YUKON UTILITIES BOARD

YUKON ENERGY CORPORATION 20 YEAR RESOURCE PLAN

APPLICATION TO THE YUKON UTILITIES BOARD

Held at Gold Rush Inn

Whitehorse, Yukon

November 14th, 2006

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BEFORE BOARD MEMBERS:

Wendy Shanks	A/Chairperson
Brian Morris	Member
Richard Hancock	Member
Michael Phillips	Member

BOARD COUNSEL:

Renee Marx

BOARD STAFF:

Pat Wickel &	
Dwayne Ward	Technical Consultants
Deana Lemke	Executive Secretary

APPEARANCES:

Yukon Energy Corporation	John Landry
	David Morrison
	Cam Osler
City of Whitehorse	Wayne Tuck
Utilities Consumers' Group	Michael Buonaguro
Yukon Conservation Society	Sally Wright
Peter Percival	Peter Percival

TRANSCRIBER:

Doug Ayers Reporting Services

(PROCEEDINGS COMMENCED NOVEMBER 14, 2006 9:20 A.M.)

THE CHAIR: Good morning, everyone. We would like to call this hearing to order. Can everybody here me okay? We seem to have a bit of an echo.

Today starts the oral public hearing phase of Yukon Energy Corporation's (YEC's) 20-year Resource Plan; 2006 to 2025. YEC filed, on June the 1st, 2006, with the Yukon Utilities Board (the YUB) its 20-year Resource Plan (the Plan) for the years 2006 to 2025 inclusive.

The Minister of Justice directed the YUB in a letter of June the 5th, 2006 to carry out a review and hold a hearing on the Plan.

Based on that direction from the Minister, the Board had set up a process entailing several steps for this review. The process included preliminary Board information requests to YEC on July the 7th, 2006 with responses received July the 21st, 2006, a Public Workshop with respect to the Plan on July the 25th, 2006 and a Pre-Hearing Conference which took place August the 30th, 2006. Further steps were outlined in Board Order 2006-7, which brings us today to the commencement of the oral hearing.

YEC's 20-Year Resource Plan contains the following: Resource Planning for Yukon Power

Systems; Proposed New Capacity Planning requirements; Proposed Near-Term Actions as well as Proposed Actions Relating to Industrial Development Scenarios and Opportunities.

Within the Plan, YEC has "committed to seek YUB review, prior to construction, of any new capital projects costing $3 million or more." Further, in its December 2004 application to the YUB by YEC regarding 2005 Required Revenues and Related Matters, committed YEC to bring before the Board new or revised capacity planning criteria. The requirement is to be in advance of any capital investment in new generation for capacity reasons.

As was stated in the opening remarks at the Pre-Hearing Conference, YEC seeks review of its 20-Year Resource Plan, including use of its new capacity planning criteria, the planning process; the criteria for longer term development opportunities, and the four near-term projects identified as the Aishihik Third Turbine Project, the Marsh Lake Fall/Winter Storage Project, the Carmacks-Stewart Transmission Project and the Mirrlees Life Extension Project.

As was stated in YEC's November 9th, 2006 update to the YUB and parties regarding these projects, YEC's Resource Plan will no longer

include any plans to pursue the Marsh Lake Fall/Winter Storage Project.

The Minister of Justice specifically requested the Board, in the letter of June 5th, 2006 to: Number 1, review YEC's plan with emphasis on: (a) those projects related to the 20-Year Resource Plan which require commitments by Yukon Energy Corporation before the year 2009 for major investments with anticipated costs of $3 million or more for feasibility assessment and engineering, environmental licensing, or construction; and (b) planning activities related to the 20-Year Resource Plan which Yukon Energy may be required to carry out in order to commence construction on other projects before the year 2016 to meet the needs of potential major industrial customers or other potential developments in the Yukon.

Number 2, the YUB review is to consider: (a) significant utility spending commitments related to the generation and transmission of power in the Yukon that would affect long-term utility costs and rates; (b) the effect of the proposed spending commitments on electricity rates to be charged to Yukon consumers and; (c) with regard to proposed spending commitments and to the extent currently known, their physical and engineering

characteristics and their economic consequences, with emphasis on: item (i), effects relating to The electrical load forecast requirements, including requirements related to potential new major industrial customers or other major potential developments in the Yukon such as the need for spending commitments to meet such load forecast requirements; item (ii), the capability of existing generation and transmission facilities to provide reliable electric power generation to meet the load requirements in (i) taking into consideration capacity planning criteria appropriate and adequate to establish requirements for such electrical power generation capacity in accordance with principles established in Canada by regulatory authorities of the Government of Canada or of a province or of a territory regulating hydro and non-hydro electric utilities; number (iii), evidence that all reasonable alternative options have been considered and that the proposed spending commitments have been selected on reasonable grounds, i.e., technical feasibility, cost-efficiency, and reliability; and item (iv), the analysis by Yukon Energy Corporation of potential risks from all aspects, including but not limited to economic and financial risks, modifications to the scheduling

and design resulting from environmental review and related regulatory approvals.

The Board was further instructed to hear submissions from any persons or groups or classes of persons who have an interest in the matter and to forward a report on its findings to the Commissioner in the Executive Council and make it public not later than October 31st, 2006.

Based on submissions from interested parties, the Board submitted a letter dated July the 26, 2006, to the Minister of Justice to extend the deadline for completion of its review to January the 15th, 2007.

The Minister of Justice agreed to the deadline request in correspondence to the Board dated August the 29th, 2006. In that letter, the Minister also stated the following: It is our government's understanding that no final decision has been made to implement any of the projects proposed. However, the Resource Plan and the input received as a result of your review will be valuable in assisting YEC in planning and decision-making in future. Of course, any specific projects to be implemented by YEC will be subject to various regulatory approvals and reviews. In addition, we would like to note that prior to the implementation

of any proposed significant energy projects by YEC (example, construction of the Carmacks to Stewart transmission line), it is the government's intention to refer the details of such projects to the YUB for review and recommendation under provisions of Part 3 of the Public Utilities Act.

During the Pre-Hearing Conference of August the 30th, 2006, the interested parties were requested to provide feedback on the Minister's letter, the role of the YESA Board (Yukon Environmental and Socio-Economic Assessment Board) and comments on the issues list.

Through Board Order 2006-8, the Board ruled that none of the projects identified in the Plan presently fall under Part 3 of the Public Utilities Act and that environmental considerations are within scope of the review. With respect to the review of the environmental considerations, the Board stated this review will be limited to general comparative information in terms of potential economic impacts to ratepayers. In this Order, the Board also provided the final issues list for the oral public hearing that was set for today.

As we proceed with the oral public hearing phase, I would like to introduce my fellow Board members. They are Michael Phillips, Richard

Hancock and Brian Morris.

I would like to further introduce Board Counsel, Renee Marx; Board staff, Pat Wickel and Dwayne Ward; and the court reporter, Doug Ayers. Parties wishing copies of the transcript for this hearing should contact Mr. Ayers. If anyone has questions with respect to procedure or process, please contact Ms. Deana Lemke or Ms. Marx.

I would like to discuss the schedule we intend to follow for this hearing. We would like to sit from 9:00 to 5:00 each day, with a 15-minute mid-morning break around 10:30, but I now realize we are starting a bit late so the 15-minute break may be pushed on a little bit further. We will have lunch around 12:00 to 1:30 and we will have an afternoon break around 3:30.

On Wednesday evening the Board will provide an opportunity for general public comments on the Resource Plan. This will begin at 6:00 p.m. Depending on how the hearing is progressing on Wednesday, we will aim to adjourn around 4:00 p.m.

I would also like to note that I have been informed that Dr. Billinton will only be available for questions today and Wednesday, and depending on how the hearing progresses today, we may have to juggle some of the cross-examination questions to

ensure that all questions can be asked of him. We will know better if this is necessary at the end of today.

If any party has a cell phone, I would ask that they turn them off at this time for the duration of the proceeding.

To facilitate the efficient marking of exhibits, the Executive Secretary of the Board has circulated a list of the exhibits received to date. The Board has marked that list as Exhibit A-23.

Now, Mr. Landry, I understand that YEC has a one-hour presentation that they would like to give. If you are prepared, would you like to proceed with that?

MR. LANDRY: Thank you, Madam Chair. Madam Chair, what we are intending to do today is that I will introduce the panel members that we have. Yukon Energy is only intending, as you know, to call one panel, which is the panel that is to my right. Mr. Morrison will have a brief opening statement and then we will go into an approximately hour presentation which really is intended to effectively duplicate, in a general way, the presentation that was made by several of these panel members to the workshop at the

beginning of this process, which really, to outline in general, the Resource Plan and many of the issues that you have raised in your opening remarks.

And then at the end of that, I will have a few questions of Dr. Billinton just on the issue of capacity planning criteria. So that is the way we are intending to proceed this morning, and I spoke to Ms. Marx about that.

The panel that is here before you today, Madam Chair and Board members, several of them have appeared before you before, and I will briefly introduce them not only for the record, but for the people in the room. Just for the record, their detailed C.V.s are located at Exhibit B-16.

MS. MARX: Madam Chair ... pardon me, Mr. Landry ... perhaps before Mr. Landry begins, we could have the intervenors register their appearances today and then have Mr. Landry begin.

THE CHAIR: Okay, Ms. Marx, would you like to call for appearances.

MS. MARX: I do not have a microphone here, but perhaps we could start with -- I do not think it matters the order that parties come up, so perhaps we can start with UCG.

MR. RONDEAU: Good morning, everyone, I will introduce myself. I am Roger Rondeau. I am the representative and the in-house consultant for the Utilities Consumers' Group. I have with me Mr. Michael Buonaguro, and he is our legal representative. He is from the Public Interest Advocacy Centre in Ottawa, commonly known as PIAC. And we also have Mr. Pat McMahon as a consultant. We have been in constant contact with him, and we still remain so through the hearing. Thank you.

MS. MARX: Yukon Conservation Society?

MR. PINARD: Hello, my name is Jean Paul Pinard otherwise J.P. I am with the Yukon Conservation Society. I will have an assistant, Nick De Graff who represents YCS, and also Lewis Rifkin, who is not present today but may be present on Thursday should this proceeding continue.

MS. MARX: I don't believe there is anyone here from The City of Whitehorse. I had spoken to Mr. Tuck this morning, and he indicated that he would not be able to attend today but anticipates being here tomorrow.

Are there any other registered intervenors? I do not see any further intervenors, Madam Chair.

THE CHAIR: Thank you, Ms. Marx.

Mr. Landry, would you like to proceed.

MR. LANDRY: Yes. I suppose for the record, I should introduce myself. My name is John Landry and I am counsel for Yukon Energy Corporation.

Yes, I would like to introduce the panel members, Madam Chair, and I will start to the far right with David Morrison. Mr. Morrison, who is a long-term Yukon resident, is the President and CEO of Yukon Energy Corporation and the Chief Executive Officer of Yukon Development Corporation. He graduated from the University of Carleton in 1986 and since that time has completed a number of post-graduate certification programs including at the Banff School of Management and Negotiation for Senior Executives and the Harvard Business School. Mr. Morrison was the chairman of Yukon Energy Corporation, Yukon Development Corporation and the Energy Solution Centre in 2003 to 2004, before joining Yukon Energy Corporation in his present capacity in 2004.

To Mr. Morrison's left is Mr. Cam Osler, who the Board and many of the intervenors are familiar with. He is a founding partner and President of InterGroup Consultants Limited; graduated from the University of Manitoba in 1964 and completed his

Masters in Economics in 1968 from Simon Fraser University. Mr. Osler has provided utility regulation expert analysis and testimony at numerous hearings not only in the Yukon but in Manitoba, British Columbia and Ontario. Mr. Osler, as this Board is aware, provided expert testimony for Yukon Energy before this Board since '89 including the hearing that was held relating to major capital projects 1992 and electricity costing and rates related to all rate applications since that time.

Next to Mr. Osler is Hector Campbell, who is the Director of Resource Planning and Regulatory Affairs for Yukon Energy. He has been directly involved in the operation and management of Yukon Energy since 1990. He is a graduate of the University of Calgary in mechanical engineering and obtained his professional engineering certification back in the mid '70s in Alberta and then in 1990 in the Yukon.

Next to Mr. Campbell is Patrick Bowman who is also a principal and consultant at InterGroup. He graduated from college in 1994 and then completed his Masters in Natural Resource Management from the University of Manitoba in 1998. Since joining InterGroup, Mr. Bowman has worked as a research

analyst, consultant and principal. He specializes in the area of regulatory economic analysis and socio-economic impact assessment primarily in the energy field. He has done extensive work in utility regulation and has appeared as an expert witness in a number of Canadian jurisdictions for both electrical and gas utilities.

Next to Mr. Bowman is Dr. Roy Billinton, and Yukon Energy is pleased to have Dr. Billinton with us here today. Dr. Billinton is presently Emeritus Professor of Electrical Engineering in the College of Engineering at the University of Saskatchewan. Dr. Billinton graduated from the University of Manitoba in 1960 and he obtained his Master's degree from the University of Manitoba in '63 while working for Manitoba Hydro in the System Planning and Operation Divisions. In '64, Dr. Billinton joined the University of Saskatchewan as assistant professor in the Department of Electrical Engineering and obtained his Ph.D. degree in '67. He was also awarded the Doctor of Science degree by the University of Saskatchewan in '76 for his work in the area of Reliability Evaluation of Electric Power Systems. He also served as Chairman of the Power System Planning and Operating Section and Chairman of the Engineering and Operating Division

of the CEA.

Dr. Billinton has co-authored eight books on reliability evaluation and over 850 technical papers, many of them in the area most relevant to the issues that he will deal with here today. He is a fellow of the Institute of Electronic Engineers, the Canadian Academy of Engineering, the Engineering Institute of Canada and the Royal Society of Canada.

So that, Madam Chair, is the panel that will be testifying here today. Mr. Morrison has a preliminary opening statement that he would like to give, a brief one, and then we will go immediately into the presentation. And Madam Chair, what we are intending to use is a Power Point presentation, but the Power Point presentation really is going to review the Power Points that were put into evidence after the workshop, and it's actually Exhibit B-7 that people can refer to as the Power Point presentation is gone through. So with that, Madam Chair, we will put it over to Mr. Morrison.

THE CHAIR: Thank you. Please proceed, Mr. Morrison.

OPENING REMARKS BY YEC:

MR. MORRISON: Thank you, Madam Chair. Good morning. My opening remarks will, as

Mr. Landry said, be very brief, but I think just to put matters in context, I would like to make a few points this morning.

As was previously mentioned in the introduction to the hearings, YEC made a commitment, both in our Revenue Requirement Hearing in 2005 and in a number of occasions subsequent to that, to find a way to ensure that all of our projects over the $3 million capital level were reviewed by the Yukon Utilities Board. And I am very pleased that we are here today to do that. This is, from Yukon Energy's point of view, a very significant step. It is a long overdue step and I think a significant move on our part to make sure that these projects are thoroughly reviewed both by the Board and receive the kind of public scrutiny that they deserve prior to the Corporation going ahead with construction of large new capital projects.

In response to that commitment, as mentioned previously, we submitted our 20-Year plan. I am very pleased to have that plan in front of the Board today. This plan took a considerable amount of effort by the Corporation and both staff and advisors over the period of the last year, and in our view, presents a very good overview of not only

projects but the other details and issues that need to be dealt with when you talk about planning, and so projects are one thing, and they are one area of the Plan itself, but we have also been able to build into this the need to look at planning on a long-term basis and to deal with such issues as capacity planning and long term study. So I am very pleased to have the Plan in front of the Board.

The Plan is also consistent, I think, with our role as the primary generator and transmitter of power within the territory. And yes, we do have a private utility that distributes power in a number of communities and also generates in other communities, but it has been traditionally Yukon Energy's role to be the primary generator of power and also it is clear that Yukon Energy is the main transmitter of power within the integrated grids.

More importantly from my perspective, it is management's responsibility within the planning context to make sure that the assets that the Corporation manages on behalf of ratepayers are utilized to the best extent possible. And it is in my very strong opinion that you cannot manage assets to the best extent possible without doing -- or going through a planning exercise, and a

rigorous planning exercise to ensure that you are looking at all of the different avenues that have to be looked at in order to make sure these assets are providing a return generating the power that they could and should and that we are spending the ratepayers' money in an efficient manner.

We have had surplus hydro for some time on this system. I think this is the first time in a number of years that we have been able to bring forward a plan that would address how we might deal with the surplus hydro in the near-term.

It is also, I think, important that not only have we brought forward a Plan today, but it is our commitment, our further commitment, that this Plan will be brought forward on a regular basis. Our approach at the moment would suggest that we would look at this Plan on an annual basis, and if necessary, bring forward any major new projects or new initiatives that we had identified that were not in the Plan. We would commit to the Board that, on a five-year basis or perhaps even a three to five-year basis, depending on the necessity, that we would bring back this Plan on an update for public review. I think it is one thing to do the plan, but there is not much point in having a Plan if you are not going to use it and you are not

going to continually address the issues within the Plan to make sure that, as you go forward, that the Plan is still relevant.

As the chair mentioned previously, the Minister's letter has set out in detail the scope for this review and I think Yukon Energy has been consistent in its efforts to make sure that we get a full public review of our Plan and particularly the capital projects that are outlined in the Plan. We have, as everyone knows, not only submitted the Plan, but we have provided detailed and comprehensive material to answer the questions from intervenors and from the Board. This information is comprehensive in every fashion and provides, I think, a full -- an opportunity for a full assessment of the projects and -- projects in the Plan and as well as the items such as capacity planning.

We need to move forward as an organization at this time, and the Plan is, I think, the first step in that moving forward. We need to move forward for a couple of different reasons. One of those is that we have opportunity here to sell some surplus hydro; and the other is that we also have identified a need to make sure that we have adequate generation on the system in terms of

system capacity. And the time to look at both of these issues is now.

As part of preparing our capital plan, or the Resource Plan, we undertook a number of steps, and one of those was to examine our capacity planning criteria and whether or not the Plan -- the criteria itself was adequate at the time. In order to do that, we provided some internal resources towards looking at the examination, but as Mr. Landry mentioned earlier, we also engaged Dr. Billinton and Dr. Billinton, as you will know from his C.V., is one of the leading experts in the world on issues of reliability and capacity planning. We are very pleased that Dr. Billinton was able to assist us with this work, and we are very pleased as well that he is able to join us here today and answer questions.

It is capacity planning, and I think as well, there are issues around the operation of utilities that sometimes challenges all in terms of understanding how they work, but I think it is very important at this point to understand that capacity shortfalls come at a time when we have energy surpluses and these are difficult concepts.

We can all look back to last winter when we had a major power outage and understand that it

wasn't a question of having energy surplus, it was a question of whether or not we had the right amount of capacity in the system to meet the need at that time. So when we look at the capacity shortfall issue, and we believe there is one at the present time, we have addressed that by bringing forward a number of projects in the near-term focus. We have also brought forward a number of projects in the near term that focus on our opportunity to sell this surplus hydro that I mentioned earlier. So the near-term projects take two different tracks but both I think prove the need to build and to have these projects go forward.

As mentioned, we have withdrawn our project or proposed project to establish some winter storage -- additional winter storage at Marsh Lake. We still intend to go forward with the Mirrlees Life Extension, the Aishihik Third Turbine, and particularly the Carmacks-Stewart Transmission Line Extension.

The last part of the Plan, and not by any means the least, but the last half of the Plan, looks at the need to address long term resource planning. In that regard, we are trying, and I think have fairly outlined the need to look at

potential future opportunities, what are the requirements going to be on the system coming past the near-term and into the longer term periods, and how do we plan to deal with those questions, because sitting and waiting for things to happen is not going to get us a capacity on the system to meet future requirements.

We have set out, I think, within the Plan, resources that we are likely to pursue for a range of scenarios based on industrial load, size and duration and, in many cases, life of an industrial load, as we all know, is more important than its size.

With those opening remarks, Madam Chair, I will turn the presentation over to my colleagues on the panel, and we are here to answer your questions as the proceedings go forward and thank you for the opportunity this morning. Thank you.

THE CHAIR: Thank you, Mr. Morrison.

MR. MORRISON: Mr. Osler.

MR. OSLER: Madam Chair, I am focusing on the slide show that we used, Exhibit B-7, in the workshop that was held on July 25th. There are copies available from Mr. Landry and company for anybody that needs an extra copy

today.

The intent of what I am going to do is try and get this presentation, it took a lot longer in the workshop, done much faster, to highlight the places where there have been updates or changes so that people can see the things that have happened since that time, and to provide generally, with my colleagues, an overview of the Resource Plan and the key project that we gave in the workshop.

The outline of the presentation was broken into two parts; first was background, which dealt with Chapters 1, 2 and 3 of the report, a basic review, planning framework, the background on Yukon Energy systems and the new capacity planning criteria; and then Part 2 focused on Chapters 4 and 5 or Parts A and B of the Minister's letter, the near-term projects that are 3 million or more, and why they are put forward in near-term requirements; and the longer-term industrial planning requirements that go to the planning beyond the near-term, but for projects that might be in place before 2016.

Going to the next slide, Mr. Morrison, in the workshop, reviewed our filings. I would just say a couple of things on this, without going through the slide in detail. Really at the time we had the

workshop, we had three major filings at that time: Exhibit B-1, which is the January 2006, Resource Plan; Exhibit B-3, which was the supplement to that plan, dated May 2006, and provided to the Board at the same time when the report was filed in June of 2006, and Exhibit B-2 which is the June 1 overview which effectively attempted to incorporate the changes and the supplement to what was in the January plan. In theory, the overview was supposed to be up to date.

I want to say, when we go through these, the January document was written, as Mr. Morrison says, with some considerable effort, in the year 2005. It has information and numbers which in some cases have changed significantly, for example the Minto mine. They changed at the time we did the supplement and they changed again at the time we did the update filed November the 9th. So we should keep that in mind when we are reviewing the documents.

As I just highlighted, we have had, if you like, two major filings since the workshop. Exhibit B-13 is the filing we gave to the Board which is the same filing we made with YESAB in October, the full environmental and socio-economic review filing for the Carmacks-Stewart project, and

Exhibit B, I think it is 16, which is the update document filed last week, which updated various projects and gave most recent information that we had available on the key near-term projects.

In terms of the next slide in the presentation, it was a review of the Minister's letter which Mr. Morrison and the Chair have already covered today. At the bottom of that slide, it referred to the earlier date that the Chair has already announced is changed to January 15th, given the Minister's letter received shortly before that Pre-Hearing Conference.

The next slide, slide 5, went over the public consultation process, which I won't go through today, the information is on the record, that Yukon Energy, after it released the report in June, carried out a consultation process in Yukon, in June and July, and we filed the information with the Board and the documents are available in various places throughout Yukon.

So basic review process was the first thing we dealt with in the workshop. Going on to the sixth slide and getting into more material for today, the Resource Planing framework which is addressed in Chapter 1 of Exhibit B-1. As Mr. Morrison has just said, we have capacity planning and we have

energy planning and it helps to make clear the difference between them.

Capacity focuses on meeting the highest or peak requirement required on each one of our individual systems, the WAF system, the Mayo-Dawson system or any isolated system. Yukon Energy is responsible, of course, for the WAF and the Mayo-Dawson systems. When we talk about a capacity capability, we include the reserve capability needed to meet unplanned outages. What happened last January was a capacity problem, the Whitehorse-Aishihik-Faro -- the line between Aishihik and Whitehorse, the capability of getting energy between Aishihik and Whitehorse was lost for a period of time. It happened to be the coldest time of the year, or near the coldest time of the year and it had an effect in terms of the system, there was an outage.

Despite the fact we have energy in surplus, hydro energy in surplus, we did not have the capability to deliver power when we needed it. That's what capacity planning is all about and it includes dealing with contingencies or unplanned outages which you should be able to anticipate a need to provide for and should not be terribly surprised when they occur, based on probabilities

and experience.

Energy planning and contrast is looking at your ability to supply energy, kilowatt hours over a period of time, over the year, over a season, over a month. In the case of Yukon, we do not have any dire threat to be unable to supply energy because we have lots of diesel capability in reserve to supply energy. In my home jurisdiction in Manitoba, energy, with their hydro systems, can be the planning constraint.

In Yukon, the main issue with energy is if we can displace diesel we can save money, therefore planning with respect to energy usually involves debates about options that would displace diesel in order to reduce the reliance on that particular source of energy, and what are the economics and what are the risks and everything else to do that. This entire document, as the document in 1992, requires a fundamental understanding of the appreciation of capacity versus energy in planning.

Slide 7, effectively the capability -- when we look at a Resource Plan, we go through certain steps. We look at the system capability, system by system, WAF as distinct from Mayo-Dawson, the forecast condition of those assets and their

capability to deal with unplanned outages; capacity adequacy.

Secondly, we look at system requirements, what's the forecast for peak and energy use over the next 20 to 40 years? Then we look at three new facility requirements, we compare, obviously, the forecast capability with the requirement forecast and see where we have a shortfall or a need in either capacity or energy, and we keep the two quite separate.

Fourthly, we look at resource options; what do we have available to us to meet those capacity or energy shortfalls, and if there is not a shortfall in energy, what options do we have to displace diesel and is it economic for Yukoners to do that?

And finally we look at assessment of options, both technical feasibility, including timing, obviously the overlap of timing, load areas, cost efficiency, reliability, risk, and other relevant considerations.

The near-term projects we are talking about in this document are different stages of pre-decision planning. Page 4 of the overview has a graph that describes the difference between the Plan and the projects. The Plan comes up with preferred project options. The decision-making on any one project

goes through a whole set of stages before the Board of Directors of Yukon Energy makes a final decision to commit to build it. Each one of the projects we have in the near-term are at different stages in that pre-decision project and we will presumably answer questions on that.

But an individual project does not get a final commitment from Yukon Energy until the Board of Directors has gone through the steps in that particular diagram, and none of these projects have reached that stage; in that sense, none of those projects have any final decisions on them from Yukon Energy.

Slide 8, today is quite different than 1992, when Yukon Energy, along with the other utility, appeared here to present a plan for the next ten years at that time. In 1992, the focus was very much on when would the Faro mine close. We know the answer to that today, but we did not know it then. And we grappled with the contingencies of what we might do in different situations. In other words, we were very worried about a loss of load, but how to plan in that context. And we, in the end, had no proposed projects because there did not seem to be a good basis for proposing anything to do at that time.

The loss of the 25 megawatt load and the 180 million kilowatt hours, gigawatt hours, from Faro, has made a profound difference. It has created a surplus year-round on the Whitehorse-Ashihik-Faro system of some 85 to 90 million kilowatt hours, today, of hydro.

It changes everything in terms of our planning and focus, and we will deal with that. The Mayo-Dawson transmission line has changed the situation dramatically since the time we appeared in 1992. Dawson is no longer served by relying on diesel, it is served by the surplus hydro from Mayo. We have renewed various water licences that were in issue at that time so that all the water licences of Yukon Energy are renewed.

The material surplus of hydro on the two systems, WAF and Mayo-Dawson, remains today and, without major new industrial loads, this Plan shows that it would continue to remain for most of the next 20-year planning period. It would probably continue until around the year 2020 on the WAF system.

So if we don't have new industrial load, we will not need to worry about energy on the WAF system, but we will still have problems with capacity.

Slide 9, there are certain key factors driving the near-term in terms of our future requirements; not just the near-term but over the next period of time that we are covering in the Plan.

There is an immediate need for new WAF generating capacity, capability. This need reflects a combination of factors: load growth; retirements of units such as the Mirrlees at the Whitehorse diesel plant; and the new capacity criteria. The biggest single factor in all of those is probably the new capacity planning criteria, but retiring 14 megawatts of Mirrlees over the next few years, without changing, is also a very big factor. Load growth is by far the least of the three factors.

There are also potential new mines planned for the period to 2009. The Minto mine has now gone beyond planning. As the update documents, the Minto mine is now a mine that is over one-third built, it has got its financing and it is going to start producing in the second quarter of next year.

In the context of the other mine noted here, Carmacks Copper, it is still in its licensing phase and hasn't substantively changed status since the time we wrote the documents.

These create opportunities that are time sensitive, and I would say the Minto mine, if it generates -- it will open generating power that it needs with diesel. The Minto mine will create more diesel generation than the entire utility system in Yukon currently generates, the YECL and YEC systems which was less than 25 million kilowatt hours a year versus the Minto mine at about 32, 32 1/2 million kilowatt hours a year. So if you are interested in diesel emissions or things like that, the opportunity to serve this mine in the time that it is there is material.

A range of other longer-term industrial development scenarios between 2009 and 2016 ... here we are dealing with contingencies, uncertainties, but we are trying to understand what they might look like if they materialize and how we might react to them, and that is Chapter 5 in the document. But it is a totally different situation than 1992, it is a situation where, rather than worrying about when we are going to lose this load, we are discussing how we might deal with opportunities that would push us into the need to meet new loads and how we would deal with that.

Our overall conclusion in the document is that we need to balance a range of different factors

when trying to deal with these long-term issues, and we are here to answer questions about how to do that balance and what is involved.

Finally, in terms of background, Slide 10, when we looked at the longer-term in particular, 2009, 2016, we developed a way of thinking about it that was sort of represented in this graphic. To think of the different options that might materialize, we thought of a continuum from the very smaller loads to the much larger industrial loads that might materialize. And the graphic says, okay, if you have very small loads, and I think the document will say up to, say, 10 megawatts, we really have a capacity-related issue because of the reason I just gave, but not a need to look at displacing diesel. But once you get more than just the Minto and the Carmacks Copper mines and you start getting mines getting back up into the scale of what Faro was, 20, 25 megawatts, there is more than just capacity to deal with. You should be looking at cost-efficient ways to displace diesel use through new hydro generation.

So both capacity and energy start to become a play with the larger mines that might be a possibility in this time period. And we took it all the way through, because the time period could

include the completion of the pipeline through Yukon within the next 10 to 15 years. What if Yukon Energy or Yukoners in general were to try and supply some electricity to the major compressor stations for that line, which is a level of load way outside of anybody's experience here; and, secondly, what is that pipeline going to do in terms of making available natural gas that the utilities here might use to generate electricity under different costing frameworks than we have today? So that is what the graph is telling you and that is how Chapter 5 is organized.

I would just make one more point. The graph talks about megawatts. In reality, the analysis shows it isn't just the megawatts of a new mine's load, is the mine 20, 25 megawatts of extra load, is it close enough to the system connecting it, all those factors, but how long is the life of that mine? If the mine is only ten years, we are not going to build an asset, very often, that has a long life to it just to meet that short life. On the other hand, if the mine has a life of 20, 25 years, it really does open opportunities for new hydro generation if they are cost-efficient options.

Now, Hector Campbell will briefly review what

was effectively the background section of the main report on the Yukon Energy systems.

MR. CAMPBELL: Thank you, Cam.

Yukon Energy, at present we have a capacity of 112.4 megawatts, Yukon Electrical have an additional 15 megawatts, that yield a total capacity in the Yukon of 127 megawatts. We note that Yukon Energy owns and operates the two major transmission grids in the Yukon, the Whitehorse-Aishihik-Faro grid which operates at a voltage of 138,000 volts, and the Mayo-Dawson is a 69,000 volt grid.

Most of the Yukon's hydro and transmission facilities were built in response to the major mines that have operated in the past in the Yukon, and I think it is important that there is some recognition that in fact, without these mines operating and helping to pay for a lot of the major assets in the Yukon, the assets would not exist today.

That is certainly true of the Aishihik plant, the Whitehorse Rapids Unit 4, the Mayo hydro plant. These facilities were built solely to serve operating mines in the Yukon at the time. They are now extremely valuable assets to Yukoners today because, by and large, they are largely paid for,

so they are assets that are quite highly depreciated and it affords Yukoners quite reasonable power rates today.

If we look at a comparison of Yukon power rates, and again in Exhibit B-2 in the overview, on page 8, there is an example of some comparable rates throughout the north, if we also look at the Interrogatory UCG-YEC-234, we have provided a number of additional comparative rates not only throughout the north but throughout southern Canada and some parts of the United States, really that shows the rates that a lot of Yukoners are able to enjoy today because of these legacy assets being available.

As Mr. Osler has briefly described, there are two main power systems in the Yukon, and that is basically what this graph shows; the Aishihik, Whitehorse and Faro grids in the south part of the Yukon, the Mayo-Dawson grid in the north part. Of interest, of course, one of the near-term projects that Yukon Energy is proposing to do is from Carmacks to Stewart, which would connect the two main hydro transmission grids in the Yukon and it would also provide a means to service the two most likely near-term mines. Again, I would note the Minto mine, you may also

hear called Minto Exploration, you may hear it called Sherwood Copper. The current owners of the mine is Sherwood Copper but it will be referred by any one of those three, perhaps by ourselves or by some of the intervenors. As well as the Carmacks Copper mine you will hear called Western Silver, Western Copper, again the current owners of the mine are Western Copper, but they are in fact referring to one and the same mine.

If we look at the overall mix of generation capacity in the Yukon, we certainly find, from Yukon Energy's perspective, obviously the balance of our generation, the major part of it is hydro. We have 75.4 megawatts of hydro, we have .8 megawatts of wind, and the balance of 36.4 megawatts is diesel generation.

We have heard the last two speakers talk about capacity and energy, and I think it is extremely important to note that, in fact, of course in the Yukon, being a northern climate, our peaks occur in the wintertime. We don't have a huge air conditioning load in the Yukon, at least not yet. So it is important for us to recognize that in the wintertime, particularly at the Whitehorse Rapids facility, we don't have enough water to generate at the full capacity of the system. In fact, the

system, on average during the four coldest winter months, is derated from 40 megawatts to 24 megawatts.

We note as well that, by and large, excluding the industrial load component, the driving factor in capacity is the planned retirement of 11.4 megawatts of 35-year-old diesels in the Whitehorse diesel plant. We are also seeing what we would term as modest growth of our non-industrial loads, averaging around a megawatt per year of growth and around 4 gigawatt hours a year of energy growth. So when we talk about being short capacity, our peaks are growing at around a megawatt per year, and our annual energy sales are growing around 4 gigawatt hours a year.

The reason that energy is not a significant issue for us today is we have upwards of 90 gigawatt hours a year of surplus hydro. So, when you are growing at 4 gigawatt hours a year, you have a pretty good cushion there in the short term. Now, that would be eaten up, of course, significantly with the one or if both of the two mines that we have mentioned do come on stream.

Today, over 90 percent of all of the generation in the Yukon comes from hydro, of which, if we look at just generation by Yukon Energy, it

is about 99 percent. As I have just mentioned, on the Whitehorse-Aishihik-Faro grid, we have upwards of 90 gigawatt hours a year, on average, of surplus hydro energy, and around 17 gigawatt hours per year surplus hydro on the Mayo-Dawson grid. We are able to supply surplus hydro at a very low cost for new firm power sales, such as the Minto mine, in terms of the supply of energy. Obviously, there is still a cost to connect those mines to the existing grids. We do note that any new firm sales on either the WAF or the Mayo-Dawson grid will help keep rates down for all Yukoners.

If the sales on the WAF grid grow more than 90 gigawatt hours then, as Cam has mentioned, we will be short hydro energy, and that is the point in time where we would be planning, of course, in advance of that, for ways to bring on new cost-effective sources of energy, preferably renewable energy.

Just a little background in terms of some of the work that the Corporation did sort of prior to preparing the application for the Resource Plan. A major point that Yukon Energy embarked on in the late 2003, completed in 2004, was the completion of some major assessments of the condition of the major assets of the major transmission, substation

and generation assets. These have been filed certainly last year in the course of the 2005 General Rate Application.

Basically, the reports note that, overall, the assets are in pretty good conditions, and will be there to service Yukoners for the duration of the Resource Plan. The primary exceptions to that would of course be these three aging Mirrlees units at the Whitehorse diesel plant. B.C. Hydro indicated that, without major reinvestment in these units, they were at their end of life. They have been planned for retirement several times between the 1992 Resource Plan and today, and the Corporation has looked each time at retiring them, and been able to life-extend them for a few more years.

The current retirement plan for these units is one unit every second year starting 2007 so the dates would be 2007, 2009 and 2011. Further delays of these retirements is simply not possible without major refurbishments of these units. That's all I have.

MR. BOWMAN: Good morning, Madam Chair, members of the panel. The next number of slides deal with Yukon Energy's capacity planning criteria that it has adopted and the background

leading up to that criteria. This is a section of approximately five slides that I dealt with at the workshop and I will go through them here again in a similar way. Dr. Billinton will be available to answer questions on many of these topics as we move through the hearing.

The topic of capacity planning is dealt with in Section 3.3 in Exhibit B-1, and also in the overview, Exhibit B-2, and there are quite a few interrogatories on this topic. It is bit of a difficult topic to deal with because, at one level, it is very practical and easy to understand that the system must have back-up and it is easy to envision the need for the back-up to deal with contingencies but, on the other hand, it can also be a very technical and complicated topic, and so I will try to balance the two so that we can make the most of the time we have.

In general, though, capacity planning criteria relates to the reliability of the power system, but it is only one of the factors that goes into the reliability of the power system. It relates to the adequacy of the generation on the system, and a means to determine when the amount of generation and related transmission is adequate or is inadequate. The slide notes that there are other

aspects of providing reliable power at the bulk power level and also at the distribution level that are not related to the sufficiency of the generation, the adequacy of the installed generation. We are just trying to focus on the adequacy of the installed generation in regards to this criteria, and the criteria will have to make sure that there is sufficient capacity installed to be able to meet peak firm loads, not including secondary sales. We do not plan for peak loads to meet secondary sales. They would be interrupted at any time where this criteria -- where the capacity is constrained in the way assumed in the determination of these criteria.

Any utility has to have a means to determine when it has sufficient capacity installed and to know how much to install. Yukon Energy, as a generation utility, has always had such a criteria. It started off using the criteria that existed for NCPC. It was a simple criteria that added up the number of megawatts, added in an assumption that a given number of units will be down at any given time, and a percentage reserve factor, and compared that to the peak loads. It is very similar to the criteria that is used on non-interconnected simple systems elsewhere in

Canada, such as diesel communities in Manitoba or Newfoundland or Northwest Territories. And the math that was used in that, determining that, the number of megawatts that could be carried by the system under that criteria, is set out at Page 3-17 of Exhibit B-1, the main Resource Plan.

By 1992, Yukon Energy, as part of the Resource Plan filing, did a review of its criteria and made some small changes. At that time, it brought forward to the Board a criteria that incorporated, for the first time, an assumption that not only must you be protected such that you can supply the load with the largest unit out, you also would want to look to the probability of diesel units being out. The system was having a large number of diesel units installed and, at any given time, there was a probability that some number of those would be out of service, and so it had, as a simple concept, a 10 percent additional reserve factor, 10 percent of installed diesel, to deal with the start of using a probability concept rather than a simple, what we call, deterministic or adding up of megawatts on the supply side versus the demand side.

That criteria, out of the 1992 review, was used by Yukon Energy in the '93/'94 GRA and in the

'96/'97 GRA, which was the last time that the system's capability was reviewed before this Board. And at that time, in the 1996/1997 GRA, with the Faro mine operating, it was right at the limits of what the system could provide but the criteria was not indicating any need to add new capacity.

Following the closure of the Faro mine, as everyone can appreciate, the loads dropped substantially and there was not a major concern of capacity for some time. There were some changes in the system, some of the diesel units needed to be retired, one in particular at Faro, some diesel units were relocated from Faro to make better use of them in Mayo or in Dawson, and we had an ongoing load growth after the initial impact of the Faro mine -- ongoing load growth in Whitehorse. When you combine that with the plan for the three large Mirrlees units that Mr. Campbell referred to in Whitehorse, the plan to retire those units, the system was getting back to the point where one wanted to start paying attention to the capacity installed and the adequacy of the generation.

In the 2005 application, Yukon Energy noted that it was starting to pay attention to this issue again, and that although the criteria that had been

in place, the long-standing criteria in place since 1992, was not indicating a concern with the amount of capacity, other factors were suggesting that that criteria may no longer be adequate for the system as it exists today, compared to the period when the Faro mine was here.

We discussed this in the 2005 proceeding, and at that time, the main concern was focused on Whitehorse, the issue being that the existing criteria suggested Whitehorse could be fully supplied -- or that the WAF system had sufficient generation despite the fact that, after you retired the three Mirrlees units, Whitehorse would only have about 36 megawatts of winter capacity installed even though the peak was getting into the high 40s, 46.7 at that time. And we also recognized, in that 2005 application, that the old criteria did not consider, in any way, the risks related to the issue of transmission line.

Finally, in that same period, Yukon Energy was made aware that the Northwest Territories had done a major review of its capacity planning criteria for the Snare-Yellowknife system, a very similar system to the WAF system, and had had new capacity criteria approved by the Northwest Territories' PUB. So given all that, it was timely to get on

and review the criteria and its suitability for the system as it exists today, and that was put to the Board in 2005.

As a result of the decision to review the capacity planning criteria, Yukon Energy made a decision to retain Dr. Billinton. Mr. Morrison has already set out a bit of detail on that decision. Dr. Billinton was retained, and his associate, Dr. Karki, to consider the WAF system in particular, and the current capacity planning criteria in comparison to modern standards for generation adequacy and, in particular, to bring their skills in looking at probabilities of outages and probabilities of units being out of service, rather than the simple deterministic approach as we call it.

The studies prepared by Dr. Billinton and Karki are filed in the first round interrogatories YUB-1, and a comparison of some detail in the Northwest Territories criteria is filed in YUB-2, as relevant interrogatories on this topic. But overall, the analysis indicated that the old criteria, previous criteria, was providing a level of protection in '96/'97 that suited the system at that time, but is no longer suitable for the system as it exists today; and in particular, if the old

criteria had been kept, Yukon could expect to see outages about three to six times higher than would be targeted by utilities elsewhere in Canada, due to the inadequacies of the generation and transmission system. And the study specifically focused on the risks related to the issue of transmission line, because there is 30 megawatts of generation at the other end of that line that is effectively needed to keep the power on and the lights on, on the remainder of the system, during very cold weather.

As a result, Yukon Energy worked with Dr. Billinton to review some options, to look at the criteria that was adopted in Northwest Territories. The detail on the Northwest Territories criteria, and the Board's decision in their review, is filed in YUB second round questions Number 7, but in the end YEC reviewed and considered a criteria very similar to what was adopted in Northwest Territories.

To go straight to the criteria that Yukon Energy has adopted, it is, as I noted, basically the same criteria as the Northwest Territories and it involves two parts. The first part of the criteria uses a measure that is called LOLE, or loss of load expectation. And what this measure

does is it considers a long-term average that the system can expect, of being unable to supply the peak load, and how many hours per year they could expect as a long-term average, due to the inadequacy of the generation and transmission system. Other Canadian utilities typically are focusing in the range of one to two hours per year; Yukon Energy has adopted a target of two hours per year. That criteria looks at the overall balance of the system, it considers all of the loads on the system, a fairly complicated mathematical modelling dealing with the probability of each of the units on the system, and the issue of transmission line of failing at any given time, and it looks at these long-term averages that can be expected.

As a complement to that criteria, both in Northwest Territories and in the Yukon, there was a concern that long-term averages may mask the extent to which one might be exposed to a significant outage of a long duration; not very often, but when it happens it would be a major event. There are some ways to deal with this, and one of them was adopted by Yukon Energy, which was to adopt an N-1 criteria. It is also titled the Emergency Criteria. And the basis of this is that there should be enough generation installed on the system

in order to deal with the largest single contingency event and still meet peak loads. In this case, peak loads are focused on those loads that would not traditionally have their own back-up, so residential and commercial loads, not necessarily industrial loads, and it deals with, as the N-1 event, the worst single contingency. It deals with exposure to Aishihik transmission line outages of the type experienced on January 29th.

N-1, as a concept, is a typical standard used in many places in North America. It is typically used as a transmission line planning criteria and, in this case, we are applying it to a transmission line in regards to the Aishihik line being the largest single contingency, and it reflects the fairly unique characteristics of the Yukon system compared to most systems in Canada. Yukon and Northwest Territories in particular have a substantial amount of their core generation located some distance away, along a transmission line that has no redundant path. There is no alternative to get Aishihik power to Whitehorse, other than the Aishihik line.

And finally, as what is cited as a criterion but it is actually more of a guidance, in the cases where new diesel is being added in order to enhance

the ability of communities to have their own back-up, Yukon Energy would look towards those communities that are large enough to justify about a one megawatt diesel unit as a preferred location for putting new diesels, to the extent new diesels are being added to the system. It is not a criteria to go out and install these, it is just a guidance to where is the best place to locate new units, to the extent one is adding units of that size. And currently every community of that size on the system, on the WAF system and on the Mayo-Dawson system, meets the criteria with the exception of the Carcross area. And we make some reference to that in the near-term section of the Resource Plan.

That is the end of what we had dealt with as the first part of the presentation in the workshop. Moving onto the second part which deals with Chapters 4 and 5 of Exhibit B-1, Chapter 4 being the near-term requirements of the system, and Chapter 5 being the industrial development scenarios. This next section of the presentation will address those sections and in doing so, it makes a review of each of the projects that Yukon Energy is planning to pursue, and notes the comment made earlier by Mr. Osler that no final decisions

have been made in terms of the decisions made to proceed with the project.

In terms of the near-term, the Plan, in Chapter 4, reviews in some detail the load forecast for the system, focused on the next number of years, consistent with bullet (a) in the Minister's letter, so load forecasts that are driving requirements to invest in projects in the next number of years, and it deals with a base case as well as a number of sensitivity cases.

The chart on this page sets out the capacity shortfalls that arise in each of those scenarios, and as we noted there, capacity is the key driving factor of investments on the system in order to ensure adequate supply. The shortfalls in capacity, under the base case loads, by 2012, are 18.7 megawatts. Over 75 percent of this shortfall is due entirely to the retirement of the Mirrlees units and the adoption of the new criteria. In other words, it is not dependent at all on any given assumption about where the load growth on the system is going. These are factors that are known today, we know the peak loads today, we know the retirement of the Mirrlees is needed, and that drives the criteria to invest. The specific number of megawatts depends somewhat on the load forecast

but only to a small degree, only on the margins.

The need to invest in capacity is only slightly higher. If we look down, compared to the 18.7, is only about 21.5, based on the mine loads, assuming that Minto and Carmacks Copper are connected as it was laid out in the original document.

In comparison to capacity on energy, the base case would show ongoing surplus hydro through most of the 20-year period. There would be some peaking diesel required but it is less than 10 gigawatt hours a year until 2020, which is a fairly small component of the system.

With the mine loads that diesel generation -- as the mine loads existed at the time the Plan was written, the diesel generation required about 40 gigawatt hours by 2016, after which the mines at that time were planned to close.

Now, I am going to try to go quickly through two graphs that show a template for images that are used routinely in the Resource Plan, and these only show the base case. All of the different variations on each of the load scenarios and each of the projects that arise and are proposed on the Plan, are shown in Chapter 4 and in Chapter 5.

The first graph is based on capacity. It

shows the current capacity of the system in the darker area at the bottom, and it shows in the -- in the dotted lines that are sloping upward through -- as one moves on in the graph upward to the right, the capacity criteria that must be met. Both the N-1 and the LOLE criteria are listed, and it is necessary for the system to address shortfalls from the higher of the N-1 or the LOLE criteria. So in this case, it is seeking to install enough capacity to meet the highest of the dotted lines.

The graph shows a period of 40 years. The vertical line down the middle is the 20-year period, so that is the 20-year Resource Plan horizon and the subsequent 20 years. And it emphasizes how much of the capacity issue that we are facing today revolves around the diesel retirements, which is the drop in the dark area in the first number of years, as opposed to the load growth, which is the line that only slopes up relatively modestly as one moves through that next six-year period.

In contrast, the second graph, which on this screen has two dark areas, shows the energy on the system compared to capacity. And as Mr. Osler set out, the energy on the system today is not a

constraint. The lowest area on the system is the hydro that is being used, it is green on this graph, is the hydro that is being used to supply firm loads, and the gray area that starts about midway through the graph is the diesel that will be required under the base case scenarios. There is another lighter green area that shows hydro being used to supply secondary energy, and that tapers off once diesel starts to be required pursuant to the rules for secondary energy, and it emphasizes that in contrast to capacity, where investment is needed in the very near-term, there is no need for investment to displace diesel or to enhance the overall hydro base -- the base hydro output, long-term average hydro output, in the planning horizon, under base case loads.

There is some diesel beginning to show up in the 20-year period, it is quite a sliver on this graph, but it starts to represent a reasonable amount of costs for the diesel generation, and that's where the opportunities arise in relation to projects like the Aishihik Third Turbine, that can help with peaking and help to avoid that sliver of gray diesel more than enough to offset the costs of the project, but it is not a substantial new generation as one would be looking to in the second

20 years of this period.

MR. OSLER: Madam Chair, that gets us sort of the framework to start dealing with the four projects. It is about a quarter to the hour, and I wonder what your pleasure is.

THE CHAIR: That gets us a little bit more on track. We did get started late this morning. Perhaps we will put the break off, and Mr. Landry, would you have any comments and proceed with swearing in the witnesses and we will proceed with the cross-examination after our break?

MR. OSLER: We were going to keep going through the rest of this presentation, but how do you --

THE CHAIR: Oh, I see. How much more time do you have?

MR. OSLER: I would think it is 15 to 20 minutes to finish the presentation.

THE CHAIR: Then let's proceed with that.

MR. OSLER: I would just emphasize that all of the material we were just talking about was the WAF system which is the focal point of this type of detailed analysis. Mayo-Dawson system has surpluses on it that we are not focusing on at this level of detail, and each system is planned on its

own because it has to be.

Looking at the near-term requirements, we have said that the capacity criteria, the planned retirements, the ongoing load growth and the potential to service new mining loads are what are driving this, and we put forward four major options which are on the next slide, 27.

This slide has been updated. I would just say it lists the four projects that we put into the original submission. It lists the firm WAF capacity that each one of them could contribute, it lists other benefits that they could provide in terms of energy and displacing diesel down the road, and in each case, lists their estimated capital costs in 2005 dollars. We have not updated anything to do with the Aishihik Third Turbine, so the information stands. Marsh Lake has been withdrawn so it doesn't exist anymore, and that means 1.6 megawatts of capacity, that we were expecting to try and get in the near-term, we will not be relying on.

The Carmacks-Stewart transmission project is very active. The cost range has been updated to the range of 30 to 40 million dollars in 2005 dollars, with a midpoint of 35.4 million, updated in Exhibit B-16.

The Mirrlees Life Extension has gone through various updates and confirmations. In the latest update filed November the 9th, B-16, we talked about 5 megawatts at Faro, additional Mirrlees that could be extended or refurbished that has been retired in the past, so we are talking now 19 megawatts and not 14, under this category; and we are talking about a cost of $8.7 million, in 2005 dollars, rather than 6.4.

Looking at each one of these, the Aishihik Third Turbine -- the next slide -- the Aishihik Third Turbine is a $7.2 million 2005 project. It already has licences in place from the water licence. We have done detailed economics we provided in Appendix C. Because of the Aishihik transmission line issue that we have been talking about, though, adding 7 megawatts at the end of that line does not increase our firm capacity to meet the needs of the rest of the system at Whitehorse. In fact, it adds zero to the solution of that problem. So why is it in the plan? Because, if we look over the next 20 years, we see peaking diesel use on the system growing, and particularly if the mines are connected. And what this unit will do at Aishihik is displace the use of that peaking diesel, enough to provide economic

benefits in the near-term, and in the long run, we have always known that putting the third turbine in at Aishihik would lead to efficiencies in getting more energy out, per unit of water at Aishihik, for reasons that we can go into. So it has long-term benefits that have always been valuable, but what accelerates its use in the near-term is the extent to which we foresee peaking diesel operation on the WAF system.

Appendix C lays out tables that show, under different scenarios, how much diesel use we see each year on the WAF system, either peaking or base load diesel. And you can see, by looking at that appendix, how the usage jumps if you have the mines. And what we have said, in effect, is the timing of this plant, this extension, will depend on the load, and, if we connect the mines, there will have great value to it.

Appendix C also dealt with variations to do with Marsh Lake. Essentially, Marsh Lake did some of the same things for us. Taking the Marsh Lake project out enhances the value of Aishihik, and, if anything, accelerates its timing.

I would also say that the Appendix C material goes right back to the original January document. It assumes only 14 gigawatt hours a year from

Minto, rather than the 32 1/2 we are now talking about. So, if anything, the combination of the two mines would put more energy load on the system than we were assuming throughout all that analysis done last January.

Next slide, Marsh Lake, the update that we filed, B-16, has removed this project because we cannot see any way that it could be done in the timely way that was assumed to be a benefit in the near-term. So in essence, it is taken off of the shelf -- put back on the shelf or taken away. We are not pursuing it.

The next slide deals with the Carmacks-Stewart transmission project, the cost of which is now 30 to 40 million in 2005 dollars, or 35.4 million midpoint, due to the update. We have provided additional information, since this was done, in answers to the YUB Round 2 question Number 21 and a considerable amount of new information in the update highlighting the extent to which, since we filed in June, we have had considerable consultation with the Northern Tutchone First Nations. We have had a YESAB filing that has a selected route and all the details required for the environmental and socio-economic review and licensing. The Minto mine has now secured $85

million of debt financing, as required, to continue with its construction, and it is over one-third completed to start operations in the second quarter of next year. And with all of those things in mind, Stage 1 of this project to Pelly Crossing at 138 kV is the firm proposal that Yukon Energy has set out in its update filed November 9th, and we have set out the updated economics there as to that project.

I would emphasize that when we go to Pelly Crossing, we don't get the benefits of extra capacity from the Mayo-Dawson system, or extra energy off the Mayo-Dawson system. Stage 2 has to be completed to get the extra 5.6 megawatts from Mayo-Dawson, or the 15 million kilowatt hours a year that we look at potentially being available. That assessment is subject to the loads on the Mayo-Dawson system, in particular whether United Keno Hill Mines comes back in the near-term as an active mining operation.

We are currently proceeding with a schedule that has been set out in the update, that would see a start of construction targeted for next summer or fall after receipt of all the licences and approvals from the YESAB process.

Next slide, Mirrlees Life Extension Project

has gone through numerous updates, including the one I just noted, that in the update we just filed, B-16 -- the note -- we noted that the company has looked at the Faro-Mirrlees, now, as being another unit that could be brought back into the system. Effectively, that would add 5 megawatts of capability that we have not even assumed before, at a cost of about 2.3 million. We have noted that there are options that we are in due diligence pursuing for that particular site, namely any other used diesels that could offer the same benefits at the same costs, with some other advantages, such as potentially some used EMD units.

The key point about the diesel units, as we set out in response to YCS-2-E6, is that they are there for back up, they are not expected to be run a great deal. They are not going to have great environmental emission issues. They are cost-effective ways of providing the capacity capability that we see the system needing in order to meet peak loads. But in most situations, in most years, we would not expect them to be running, and certainly not running very often.

We have also noted, in our updates and material filed, various other long-term plans for the Whitehorse diesel plant which we can answer

questions about. Essentially, we are following a staged approach to these diesel unit items. With the update, we would start with the Faro unit because it is not running any risks of affecting the system's capability while we are working on it, then we would do the Whitehorse units in the order talked about, but one year later than what was in the original plan.

Finally, the next slide, looking at Whitehorse diesel contingency, we always know that there are issues that some projects may not proceed and may not proceed on the time element and what were the contingencies. The plan laid out contingencies with respect to the Whitehorse diesel capability to expand. They are noted in the slide. We have actually found another way to expand capability beyond what we talked about earlier, namely, the 5 megawatts at Faro, which effectively adds 5 megawatts we did not have in the plan and more than offsets the removal of the Marsh Lake project.

I would say that Aishihik twinning has always been a concept that we took very seriously, given the problems laid out in the capacity criteria of the connection between Whitehorse and the Aishihik plant. The most logical project you would think of pursuing would be to twin that line in order to get

the redundancy needed to get your full benefit from the 30 megawatts you have there and, furthermore, the additional seven you are planning to add and perhaps with re-runnering capabilities even more.

We looked at it; the problem is cost and timing. If we have capability on the system in the near-term, through the Faro units or other units we are looking at, the timing issue will at least be addressed in the sense that we are not worried about how long that project might take to develop and how we look after the system in the near-term. The cost issue remains, as to at what stage in the development does it make sense to do economically. But it is not something we are ignoring and I am sure we will talk about it during the hearing.

The only other option that we have noted in the contingencies is in dealing with the Minto mine. They will have 6.4 megawatts of diesel that they will have installed, because they are going to be running on diesel when they start up, and that 6.4 megawatts of all the diesel units that they have on site will be surplus once we start to connect to them. And they have put to us the question, would we see any use in having them around for a few years or not; otherwise they we get rid of them. So that becomes an extra

contingency possibility that we are looking at.

Finally, looking at the longer-term, next slide, or next couple of slides, Chapter 5 or Part (b) of the Minister's letter, dealing with the longer period to 2016. Very quickly, there are a very wide range of mine options. Mines vary from five to 20 years in terms of their life, their peak demands vary from two to 20 megawatts, and the distance from the Yukon grid is anywhere up from zero to 273 kilometres. They present opportunities but it is very difficult to plan for them.

We went through, on the next slide, the various things that can change from an industrial customer point of view. In many cases, the mine is not really dependent on getting access to our power. The Minto mine is a classic example. It can start up without us. It can save money by having connections to us. Some mines are very short-lived. Minto and Carmacks Copper are not, at the moment, more than seven or eight years, for sure, if they were developed. But likely Minto's case could be ten years plus, what they are talking about, but they are not 20 years.

Customers may get value from the heat on the site. If they are running a diesel unit, they may see some value to the heat. From our point of

view, Yukon Energy, the problem of long lead times to do things, if we are developing new resources, and how to mesh that with what the mine is doing, if there isn't a grid connection, how do we proceed on that basis? And the whole risk issue which is laid out at page 36 of the overview with respect to the history of Whitehorse 4 and how it could have been very different if the Faro mine -- that unit's economics might have been disastrous if the Faro mine had not come back in the late '80s.

And, finally, this document shows that some of these project options get into scale range of size that would challenge Yukon Energy's capability to finance and deal with them, and would have to look at partnering or other options to deal with the scales.

The longer-term -- next slide, the longer-term framework, when we are dealing with new industry, obviously we are talking about paying the full cost of service in accordance with the Order-In-Council. We are looking at the opportunity to sell surplus hydro when it exists, and the benefit that would come to the Yukon ratepayers or the Yukon Government, for that matter, if it still got the Rate Stabilization Fund. We have to consider the normal obligation of

the utility to serve these customers, and when that applies and doesn't apply. And we look at these opportunities, as has happened historically with NCPC, to develop new capital infrastructure that, 20 or 30 years from now, people in Yukon can look back, as we are looking back, and say those assets developed with those mines are now giving you cheaper power than anybody else north of 60. So that is the industrial framework.

The next slide, we are matching opportunities, what does this mean? We have lots of graphs in the document that try and show this. We are looking at matching in terms of technology, obviously, we are looking at loads, obviously, we are looking at load length, time period. And what we have come to the conclusion is that, up to 10 megawatts, we don't need new energy, there is no real opportunity for new hydro. When we get up to 25 megawatt loads, or the range that the Faro mine was at, given the load growth that has happened since then, there are probably opportunities for seven to 10 megawatts of new capability of hydro generation of up to 50 million kilowatt hours a year. If you got some of the bigger mine loads coming on that have got some good life to them, 40 megawatts, there could be capability for 100 - 150 million kilowatt hours a

year of hydro. And the pipeline examples are so large that they are into another sphere, entirely, of discussion.

Of the action plan laid out in the next slide, up to 10 megawatts we had focussed on existing hydro system enhancements. If sustained, if we can seen a sustained level of load, rather than falling off as we thought it would, we would consider one to four megawatts of new hydro and DSM. Once we get up to the point we are not having the hydro surplus, we can look at DSM seriously again, we can look at system enhancements, plus other new generation of seven to 10 megawatts, and potentially wind. At the 40 megawatt level, as I said, we can start planning new generation of up to 20 to 30 megawatts, but there is not sufficient likelihood today, in our view, to actually get on with that. The pipeline would consider capability to serve loads, joint venturing, federal government participation and, of course, the issue of a new source of energy, gas, to meet Yukon needs.

The final slide, on the pre-commitment activities, prior to the certainty of development on loads, Yukon Energy will carry out certain things: it will keep close monitoring of the loads; it will look at the Southern Lakes

hydrology; it will assess other hydro facility improvements; it will look at ongoing monitoring of the hydrology for credible sites of less than 30 megawatts; and look at Level 1 and Level 2 assessments, which are sort of up to the pre-feasibility stage of potential five to 30 megawatt hydro sites.

The costs involved, of major developments, can be several millions of dollars, 10 percent of the ultimate cost, just for planning, before it is actually approved. And we talk about balance and risk management ... that is what is involved in trying to figure out how far you should go with those projects.

That, Madam Chairman, is within the hour to the dot.

THE CHAIR: Pretty good actually, pretty good. Mr. Landry, do you have some comments you would like to make before we take a 15-minute recess?

MR. LANDRY: Madam Chair, I just have some technical things for the record, which would come after the witnesses are sworn, and also I have two or three questions of Dr. Billinton, so I am at your pleasure. We can do that now or we can do that right after the break.

THE CHAIR: I think we will have a 15-minute break so that means we will come back just around 12 or 13 minutes after 11:00.

(Proceedings adjourned 10:50 a.m.)

(Proceedings resumed 11:22 a.m.)

THE CHAIR: Mr. Landry, would you like to proceed?

MR. LANDRY: Yes, Madam Chair. I wonder if we could have the witnesses sworn and then we will go from there.

YEC PANEL SWORN:

DAVID MORRISON, SWORN

CAMERON OSLER, SWORN

HECTOR CAMPBELL, SWORN

PATRICK BOWMAN, SWORN

ROY BILLINTON, SWORN

YEC PANEL EXAMINED BY MR. LANDRY:

MR. LANDRY: Madam Chair, my apologies, it probably should have been me who suggested the witnesses be sworn before this morning, and I just have a few questions I want to put on the record for that purpose.

Q MR. LANDRY: Starting with you, Mr. Morrison, I assume you are familiar with the Resource Plan, including the updates and the various answers to Information Requests that have

been made?

A MR. MORRISON: I certainly am.

Q And to your knowledge, is the information that has been provided in those materials true and accurate?

A Yes, it is.

Q And do you adopt that information as your evidence in this proceeding?

A I do.

Q And, sir, the information that you provided in your opening remarks, was that information true and accurate?

A Yes, it was.

Q And do you also adopt that as your evidence in this proceeding?

A I do.

Q Mr. Osler, you are familiar with the Resource Plan and the various updates and the information responses to the IRs that were provided by the Board and the intervenors?

A MR. OSLER: Yes.

Q And to your knowledge, is the information provided in that material true and accurate?

A Yes.

Q And do you adopt it as your evidence in this proceeding?

A Yes.

Q And, sir, the information that you provided in your presentation this morning, was that information true and accurate?
A Yes.
Q And do you adopt that as your evidence?
A Yes.
Q Mr. Campbell, you are familiar with the Resource Plan, the various updates and the responses to the Information Requests that were provided in this proceeding?
A MR. CAMPBELL: Yes, I am.
Q And to your knowledge is the information that was provided in that material true and accurate?
A Yes.
Q And do you adopt that as your evidence in this proceeding?
A Yes, I do.
Q And, sir, the information that you provided in the presentation this morning, was that information true and accurate?
A Yes, it was.
Q And do you adopt that as your evidence in this proceeding?
A Yes.
Q Mr. Bowman, you are familiar with the Resource Plan, the updates and the Information Responses to

the IRs that were provided in this proceeding?

A MR. BOWMAN: Yes.

Q And to your knowledge, is the information that was provided in that material true and accurate?

A Yes.

Q And do you adopt it as your evidence?

A Yes.

Q And the information that you provided this morning in your presentation, was that information true and accurate?

A Yes.

Q And do you adopt that as your evidence?

A Yes.

Q Now, Dr. Billinton, I know that you were only involved in the information relating to the capacity planning criteria and the Resource Plan and the updates and the various Information Requests; is that correct?

A MR. BILLINTON: Yes.

Q And the information in relation to that, to your knowledge, is it true and accurate?

A Yes.

Q And do you adopt that as your evidence in this proceeding?

A I do.

MR. LANDRY: Madam Chair, I do have

a couple of quick questions for Dr. Billinton, specifically on the capacity planning criteria, if I may be allowed to go ahead with that.

THE CHAIR: Please proceed.

Q MR. LANDRY: Dr. Billinton, you were engaged by Yukon Energy as indicated by, or testified to, by Mr. Morrison. In general, what were you asked to do on behalf of Yukon Energy?

A DR. BILLINTON: My colleague, Professor Karki and I , were engaged by Yukon Energy in late 2004 through a contract with the University of Saskatchewan. Our scope of work included reviewing the existing YEC generating capacity adequacy planning criterion, identifying and developing suitable reliability models for the WAF grid, and for conducting a probabilistic analysis of the WAF grid generating capacity, and that basically was the constituent elements in our scope of work.

Q And, sir, you have obviously reviewed the capacity planning criteria that has been adopted by Yukon Energy?

A Yes, we have.

Q Now, sir, in your view, given your experience, is that criteria reasonable for the Yukon systems, particularly in light of similar planning criteria used elsewhere in Canada?

A Yes, I think it is quite reasonable. It is understandable and straightforward. It lies, I think, in the range of planning criteria that are used elsewhere in Canada. And it, of course, relates directly to the criteria that are being adopted in the Northwest Territories for a very similar system. So, therefore, I think it provides a very practical and reasonable framework upon which to conduct adequacy evaluation.

Q And were you involved in the Northwest Territories' situation?

A Yes, I was involved in the Northwest Territories latest hearing. Prior to that time, I was involved working with the Northwest Territories to establish their criterion, so I had full involvement, perhaps over the last decade, in that particular activity.

Q Now, I wonder if you could just comment on the need for two criterion. What I mean by that, for the purposes of the record, is the N-1 criteria and the LOLE criteria, as opposed to just having one criteria?

A First, the LOLE approach provides an overall assessment of the capacity adequacy. It is a well-known approach. It is used by many utilities. And it does respond to the fact that it influences the reliability of the system. That is

what you are looking for is a technique that will then take into account the salient features of the evaluation and then proceed to respond in terms of the risk index that is produced. So the LOLE, I think, is a standard and is fully observable.

The vulnerability of the Whitehorse area load to the loss of the Aishihik generating capacity is clearly illustrated, I think, in our February 2005 report. And I think all of you are probably even more aware than I am of the incident that occurred on January the 29th, which rather dramatically illustrated the vulnerability of the Whitehorse load to the loss of the Aishihik line. So therefore the dual criterion, the N-1 criterion, provides a measure of response to that particular possibility, and therefore I believe that the two criteria provide a balanced approach which is necessary in this particular case.

The configuration of the WAF system is very similar to the Snare-Yellowknife system. It is quite different than many systems that you see in the southern part of Canada, where there is considerably more redundancy associated with generating capacity facilities, and therefore I think the dual criteria is a very practical approach. There is a need for both segments, that

is the LOLE approach and the N-1 criterion, and I think it provides the opportunity then for planning in a careful and measured way.

Q Now, sir, in the interrogatories that were sent out by the Board Staff, they had asked about a different form of criteria based on -- and for the record, LOEE, or unserved energy, as I understand it, sir. What is the difference between the two types of criteria, the LOLE and the LOEE?

A One of the difficulties with acronyms, of course, is that everybody uses them and everybody is happy with the ones they use, and you start to use them like words as opposed to acronyms.

The loss of load expectation, the LOLE, is a very common criterion. But first I would just like to comment on the word "expectation" for the purposes of an explanation to the Board.

"Expectation" does not mean to "expect". "Expectation", and I think Mr. Bowman referred to this, means the long run average value, and therefore you are talking about-- it's mathematical expectation actually, and therefore you are talking about an average on a long run value. So LOLE is the expected -- and I am using it in the mathematical sense -- number of hours in a year that the load will exceed the generating capacity.

Now, there has been a lot of attention paid to peak load, but in actual fact, it is every hour. It is the load at every hour of the year that is taken into account when you are looking at, then, the expected number of hours that the load would exceed the available capacity.

Now, LOEE is loss of energy expectation. So that "E" on the end is "expectation" again, and that is the long run average number of kilowatt hours, or units of energy, that would not be satisfied during the course of a year. So one deals then with hours, and the other deals with energy.

Now, the bulk of the applications that you see around the world, the loss of load expectation is by far the more common. The loss of energy expectation is a good index, it has been used in numerous situations, but the loss of load expectation is by far the most common index. I think it is understandable. It is relatively easy to calculate, and as a result, I think it serves the purposes that you are looking for.

So they are both good indices, but the loss of load expectation is by far the more common. It is used in our report with this little table that shows what Canadian utilities use, and the LOLE

index is used and useful, and I think it would serve the purpose in this particular case.

MR. LANDRY: Thank you, Dr. Billinton.

Madam Chair, those are the questions I have for Dr. Billinton, so that is the end of our presentation and direct.

THE CHAIR: Okay, great, that was fast.

Ms. Marx, are you aware of any matters that are presently before the Board?

MS. MARX: No. I think we can begin with questioning by the intervenors, Madam Chair.

THE CHAIR: Mr. Pinard, are you prepared to proceed with your cross-examination?

MR. PINARD: Yes.

THE CHAIR: Then please proceed.

YEC PANEL CROSS-EXAMINED BY MR. PINARD:

Q MR. PINARD: Hello. This is the introduction to YCS's concern with Yukon Energy and their 20-year plan. As you are aware, many utilities, states and provinces across North America have taken the initiative to reduce carbon emissions within their jurisdictions. In the Yukon, we have done only small measures that do not

significantly reduce emissions. In a way, we are blessed with two utilities that provide mainly renewable source of energy, but as a whole, Yukon still burns fossil fuel for their home heating, electricity in remote communities and for transportation.

Yukon Energy could be taking advantage of its excess hydro power to reduce emissions in those sectors. In YCS's opinion, we don't see a 20-year plan. We don't see the demand side management, a policy thereof, we don't see Kyoto provisions, we see no alternatives to diesel, no opportunities for independent power producers, which include First Nations, and no innovation.

Now, the next sections, there will be some points we make and we will be asking some questions.

For Marsh Lake, in YCS-YEC-2-D1, this is YEC's response to our questions, in regards to wetlands and shoreline erosion studies, could you tell me where the preliminary work that was done by YEC's consultants during September of 2006? Can somebody answer that for me?

A MR. MORRISON: Just on a point, you do understand we are not going ahead with Marsh Lake?

Q Yes, I do. But you had stated that there was some

consulting --

A And we had some consultants do some work, and we -- that was part of the decision not to go forward, though. I am not sure what the question is. Do you want a copy -- is this -- are you asking for a copy of this information?

Q Yes.

A Or what did it tell us?

Q Yes. Apparently you had done some consultation work in regards to a Marsh Lake study, to find out what the impact would be on Marsh Lake, and this is what we would like to see.

Has anything of that nature been done in terms of wetlands impact and property impact? Was there any study done, at all, on that?

A We did some very preliminary work which I am not sure, on its own, is informative in the sense -- just coming from the perspective of, (a), we have decided not to go forward. It is very preliminary. We did not complete any wetlands studies if that is what you are talking about. We certainly did some quick initial investigations.

Q Okay.

A We had some -- as you know, we had some consultations with residents, and, again, we did not go any farther than that.

Q Okay, thank you.

It is our opinion that, although you have dropped the Marsh Lake plan from your immediate plans, we feel that you should include it as part of your 20-year plan, and it should be -- well, basically, that is what I am saying. Yes, it should be part of your 20-year plan. So in terms of immediate, that is fine, but, long-term, it should still be there.

Now, questions regarding industrial customers, in our YCS-YEC-2-A6, could you define what is an industrial customer?

A MR. OSLER: In our submission, we have used the definition in Order-in-Council 1995/90, I believe, which is -- I forget the exact words, but -- well, okay:

> "A major industrial customer means a customer engaged in manufacturing, processing, or mining, whose peak demand for electricity exceeds 1 megawatt, but it does not include an isolated industrial customer."

An "isolated industrial" customer is one that would not be on any one of the grids. Right now Minto, if it started operations in the spring of next year, would be an isolated diesel operation but not

a customer of any utility. If, for some reason, the utilities had a contract to supply the diesel to that mine, it would be an isolated industrial customer, in the definition as used here, and would not be taken into account in planning costs for ratepayers in Yukon. An isolated diesel customer is treated totally separately. But a major industrial customer is one who is on one of the grids and therefore gets incorporated into the Order-in-Council's requirements as to how you should set a rate for them.

Q So, does YEC have any contracts or are in negotiations for a future industrial customer?

A MR. MORRISON: Well, at the moment, we have no contracts with industrial customers, but I think it is clear, and we have outlined in the Plan, that we are in the process of negotiating with the Minto mine to provide service to them, and we are in discussions with them regarding a power purchase agreement.

Q So my next question here is, have you negotiated a rate or are you intending to?

A Well, I will let my friend, Mr. Osler, jump in on this, but essentially, from our perspective, rates are the purview of Yukon Utilities Board, and that is not something that we would agree to on our

own. If we had discussions with Minto, or any other industrial customer about a rate, it would always be subject to the Yukon Utility Board.

Cam, is there anything you want to add?

A MR. OSLER: In essence, I think the documents we have filed have said that any rate would have to be approved by the Utilities Board, number one, which is just the law, if they are going to be on the integrated grids. And it would have to comply with the Order-in-Council I just listed. It would have to make sure that the rate at least equaled the cost of service for that customer class, that major industrial customer class, calculated on a Yukon-wide basis, the way it was done for the Faro mine.

Beyond that, I would say that, in negotiation, we are focused mostly on terms and conditions for their being connected, and the responsibilities and costs that they would secure for us in developing transmission. The issue of rates does come up, but what I have just said is the condition that exists. Any rate, if somebody wants to discuss a given rate, it would have to come to this Board for approval.

Q Has YEC considered demand side management for this particular potential customer?

A MR. MORRISON: Well, I think, Madam Chair, consistent with what we have been talking about through our revenue requirement hearing rate last year, and I think which is quite evident in this plan, it is difficult for YEC to consider demand side management when we have a significant hydro surplus on the system. I am not sure that we could make the case before this Board to carry out expenditures on demand side management initiatives when we have a hydro surplus. And, Cam, you can add if you like.

A MR. OSLER: I think you asked for this particular customer, if I heard you. Were you meaning a Minto customer?

Q Yes. It applies to them immediately because they are the first ones to come on line, most likely, but there will be future customers.

A But looking at Minto as a mine, for example, they are going to be paying through the nose for diesel fuel. They have every incentive in the world to be efficient in their use of energy. And they, secondly, are very, very busy trying to get on with the job of doing mining. So we have not discussed with them, for example, I do not think we would be able to discuss with future mines, the type of question you are raising. Where you can get into

demand side management with industrial customers is with somebody like Inco in Manitoba, who has been there for a long time and is going to be there for a long time, and have people who will pay attention to that, rather than worrying about getting a mine established, for five years, seven years or ten years. It is not an easy thing to do. But I would assume, in principle, that if anybody has got an incentive to save costs on use of energy, it is a mine that is going to be running on diesel at today's diesel prices.

Q I guess related to that is if we are -- when the mine does come up, and we are assuming we are connected to the mine, and we are running into the winter peaks, then who is going to be starting their diesel generators in the winter; will it be us or will it be the mine?

A MR. MORRISON: Madam Chair, I think this is a good opportunity to be very clear about capacity and capacity-planning criteria, and the ability of us to serve industrial customers under that capacity criteria. I think it was mentioned earlier, and this is just an opportunity, I think, for us to be very clear. If the mine is connected to the grid, and we have a requirement to -- a power outage, as you might say, similar to what we

had last year, and there is a necessity then on our part to look at starting our back-up systems, we would look at the industrial customer the same way we do the secondary sales customers, and the industrial customers would be disconnected from the grid, in a back-up situation. So we are in discussions with the Minto mine, have made that clear to them, and they will have their own back-up source of supply. I think as Mr. Osler mentioned earlier, initially the Minto mine is going to have their own diesel, so they are going to have a system sufficient enough to not only generate by diesel but also to back up that generation, so they will have, at least at the outset, a fairly substantial diesel supply. It is our clear policy that large industrials are the same as secondary sales customers, if we have an emergency, they will be disconnected from the grid and responsible for their own power.

Q Okay, thank you.

Now, moving on to the next topic, customer use patterns. In YCS-YEC-2-B1, this is related to that, there is -- there has to be better cooperation with YEC and YECL. YECL should provide customer use patterns, this data could be critical for DSM. It is almost unbelievable that the

20-year plan does not address customer use patterns. For industrial customers or those customers who use a lot of power, such as hotels, why not charge less in the summer, since you have surplus hydro, and why not make the most use of it? In converse, it is to charge more in the winter when the possibility of using diesel is more likely. As you know, electric baseboard are starting to creep, I don't know if you are aware of this, but they are starting to creep back into new developments, and so there is no real control or incentives or disincentives to make people change that kind of a behaviour. So a possible future customer is also the lower bench of Porter Creek, and we just had a charette last year -- last week, and talking potential of having 5,000 to 10,000 new residents in that area. So, having any design scenarios -- have any design scenarios been done for this kind of development, which could involve district heating? Because this could be a major secondary power revenue source. So have you done that kind of study for a subdivision like that?

MR. LANDRY: Madam Chair, if I could just before they answer, and I am not trying to be critical of Mr. Pinard, but there was an awful long preamble there and a number of questions within the

preamble so it is not that I am -- I just want to make it clear that I guess what Mr. Pinard is asking for is an answer to the question at the end as opposed to various things in the middle, just so that the record is clear.

THE CHAIR: Mr. Pinard, would you like to clarify your question?

Q MR. PINARD: I will clarify the first question, then. So why not charge less in the summer, when you have surplus hydro, to customers like hotels?

A MR. OSLER: That is a broad question of rate design. Generally speaking, the answer at the moment is, if we charge less in the summer, we have got to charge more in the winter, and, when the system is in its current configuration, it hasn't seemed to make sense to do it, it did not seem to provide much basis for any efficiencies to be gained. If the system was running on diesel all the year around, as it was at the time of the Faro mine, there wasn't a great deal of efficiency to be gained there either. And when you are caught in between those two situations, you are in transition, either going one way or the other.

Now, this is a topic that, in rate design hearings, I am sure will continue to be raised, and

we just have not addressed it in the context of this Resource Plan because we are not getting into rates as an official issue. I guess when we did the 1992 plan, when we had diesel on the margin all year around because the Faro mine was operating, we certainly spent a lot of time and effort on DSM, and on how the load forecast might be adjusted for DSM measures. We do have DSM measures right now, given the situation, they are called secondary sales, to try and promote the use of electricity to displace fossil fuels in heating situations, in commercial situations. So that is a form of recognized DSM in a situation of surplus hydro in the context of Yukon and, frankly, many other hydro-based utilities such as Manitoba, I think B.C., so many people talk about but have not yet implemented for some of the reasons I just gave you.

Q Sorry, your microphone is losing out.

THE CHAIR: I'm sorry, I can't hear you very well.

Q MR. PINARD: I cannot hear you very well anymore.

A MR. OSLER: Oh, what happened?

THE CHAIR: Can you hear better now?

MR. PINARD: Yes.

A MR. OSLER: Now, are you going to go down the list of questions.

Q Yes, just the Porter Creek as an example, the lower bench of Porter Creek as an example of a new, sort of large-scale development, and how you would deal with that new energy scenario.

A MR. MORRISON: Let me be clear that the Porter Creek development is not one where Yukon Energy would be directly involved. Porter Creek is a customer or a customer area served by Yukon Electrical. I don't know what went on at the charette last week, so you are asking me a question about which I don't have any background. We do look, and we have looked extensively, at load forecasts. I do not know what time period you are talking about these five or 10,000 homes in, but that size of a development doesn't show up in our load forecast in the near future.

Q Moving on to independent power producers, will YEC have an IPP policy in the 20-year plan?

A I think it is fair to say that we will move towards the development of an IPP policy within the next few years. Again, we have not had any need in the past to address the issue of IPP. I would say to you that, without a policy in place, we don't have

a policy that has any indication or indicates in any way that we would not cooperate or deal with an independent power producer if one came forward. At the moment -- and we have had instances in the past few years where people have approached us and said, you know, I have this idea, and you know, what do you think about it in terms of power, and our response has been very consistent and very straightforward, we have no -- we have no need at the moment to buy additional generation capacity or energy in that sense. So, you know, we have a surplus of energy on the system, and if somebody wants to build a new project to sell us some energy, we have a surplus, so there is no requirement at the moment to deal with the issue. Now, I think, as you see in the Plan, the system is -- the system use is growing, and we have mentioned, I think it was mentioned earlier, you know, the peak is growing about a gigawatt hour a year, but we are not -- we are by no means in a position where we need additional energy at this time, and if someone brought us a proposal, we would certainly look at it.

Q Is YECL considered an IPP?

A I do not know. I have never had them bring us a project.

Q Utilities Commission Act, that is based out of B.C., Utilities Commission Act was amended in 2003, the provincial government's November 2002 energy policy called its title "Energy For Our Future, A Plan For B.C.", made amendments to Section 45 of the UCA, which is the Utilities Commission Act, and in Section 45 it states here that a public utility must file the following plan with the commission in the form and at the times required by the commission, and there are three points, but two that are more important here; 45(b), a plan of how the public utility intends to meet the demand for energy by acquiring energy from other persons and the expenditures required for that purpose; and 45(c), a plan for how the public utility intends to reduce the demand for utility, and the expenditures required for that purpose. This is just for your information.

Now, please refer to YEC's response to the YCS intervenor, that's YCS-YEC-2-C2, that was the one dated October 13th. Now, in reference to page 2-12, line 8 onwards, regarding independent power producers. The question was, does YEC have a policy on the price that it will pay for power generated by independent producers, and what the price calculation is based on? And the answer is

no, YEC does not have any standard price it will pay for power generated by IPPs given hydro surpluses on each of YEC's major system. YEC has no practical opportunities to purchase IPP power. In the event that diesel generation was on the margin or one or more of the major systems, YEC would need to consider various matters related to pricing as set out at Section 5.3.1.4 of the Resource Plan.

Yet, on page 9 of the Resource Update of November 2006, there is the following: Yukon Energy and Sherwood Copper continue to negotiate the PPA pursuant to the LOI, focussing on assumed development of Stage 1 CSMS project to Pelly Crossing at 138 kilovolt from Carmacks to Pelly Crossing, and including consideration of YEC's potential use, after the project is in service, of the 6.4 megawatt surplus on-site diesel generation.

Could you clarify what that last statement means, the potential use of the 6.4 megawatt diesel at the mine site.

MR. LANDRY: Madam Chair, just once again for the record, there was an awful lot of preamble to that, and again, I am not trying to be critical of Mr. Pinard, but I am not sure I am in a

position I can tell you right now, to even agree or disagree with what he said about what has happened in British Columbia. So I just want to make a note for the record, that we are not-- that Yukon -- if what Mr. Pinard would like to do is to confirm that, I can tell you we are not in a position to confirm that at this point in time. But if he would like to ask a specific question like the end, I have no difficulty with that, it's just the preamble had an awful lot of information in there that I can tell you, at this point in time, if he wants confirmation of that, then I'll have a position on that.

THE CHAIR: Mr. Pinard, it is my understanding that you are asking for clarification on your last question?

MR. PINARD: Yes.

THE CHAIR: Could you please proceed with that question.

MR. PINARD: With the last question? Yes.

Q MR. PINARD: So the opportunity that seems to have arise in here is that there is an opportunity for a potential use of a 6.4 megawatt surplus on-site diesel generation at the mine site, and we are asking what does that entail?

A MR. OSLER: It is -- I put it this way, it is different than an IPP situation, and I will explain what I mean.

Minto is going to have what it calls surplus diesel at the site. Absent an arrangement with us, it will get rid of it. It will sell it on the open market, is its view; it is not going to keep it.

YEC, therefore, looks at it from the point of view of, is there a basis upon which it could acquire it or lease it or make any other arrangement so it would have availability to use it, and whether there -- and what value would YEC be interested in doing that, and is that value equal to what these people could get for getting rid of it otherwise?

I would just -- so that isn't really an IPP situation in the classic sense of the word, where somebody develops something to be sold to the utility on a long-term firm contract, effectively for the dedicated use of the utility but still owned and operated by the IPP. Probably, in this situation, to protect YEC's interest, we would look at ways where we would effectively control the unit and not leave it to the Minto mine to do, if we were going to use it. And it is purely, at the moment, an option to be considered, it has not

proceeded beyond that point.

I would add that Minto mine would have an additional capacity that would not be surplus, but would be retained at the mine site, to meet its emergency requirements in the event of lack of power from the grid. It would probably be in the order of magnitude of 500 kilowatts. It would not be a large amount of power. It would be enough to make sure that they do not suffer a catastrophe in the event of lack of electricity in their systems, but it would not allow them to run mining or milling operations in a normal manner.

A MR. MORRISON: Just to further clarify, I just want to make sure that we understand that all of Mr. Osler's remarks should be prefaced by the fact that after connection to the grid.

A MR. OSLER: Yes.

A MR. MORRISON: You know, we are talking about a situation that, if the grid is extended and they are connected, then the comments that Mr. Osler just gave us apply.

Q MR. PINARD: Well, so, in your response, so essentially this would be a net metering scenario, then. The customer can -- on average, a total -- the customer will use a total

amount of energy from you, but in some scenarios they will actually be selling back power to you, so this is actually called net metering?

A MR. MORRISON: No, I am going to let Mr. Osler add, if he wishes to here, but I think just to be, again, very clear what we are talking about is, initially, the mine intends to provide all of its energy requirements by diesel, and so they will have enough installed capacity there to be able to service their needs. Once they are connected to the grid, they will have a surplus of capacity out there, in addition to their emergency back-up requirements. What we are referring to here is, there is a need for YEC to examine that scenario and determine whether or not it might be in the system's interest, and our best interest, overall, to acquire that original capacity that they require to meet their own energy needs in some manner, whether that means buying those engines from them, or you know -- and actually that is probably the primary situation we are talking about here. So rather than them get rid of those engines by selling them to somebody, that we may buy them if there is, (a), an economic value there, and it is the best alternative that we have available to us. But we are not talking about net metering and

them selling us power, just to be very clear.

Q Okay, I guess what you are trying to do is setting some guidelines for this negotiation. Who will be providing the fiscal oversight for this?

A Of our negotiations for a power purchase agreement, just to be clear?

Q Yes.

A Is that correct?

Q Yes.

A The Yukon Utilities Board.

Q If Yukon Energy is going to take power from others, there must be a policy to ensure fair treatment of all potential providers, and a green power preference and an open call for proposals to provide power. This is sort of seen as a private deal in some ways, and I guess in light of this answer, it is good that it is going before the YUB and I would expect that it is, that it will be.

You talk about the need to provide cheaper power to make mines competitive, but if they have to buy more expensive diesel power to sell cheaper power and justify the line, then it becomes a false economy.

Now, are First Nations development corporations to be excluded because of a lack of an IPP policy?

A I am not sure what we are talking about here, to be very frank with you, because the question again has several aspects to it. But let me try to be clear about what I think we are talking about. We don't have an IPP policy, and that is clear for the record.

Again, as I said earlier, that doesn't preclude and doesn't mean that we would not look at IPP opportunities, that we have some particular bias to not having IPP projects go forward; we have none. If someone brought forward a project that -- and we required the energy, and it made sense from a ratepayers perspective, even without a policy, we would do what the right thing to do is, and the responsible thing to do is, and we would look very extensively at that opportunity. Hopefully we can get ourselves to a point where we develop an IPP policy that, again, as you, I think, were alluding to, provides a consistent framework for opportunity for everyone. We have no interest in trying to bias anything that we do. You know, I think our bias tends to be open and transparent as best that we can. These are decisions that our Board, the Board of the Corporation and the YUB, I am sure will have a great deal of involvement in. We routinely discuss issues with First Nation

development corporations of a wide ranging variety, based on our ongoing day-to-day business in the communities that we serve, certainly in the projects outlined in our Resource Plan. So I do not think there is any bias. I think clearly there is a misunderstanding that we are actually buying IPP type power from Minto, and, clearly, we are not, and I think that we need to look at exactly what we are doing, and then make decisions from there. But I hope -- I have tried to answer your question, I hope that is --

Q So YCS is urging Yukon Energy to create an IPP policy as part of their 20-year plan, and we would urge that IPPs are renewable.

Now, next section here is related to greenhouse gas emissions.

THE CHAIR: Mr. Pinard, I note that we are at a time that we had mentioned that we would break for lunch.

MR. PINARD: I don't have much left.

THE CHAIR: Can you give me an estimate of actually how much time you do have left?

MR. PINARD: Ten minutes at the most.

THE CHAIR: Then please proceed.

Q MR. PINARD: Related to greenhouse gas emissions, this is related to YCS-YEC-2-E2. Can you explain why you have allowed renewable power sales incentive programs to expire? We have asked about that in 2004 you have allowed that to expire, and why you have not pursued the other two initiatives that you have mentioned in your response to YCS.

A MR. MORRISON: Sorry, Mr. Pinard, we are just getting the reference, we will just be a second.

A MR. CAMPBELL: Yes, Mr. Pinard, the program you are referring to was related to secondary sales, and again the initial program was developed to encourage customers to displace some of their fossil fuel heating use. The primary reason the program was not renewed was the fact that Yukon Energy came before this Board last year, in the 2005 hearing, and modified the secondary sales rate, in our minds, in a way that ensured consistent savings would be seen by secondary sales customers, and the fact that the utility was also allowed, from that point in time forward, to make a utility investment, that that was enough of a signal to potential secondary sales customers, if they chose to basically fuel-switch, then that

there was no longer the need for an incentive program. The rate does it on its own.

Q Apparently the Chicago Mercantile Exchange trades CO2 emissions credit. Is it imprudent not to even explore the possibility of selling credits that might accrue, for example, taking Pelly off of diesel, or that is presently accruing from the Dawson City generators?

A MR. MORRISON: Well, I am not particularly aware that the Chicago Mercantile Exchange trades emissions credits. I am aware that there may be some discussion of emission trading out there, and my knowledge of the system, I am no expert, but I would say to you that if we thought there was an opportunity to trade some emissions credits, that we would look at it. I am not suggesting to you that we are doing that, but I am suggesting that if we thought there was a viable market out there, that we would certainly look at it.

Q So should not the 20-year plan look at using hydro to reduce fossil fuel demand in other sectors like home heating?

A I am not sure quite how to answer that, in the sense -- and the reason I say this is, particularly, if you look at the amount of surplus

available, and what we have done, I think, to attempt to market that surplus, home heating is a very costly, very expensive alternative, if you operate on the premise that you would have to make -- if we come back to your premise of consistency and fairness that you have talked -- that you talked about earlier, how do we address the availability of hydro to provide electrical heat services within every house, within every business, in the Territory. I am not sure that that is why we created the hydro projects. I would say to you, as well, that the development of new hydro is expensive. And I have not done the economics, but I can tell you, on the back of the envelope question, building new capacity to provide home heat sounds to me like a very expensive proposition, but maybe Cam would like to address it as well.

A MR. OSLER: Basically, when we did it in 1992, the issue was how to make sure people did not use electricity in Whitehorse and Yukon for home heating, because we had diesel on the margin, and it simply did not make sense to take a fossil fuel, put it through an electric generator and send it to a home in order to displace fossil there. The surplus, secondly, would not last all that long

from the point of view of trying to gear up a retail program with home heating. Secondary sales is as far as we have gone and that is only for commercial, because we know that the time period for the surplus has got limits to it and a great deal of uncertainty. It will vanish at some point within the next 20 years, probably within 15, but it may vanish a lot sooner. And if you are going to go to new resources, be they hydro or diesel, it probably doesn't make sense to try to develop what you are talking about. That should not be your primary approach to displacing use of fossil fuel in the home heating market, without commenting on what other approaches may exist to do that.

Similarly with the transportation sector, despite electric cars or hydrogen issues, if you want to go there, it is a much bigger problem than Yukon could address in a 20-year plan here.

Q This is just my closing statement.

What YCS is suggesting is that Yukon Energy should be cooperating with partners to look at new options, and we are talking partners like YECL, The City of Whitehorse, the Energy Solution Centre and EMR, and YCS and other interest groups. And in this cooperation, I am sure there would be solutions that would come out of such a

cooperation, solutions that you have not thought of here, and this would help in developing your 20-year plan.

I do not think we can have this 20-year plan all laid out right here before the Board, in this next month or so, but I think it should be done over the next couple of years as a part of a 20-year plan, to meet the growing energy demand. Because, as are you aware, eventually you will be using diesel in the end and you will have to look at options to increase your hydro capacity, but if you can avoid that by doing things like demand side management or taking advantage of any new hydro development to meet greenhouse gas emissions, to avoid things like the home heating, is one sector. But, please consider taking advantage of cooperation with other groups that I have mentioned. Thank you.

THE CHAIR: Mr. Landry, do you have any comments?

MR. LANDRY: No comments.

THE CHAIR: We will take a break now and we will meet back after lunch around 1:45.

(Proceedings adjourned at 12:15 p.m)

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