/faucet use, number of baths, showers, clothes washing, dishwashing cycles, that kind of information?

A. No, I don't -- there wouldn't be, because our energy planning survey doesn't collect that level of detailed information.

Q.284 - Could you explain to the Board why that is the case --

why that kind of information would not have been acquired?

A. Well as I mentioned earlier, we feel we get a very good response rate on our energy planning survey. So every time someone comes up to my load forecast and says, oh, boy, I would really like you to include this information in your energy planning survey because it would be so interesting, he makes it aware to me that every time we had a question -- that energy planning survey, it's going to increase the chances of someone saying I am not filling it out. It's too long. It's taking too much of my time. This is information that the customer can't imagine why we would -- that DISCO would need or it's personal information that they don't want to share with it.

So we are very careful about (1) expanding the length of the survey too long, and (2) delving into areas that turn the customer off essentially and end up -- we get no response at all.

Q.285 - Sir, are you familiar with the CDA study with five utilities in California where those kinds of questions would have been included in the data survey?

A. Well as a matter of fact as a result of this very process, I am now familiar with that study. And it is quite a study. And with the short form of the report running 400 pages. But the survey itself is 20 pages.

And I understand that, you know, it's five utilities in California where the population is equivalent to all of Canada. But in order to get the response rate they did, they had to go after those customers several times. They sent them the survey. They called them. They went and saw them personally if they didn't respond. And ultimately they had to resample the people that didn't respond by phone to make sure that that group wasn't biasing the entire results.

So obviously because of the length of their survey, they had to work very, very hard to get the response that they needed.

Q.286 - Sir, is there any of those measures that DISCO might adopt in trying to collect that kind of data?

A. Well, I mean it's all a question of the resources that we -- you would want to expend. Right now in years that we do the energy planning survey, I budget $30,000. And that is basically covers the cost of producing the survey, printing it and then mailing it out to customers and bringing it back. It wouldn't cover the cost of -- all our internal costs of admin' staff entering the data and the IT costs of IT support for the database and so forth. So it's not a terribly expensive process, but it is -- it does take a certain amount of money just to do the

survey we have now. And not being familiar other than a very high level with the California study -- believe me I tried, but I eventually had to abandon trying to come with an estimate of how much it would cost to sort of approach that level of detail, just because it appeared to me to be so involved that really without the benefit of someone who had done it before, I don't think I would have come up with a reasonable estimate.

Q.287 - Could I ask has DISCO explored any sort of creative ways of collecting the data, other than sort of a traditional mailouts, and I sense there is a bit of reluctance to expand the form beyond that which it's been traditionally determined, has there been any exploration of trying to look at new alternatives to collect the information that might be useful in the load forecast?

A. Yes. As a matter of fact, the last energy planning survey we did, because -- about the same time we were getting involved with customer satisfaction or we had been running customer satisfaction surveys for a few years. We explored collecting this data over the phone, but it became a cost issue that it's quite expensive to collect data over the phone when you start looking at, you know, more than a few hundred customers. And really for this information to be of value to us, we need thousand of

responses. So we eventually went back to the mailout as the most efficient way of getting the information.

CHAIRMAN: Ms. Desmond, would this be a good time to break for today?

MS. DESMOND: Certainly it's at the discretion of the Chair. I could continue or --

CHAIRMAN: Do you have another line of questioning or are you going to carry on with this one?

MS. DESMOND: No, I would be pleased to stop at this point.

CHAIRMAN: It's 4:00 o'clock. I think we should start at 9:15 tomorrow morning. So it's 9:15. So we reconvene at 9:15 in the morning. Thank you.

(Adjourned)

Certified to be a true transcript of this hearing, as recorded by me, to the best of my ability.

Reporter