YUKON UTILITIES BOARD

YUKON ENERGY CORPORATION 20 YEAR RESOURCE PLAN

APPLICATION TO THE YUKON UTILITIES BOARD

Held at Gold Rush Inn

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BEFORE BOARD MEMBERS:

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| 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 |
| | Roger Rondeau |
| Yukon Conservation Society | J.P. Pinard |

TRANSCRIBER:

Doug Ayers Reporting Services

(Proceedings resumed at 6:05 p.m.)

THE CHAIRMAN: Good evening. Thank you for coming back on such a cold evening.

Welcome to the public input session in the oral hearing of the Yukon Energy Corporation's 20-Year Resource Plan. The Yukon Utility Board, as you know, will be submitting a report on its findings, as a result of these oral hearings, to the Commissioner in the Executive Council by January the 15th, 2007. The public input session is the opportunity for the Yukon Utility Board to hear comments from the public with respect to the Plan.

I would like to introduce the Board members. To my far right is Richard Hancock, to my immediate right is Brian Morris, and to my left is Michael Phillips, and I am Wendy Shanks.

Board counsel is Renee Marx, and the Executive Secretary is Deana Lemke.

Ms. Marx, would like to call the first person who would like to give input to the Board.

MS. MARX: Sure. I can call John Maissan. He has prepared a written submission as well, I think that we can follow along with, but I would invite him up to give his submission.

PRESENTATION BY JOHN F. MAISSAN:

MR. MAISSAN: Thank you. I have prepared a submission, Madam Chair, and it is fairly lengthy, and I don't propose to just read it into the record. What I propose to do is just summarize my comments, and I have circulated, by electronic means, this submission in PDF format, so you and others can read it in detail at your leisure. But I will go over the highlights of my presentation.

First of all, the first comment I want to make is on the new capacity planning criteria. Yukon Energy has indicated they have adopted this new planning criteria, the loss of load expectation of two hours a year and the N-1 emergency criterion.

From my perspective, these both make good sense, and I would recommend that you endorse their decision on those criteria.

Secondly, and sort of related to that, is the twinning of the Aishihik power line to cover some of the risk of the N-1. I have to say, on a personal basis, the potential cost of 16 to 19 million, and probably higher now, given the increased cost estimate for the Carmacks-Stewart crossing line, seems like a lot of money for just insurance, as it were. And my feeling is that I would much rather see sound maintenance of that

line, and would also like to see that money, instead, put into improved diesel capacity, particularly in the Whitehorse area. To me, that is far more secure than just a line.

A lot of things I can think of that would affect the power line, that is there now, would also affect a second line. If we think of things like -- well, things that can happen in summer are forest fire, lightning, earthquake-induced landslides and so on. They are only likely to happen in summer when it is not an issue. But, you know, big issues can happen to both lines, not just one. And as we found out last January, there are a number of other components of the power delivery system, from the powerhouse to the Whitehorse grid, that can also fail and cause outages.

So I guess I have to say that I am pleased that Yukon Energy is not proposing to build this second line, and I would recommend that you endorse that decision, and instead encourage them to supply that back-up diesel in Whitehorse.

The Mirrlees Life Extension Project I do believe is good. I believe it makes sense. I believe we need that capacity here in Whitehorse for N-1, and for our security of supply. So I would certainly recommend that you approve that

project.

In regards to the Carmacks-Stewart Crossing Transmission Project, Yukon Energy has asked that you allow them to proceed with the staged planning for and construction of this line under the appropriate circumstances, and first stage being to Pelly Crossing, and then from Pelly Crossing on to Stewart Crossing. I very much agree with Yukon Energy, that opportunities like these, with the two mines coming on very near to each other along the route, do not happen all of the time. And when, in the past, we, as Yukoners, and NCPC, have taken advantage of these opportunities, we have inherited infrastructure which has really provided significant long-term benefits. And I believe that a 138 kV line would provide similar benefits, a line in that corridor. So I would certainly recommend that you endorse their project for the 138 kV line. But I would not be happy with the 34 and a half kV line. I think that would be too short-sighted.

I would make a second recommendation in this regard, and that is that you recommend to the government, to whom your report will go, that they also participate in this line, because their participation, I believe, is necessary to make this

line economic for ratepayers.

The next project I would comment on is the Aishihik Third Turbine. This is a 7 megawatt turbine at a cost of about 7.2 million. This is almost certainly lower than the cost of new generators in a new building of their own. We understand from the submission that new diesel generators, placed in the existing building, would run about 930,000 per megawatt, and this is just over a million dollars per megawatt. So I think it is very cost-effective. It also adds new energy, which I do believe has a significant benefit to the system as well. I understand and can appreciate that it doesn't really meet the N-1 planning criteria in terms of providing back-up. However, I think that, in its design and construction, the third turbine can decrease the risk of loss of the entire power plant if it is designed in such a way that some of the electrical facilities between the powerhouse and the substation, on the surface, are twinned rather than all funnelling through the same equipment and cables to the substation at the top.

So my recommendation to you would be that you approve the Third Turbine Project, subject to the electrical design incorporating features such as the parallel electricity delivery from the

powerhouse to the substation, at the surface, to minimize the risk of future failures such as we experienced in January.

Other existing hydro enhancements: Yukon Energy has mentioned in its Resource Plan, in Appendix B, various other opportunities to enhance capacity or energy supply through upgrading at various existing facilities. Examples include new runners or wheels at Aishihik and at Whitehorse. These measures are almost always done at opportune times, such as at times when major maintenance is required, and, for instance, May Hydro plant was upgraded substantially prior to Mayo-Dawson line coming into service, and I think it makes very good sense to do these kind of projects when the opportunities arise.

So my recommendation would be that you encourage Yukon Energy to take advantage of any of these opportunities to enhance the output of their facilities.

Demand side management: The role that DSM plays in the Resource Plan is small, and I believe, contrary to the assertion in the Resource Plan on page 4-38, that DSM cannot reduce capacity requirements; I believe it can. I think there are a number of cost-effective DSM measures that could

be instituted effective immediately. I will give two examples.

First is the Mirrlees life extension work is going to cost about $457,000 per megawatt, or about 457 per kilowatt. Now, a typical 40-gallon water heater has two one-and-a-half kilowatt heating elements, and one of these is typically on when it is working. During peak times of the day, I understand from historical information, that about one third of the water heaters in any community would be turned on. So turning off any given number of water heaters would result in an average saving of half a kilowatt per water heater. This means, then, on a basis equivalent to the Mirrlees extension work, $228.50 could be spent putting something in place that could trip the water heater off during an emergency, during an N-1 emergency. And I think given modern electronics and communications, I do not think this is far beyond the realms of possibility.

If we look at comparison to the new diesel project, well, that number almost doubles, to $465 per water heater, as a justifiable investment.

Second example: I was shown, with some pride, a new home in Copper Ridge this past weekend. I have to say that my jaw almost dropped to the

ground when I walked into the house and saw baseboard electric heaters. This home is going to add 5 to 10 kilowatts to our winter peak, and this is going to cost Yukon Energy and ratepayers the equivalent of between two and almost $5,000 in Mirrlees extension work, just to meet that winter peak. And if we talk about new diesel engines, that is equivalent to four to $9,000 in new diesel engine capacity needed to meet the requirements of that new home. And that is aside from the diesel energy, during peaking times, that is going to be needed to serve that electric heating load. Surely a DSM program could be put in place, for far less than this, to discourage that kind of installation. And these are two examples.

There are probably a number of other things that could be done, cost-effectively, compared to the new capacity that is being added. And that is not to say that what is being done doesn't make sense, because I think it does, and I do support the Mirrlees extension work, but still, this kind of DSM is cost-effective.

So I would recommend to you that you instruct Yukon Energy to identify and pursue cost-effective and appropriate DSM measures, for present ratepayers and future new ratepayers, by working

with partners as appropriate.

Further, I would say that, in DSM, Yukon Electrical has to be there at the plate as well, and so does the Yukon Government. This is not just a Yukon Energy issue. All three parties have to be there. And I would recommend that the Board, through the government if necessary, similarly instruct Yukon Electric to get there and get to work.

And my third recommendation on this matter to you is that you recommend to the government that its Department of Energy, Mines and Resources, through the Energy Solutions Centre, work with the utilities and contribute financially to appropriate DSM programs.

Secondary sales: Yukon Energy currently has a hydro surplus of over 80 gigawatt hours a year, so we heard. About 21 of this is currently being sold as secondary energy, so there remains in the order of 60 gigawatt hours a year of surplus hydro that presently is not being sold. Increasingly, though, as the secondary sales go up, and fixed loads go up, this energy will be available in the warmer months, and eventually only in summer, and with the Minto and Carmacks Copper mines on, if this happens, that reduces to a period of about two or

three years.

Now, during the first day of hearings, we heard that in the mid '90s, when the Faro mine was operating, we were on diesel on the margin all year round. Well, I think this is a bit of an oversimplification, to be honest.

During the mid '90s, as you may recall, there were significant consecutive years of drought. We set some new record low inflows to our hydro facilities. And I believe that, even during some of these years, and certainly in the normal inflow year, we would have had surplus hydro in the summertime, at night, at the very least.

So I think, even with additional mines on the system, there is going to be secondary energy for sale, surplus hydro for sale as secondary energy, through the warmer months and particularly at night. It is just a matter of ensuring that the systems that are in place, that serve the secondary energy, can be turned on and off as appropriate, so it is surplus hydro that is being sold and not diesel on the margin.

So I would recommend to you that you instruct Yukon Energy that, in the event that Minto or Carmacks Copper mines are served by a power grid, they should pursue the continued sale of surplus

hydro to the existing secondary sales customers on a seasonal or time of day basis, as it is available.

Secondly, I would suggest that you instruct Yukon Energy that, in the event that Minto and Carmacks Copper mines are not served by the grid, that they more actively pursue the sale of the remainder of the surplus hydro.

Rate Stabilization Fund: The Yukon Government funds a rate stabilization fund that dates back to the closure of the Faro mine. Since the closure of the Faro mine, there have been some very active DSM programs delivered through the Energy Solution Centre. One of the focuses of these programs was to reduce the winter peak load and reduce the impact of increased rates on the hardest hit customers, those with electric heat. Because of the political popularity of this program, it has been continued by successive governments.

I believe that this program has achieved its original purpose, especially considering that the residential customer class already pays less than its full cost of service. I believe that this program is now counterproductive, and I believe that it is encouraging people, such as the client whose house I saw in Copper Ridge this past week,

to make choices like installing baseboard electric heat in new homes, because that is going to cost us all dearly in the longer run.

So I think it is time, now, to ensure that appropriate choices are being made by all people, businesses, and home owners, and I believe it is time that the Yukon Government got out of the subsidy program, the Rate Stabilization Fund.

So my recommendation to you is that, in your report to the Yukon Government, you very strongly recommend the termination of this rate subsidy program and that a portion of these funds be used to fund appropriate DSM programs, that I mentioned earlier, through the Energy Solutions Centre.

Net metering: The Resource Plan makes no mention of net metering opportunities, yet we know that there is certainly a percentage of our environmentally conscious public that would like to add some solar PV or other renewable energy resources to their homes. Across North America and Europe, equipment and safety standards have been developed to allow this to happen in an appropriate and safe manner. A number of Canadian provinces and U.S. states now have laws that require utilities to have a net metering policy in place, and accept net metering as part of their

practices. While it would be difficult to determine if there is any capacity or energy benefit to the system in the short term here in the Yukon other than on diesel systems where the benefits may be immediate. I believe there are likely to be some long-term benefits, among them the appreciation, I guess, of the high value of our hydro systems. Because I believe the people who would put these systems in would find that such renewable resources are quite expensive, compared to our grid hydro, and I think, in a sense, it is some public education, if nothing else. And there are people who are prepared to pay more to have and use green energy.

At one time in the past, Yukon Energy was working with Yukon Electric to try and establish a policy for net metering. And, unfortunately, they were not able to come to agreement. However, that was a number of years ago, and since then there have been a number of technical advances, particularly with respect to electrical safety, and I believe it is time for both the government and the utilities to put some appropriate policies in place.

So my recommendation is that you urge the Government, Yukon Energy and YECL to implement net

metering policies, as appropriate, to the Yukon.

Wind energy: I guess everyone who knows me will know that this subject is a matter near and dear to my heart, but I also believe that I am a fairly pragmatic person in respect of what makes sense and what doesn't. It is my view that wind energy can play a more prominent role in the Resource Plan than it currently has.

It is certainly true that wind energy does not have a firm dispatchable capacity. It is also true that we have some significant challenges with respect to cold temperatures and, most particularly, icing. Wind turbine icing mitigation, although getting an increased amount of attention across North America and Europe, still has not been resolved in a consistent way on a commercial basis. However, despite these limitations, I do believe that there are opportunities for cost-effective wind generation in Yukon.

Page 5-11 of the Resource Plan refers to the load fit of different energy supply options being considered, and refers to the energy rather than capacity in particular. I did not see in that discussion, anywhere, the fact that runoff hydro peaks seven months before the electrical load

peak. And Whitehorse is the exception, it is a glacier runoff, and its peak is in August, five months before the peak electrical load in January.

I also did not see anything about the profile of wind energy. Wind energy is most available in the wintertime when our electrical loads are highest, and is least available in the summer when our electrical loads are lowest. As far as I know, it is the only energy resource available that matches our electrical load pattern.

The Resource Plan, on page 5-21, describes scenario 1, which is a 10 megawatt mining load, roughly equivalent to Minto and Carmacks Copper on the system, and the need for an average 2 gigawatt hours a year of energy for this scenario. Now that Marsh Lake top storage is off the table, for the time being at least, there is an additional 7.7 gigawatt hours a year, for a total of 9.7 gigawatt hours per year, of diesel energy that would have to be supplied over the 20-year average period. A 5 megawatt wind plant operating at 25 percent capacity factor would fill this void. And certainly all information in my possession indicates that this energy could be supplied at costs substantially lower than diesel energy, even under Yukon conditions.

Furthermore, there have been opportunities for the sale of green energy at premium rates, for example the federal government has committed to purchasing 20 percent of its energy from green sources. And so far Yukon Energy has not or has not been able to take advantage of this, despite some interest from local federal departments. So there is the potential for additional revenue from green resources such as wind.

There has also been a wind power production incentive program in place, nationally, that provides a cent per kilowatt hour production subsidy, and right now the Canadian Wind Energy Association is actively pursuing, with federal officials, a program which, if implemented, could provide a production subsidy of some 3 cents per kilowatt hour to wind energy produced in the north. So there are some factors and some potential to reduce the cost of wind energy from where the perception might be that it is now.

And I would recommend that the Board instruct Yukon Energy to look more seriously at the benefits that wind generation can provide to the system, in scenarios involving mining loads being added to the system, and to consider the timing of wind energy availability as well as the opportunities for

additional revenue and cost recoveries in its economic evaluations.

The last subject I want to comment on is independent power producers.

Section 5.3.1.4 of the Resource Plan, principally pages 5-36 and 5-37, reads like these are all reasons why Yukon Energy would prefer not to have an independent power producer as a supplier. And a lot of these were concerns raised in the 1992 Resource Plan hearing. Many of those concerns are valid. However, I believe they are manageable concerns, and I think IPPs can provide cost-effective power supplies for ratepayers in the appropriate circumstances. B.C. Hydro has made extensive use of IPPs for a number of years. They are also now much more common in Ontario. I think it is a matter of negotiating the appropriate contracts and in the appropriate circumstances.

Some of the risks that are mentioned I think exist whether it is an IPP or Yukon Energy that builds a project, because if Yukon Energy builds a project and it becomes redundant, the costs will need to be paid for. No different than an IPP.

I think there are some other good reasons to consider IPPs. First of all, financial risk of construction cost overruns or major failures stay

with the IPP. They do not transfer to the utility. Once locked into a contract, if a developer finds he has a cost overrun, he has to eat that. And so it is not a risk to the ratepayers. The ratepayers are then protected from that risk.

The other issue is at times of major failure or downtime. When an IPP project has downtime because of a failure or scheduled maintenance, whatever, they are not getting paid. No energy, no money. And therefore they have a very high incentive to minimize the risk of failures, of shutdowns, and to maximize their availability.

A couple of examples of success stories would include the New Era Hydro's Fraser Micro Hydro project. I know that, in its first ten years, it has achieved well over 99 percent availability. There are not many hydro plants that can boast that. I do not know what has happened in the last several years, so I don't know if that has continued.

I can also tell you that virtually all wind power projects in Canada are IPPs. And there is a good reason for that. The operators are people who are involved in the wind business. They know it intimately, and they know the technology

intimately, and they are focused on it. If a wind turbine goes down, they can focus on it and get it repaired. They do not have a lot of other facilities of different types to worry about, and in terms of setting priorities for repairs.

So my recommendation would be that the Board instructs Yukon Energy to develop, within the next year, a policy that sets out the circumstances, including supply technologies and project size, in which IPPs would be solicited, and the principles with respect to power pricing and other matters, as necessary, of any contract that would apply, and to consider IPPs seriously for supply projects of the appropriate technology and scale in load scenarios that require new capacity or energy supplies other than enhancements to the existing facilities.

Thank you, Madam Chair. That concludes my submissions.

THE CHAIR: Thank you very much. It is obvious you put a lot of time and thought into a very thorough presentation. Thank you very much.

MR. MAISSAN: You are welcome.

THE CHAIR: Ms. Marx, are there any other individuals that would like to make a presentation?

MS. MARX: Madam Chair, I am not aware of any other individuals, but if there are any, perhaps they can just come up to the microphone and make their presentation and introduce themselves.

THE CHAIR: Well, on that basis, we will adjourn until tomorrow morning, 9:00.

(Proceedings adjourned at 6:45 p.m.)

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