REFERENCE: **Page 2-9 line 18 onwards, regarding Load Forecasts and Demand Supply Management (DSM). Line 30 states "There is currently a hydro energy surplus in Yukon."**

QUESTION: **DEMAND SUPPLY MANAGEMENT**

When are the diesels on the WAF grid currently used?

ANSWER:

The diesel units on WAF are currently used for one of two purposes:

- **Peaking:** When the system peak approaches 54 MW (i.e., on very cold winter days), YEC will be unable to meet any further peaking loads with increases in hydro output. At these times, YEC will interrupt secondary sales and then, if required, turn on diesel units to meet peak loads. In general, this occurs relatively few hours per year (expected to be less than 100 hours in 2007 under Resource Plan base case load assumptions).
- **Backup for Unit Failures:** In the event the hydro system is not able to supply 100% of the load due to unplanned failures of hydro units or transmission, the diesel units will be used to meet loads. An example is the January 29, 2006 loss of the Aishihik transmission line. For units located on radial transmission lines (like Faro or Teslin), the units can similarly be used for local support when the transmission connections are unavailable.

REFERENCE: **Page 2-9 line 18 onwards, regarding Load Forecasts and Demand Supply Management (DSM). Line 30 states "There is currently a hydro energy surplus in Yukon."**

QUESTION: **DEMAND SUPPLY MANAGEMENT**

If used for peaking, why isn't DSM implemented to bring peaking down or eliminated?

ANSWER:

YEC does operate a major DSM program to manage the system demand and make use of the surplus hydro while keeping the peak loads down. The program (Secondary Energy) offers customers the opportunity to buy surplus hydro on an interruptible basis for heating purposes at prices linked to heating oil costs, and interrupts these customers at peak times so they do not have to be supplied from diesel generation.

There are three reasons why further DSM in the form of reduced firm consumption is not being pursued today with respect to firm peak loads:

- **Short Peaking Requirements:** Units used for peaking are only operated a relatively short period of the year (in 2007 forecast at about 94 hours if normal weather occurs, less if warmer than usual). Outside of these very few hours, YEC still has surplus hydro on the system.

Not Practical to Achieve: The WAF system must start using diesel when loads reach into the range of 54 MW or higher (this is where the hydro units have been basically maximized within normal operating constraints). Although this occurs very infrequently, the hours where it does occur, total WAF loads can exceed this level by a fairly substantial margin (the total WAF load on January 13, 2005 was estimated at 56.4 MW including loads served by Fish Lake, when temperatures were about -41 Celsius). In order to reduce this peak by 2-3 MW would require DSM activities to achieve about a 5% reduction in peak loads, which is extremely difficult and impractical for a system with no major industrial customers[1].

1 Major industrial customers offer the ability for a group of DSM activities related to “curtailable” firm load, whereby the customer can be interrupted to a substantial degree when the utility requires, within certain constraints. This type of offering is generally not practical nor of interest to smaller commercial customers or residences, as the loads to be interrupted are too small, are typically not readily remote controlled (even relatively large secondary sales loads, well in excess of a typical residence, cannot be practically remote controlled) and service loads that cannot accept interruptibility (such as commercial refrigerators). As a result, there is no expected practical application of curtailable load programs on WAF at the present time.

- **Very costly in practical terms:** DSM activities aimed at reducing peaking consumption over very few hours are generally very difficult. A good example of this difficulty from the 1992 Resource Plan hearing is the Block Heater Power Saver Cord program being operated at the time. Block Heaters are one load that contributes to peak demand. However, although the program targeted at block heaters was estimated at that time to reduce peak loads by 0.2 MW, it was estimated to reduce overall energy consumption by 0.69 GW.h[2]. Were such a program to be in place in 2007, the cost savings for reduced diesel fuel usage would approximate $3600[3]; however at an average energy rate for residential consumption of 12.6 cents[4], the lost revenue from a similar program being in place today would equal approximately $87,000. In other words, since most loads most of the year are now supplied with basically no-cost surplus hydro, any load reductions outside of peak times are very "costly" to the consolidated revenue requirement of the utilities. Although this type of program, if it operated for long periods of time, could allow YEC to defer capital investment in new capacity, the net cost of the program of $83,400 a year plus program costs (whatever is needed to get uptake of the Power Saver Block Heater Cords) far outweighs the capital costs of installing the 200 kW of added capacity (even at the price of new diesel units of $930k/MW, this approximates $186,000). It is not likely reasonable to add in excess of $83,400 in added costs per year on ratepayers in order to avoid a one-time $186,000 capital investment.

2 Per Binder B page 36-37 of the YEC and YECL 1992 Resource Plan.

3 Diesel is expected to be operated for 94 hours in 2007 based on normal winter weather, at 200 kW this equals 18,800 kW.h, or $3600 at approximately 20 cents/kW.h for diesel fuel.

4 The Hydro Residential Non-Government energy rate is 9.86 cents/kW.h plus 14.93% for Rider J and 1.2799 cents for Rider F at current rate.

REFERENCE: Page 2-9 line 18 onwards, regarding Load Forecasts and Demand Supply Management (DSM). Line 30 states "There is currently a hydro energy surplus in Yukon."

QUESTION: DEMAND SUPPLY MANAGEMENT

Has YEC done a study on peak demand? Can YEC provide the details of studies they have done about peak demand on the WAF grid, this should include daily, monthly and yearly variances? Also provide a breakdown of industrial, commercial, and residential use.

ANSWER:

Note that preamble indicates “hydro energy surplus” referring to average annual kW.h of available hydro. The question however is referring to “peak demand” which is peak load consideration. YEC does not have a demand or capacity surplus.

YEC has not specifically done any studies on peak demand per se. With respect to YEC’s approach to forecasting peak demand, see UCG-YEC-2-54. YEC also has developed models to aid in assessing the quantity of peaking diesel generation required in a year given a specified peak load, standardized load duration curve, and a given complement of installed hydro capacity. This assessment is used, for example, to generate the diesel generation figures used in Appendix C to assess the economics of the Aishihik 3rd Turbine.

YCS-YEC-2-A3 Attachment 1 is an excel copy of the WAF grid hourly peak demands for 2004. This material was reflected in the peak demand assessment used in the Resource Plan, as well as the 2005 January peak load of 56.4 MW. A breakdown by customer class is not available as YEC does not have access to this information from YECL (see UCG-YEC-2-45).

REFERENCE: **Page 2-9 line 18 onwards, regarding Load Forecasts and Demand Supply Management (DSM). Line 30 states "There is currently a hydro energy surplus in Yukon."**

QUESTION: **DEMAND SUPPLY MANAGEMENT**

Please provide the YEC DSM policy.

ANSWER:

YEC does not have a DSM policy. Please see YCS-YEC-2-A2.

REFERENCE: **Page 2-9 line 18 onwards, regarding Load Forecasts and Demand Supply Management (DSM). Line 30 states "There is currently a hydro energy surplus in Yukon."**

QUESTION: **DEMAND SUPPLY MANAGEMENT**

Has YEC looked at other jurisdictions regarding DSM? Please provide any of YEC's findings.

ANSWER:

Yes, YEC has looked at other jurisdictions regarding DSM. This includes general review of many DSM programs throughout Canada, as well as specific review of Manitoba Hydro's "DSM Market Potential Study 2003" and "Demand Side Management Incentive in Canada Case Studies of Aquila Networks (FortisBC) and Enbridge Gas Distribution" which was prepared for the Office of Energy Efficiency Natural Resources Canada.

YEC's findings with respect to DSM are set out at Appendix A section A.1.12. and YCS-YEC-2-A2.

REFERENCE: **Page 2-9 line 18 onwards, regarding Load Forecasts and Demand Supply Management (DSM). Line 30 states "There is currently a hydro energy surplus in Yukon."**

QUESTION: **DEMAND SUPPLY MANAGEMENT**

Has YEC considered industrial (as opposed to residential) DSM?

ANSWER:

No. YEC currently has no industrial customers.

REFERENCE: **Page 2-9 line 18 onwards, regarding Load Forecasts and Demand Supply Management (DSM). Line 30 states "There is currently a hydro energy surplus in Yukon."**

QUESTION: **DEMAND SUPPLY MANAGEMENT**

Has YEC considered seasonally adjusted rates to coincide with surplus hydro seasons?

ANSWER:

No. YEC has not considered seasonally adjusted rates to coincide with surplus hydro seasons as basically all hours on the WAF and MD systems have surplus hydro, with the exception of a very few peak hours (as noted in YCS-YEC-2-A2).

YEC does have a rate offering (secondary energy) that sells surplus hydro for dual-fuel heating purposes at rates tied to heating oil prices that it will interrupt at peak times (when diesel generation is required).

REFERENCE: Page 2-11, line 11 and 12

QUESTION: CUSTOMER USE PATTERNS

Does YEC and Yukon Electrical Company Limited (YECL) share information openly about customer use patterns? YCS would like YEC to obtain an analysis on customer numbers or use per customer on YECL's current retail, industrial and government buildings.

ANSWER:

No. Yukon Energy did make its general customer use data available during its 2005 YUB revenue requirements proceeding. However, Yukon Energy has very few customers (about 1700 customers or 11% of customers in Yukon).

Yukon Electrical does not provide any data on customers or customer use patterns to YEC. For more information please see UCG-YEC-2-45.

REFERENCE: Page 2-11, line 11 and 12

QUESTION: CUSTOMER USE PATTERNS

Can YECL provide an analysis on customer numbers or use per customer on YECL's current retail, industrial and government buildings.

ANSWER:

Yukon Energy has attempted to secure this data, but YECL refused to provide it for consideration in Yukon Energy's planning process. See UCG-YEC-2-45.

REFERENCE: Page 2-12, line 8 onwards, regarding Independent Power Producers (IPP)

QUESTION: INDEPENDENT POWER PRODUCERS

Please provide YEC's IPP policy for the Yukon.

ANSWER:

Yukon Energy does not have an IPP policy for the Yukon. IPPs as a supply option are discussed in section 5.3.1.4 of the Resource Plan at page 5-36 to 5-38.

REFERENCE: Page 2-12, line 8 onwards, regarding Independent Power Producers (IPP)

QUESTION: INDEPENDENT POWER PRODUCERS

Does YEC have a policy on the price it will pay for power generated by independent producers? What are the price calculations based on?

ANSWER:

No. YEC does not have any standard price it will pay for power generated by independent power producers. Given hydro surpluses on each of YEC's major systems, YEC has no practical opportunities to purchase IPP power.

In the event diesel generation was on the margin for 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.

REFERENCE: Page 2-12, line 8 onwards, regarding Independent Power Producers (IPP)

QUESTION: INDEPENDENT POWER PRODUCERS

Are there price incentives to encourage the development of small, community or regionally based independent power projects?

ANSWER:

See section 5.3.1.4

REFERENCE: Page 2-12, line 8 onwards, regarding Independent Power Producers (IPP)

QUESTION: INDEPENDENT POWER PRODUCERS

Has YEC developed a firm policy for Yukon First Nation Governments who may want to develop their own community based power projects that would include accessibility to both existing and proposed power transmission lines?

ANSWER:

See YCS-YEC-2-C1.

REFERENCE: Page 4-21, line 21 onwards

QUESTION: MARSH LAKE WETLANDS and SHORELINES

"Environmental licensing activities" could be a project 'stopper'. Has YEC done any wetland studies, shoreline erosion studies or shallow water (littoral) habitat studies in regards to the existing license? YCS requests these studies be filed as exhibits.

ANSWER:

No studies have been conducted to date except for the preliminary work done by YEC's consultants during September of 2006. This information will be filed with the YUB as part of an update once the consultants' field report is available.

REFERENCE: Page 4-21, line 21 onwards

QUESTION: MARSH LAKE WETLANDS and SHORELINES

Has YEC initiated any studies on future wetland, shoreline or shallow water (littoral) habitat changes that the 20 Year Plan could instigate?

ANSWER:

See YCS-YEC-2-D1.

REFERENCE: Page 4-21, line 21 onwards

QUESTION: MARSH LAKE WETLANDS and SHORELINES

Has YEC sanctioned any fisheries studies, wildlife studies or assessed the health of riparian habitat that is within the zone of influence by the existing license?

ANSWER:

See YCS-YEC-2-D1.

REFERENCE: Page 4-21, line 21 onwards

QUESTION: MARSH LAKE WETLANDS and SHORELINES

Will the Marsh Lake license amendment go through a Yukon Environment and Socio-Economic Assessment Act (YESAA) hearing?

ANSWER:

The Marsh Lake project will be subject to a review under YESAA. It is not yet determined what form of review would occur.

REFERENCE: Page 4-21, line 21 onwards

QUESTION: MARSH LAKE WETLANDS and SHORELINES

Will YEC release wind data regarding Marsh Lake? YCS requests that all Marsh Lake wind data be filed as exhibits.

ANSWER:

See YCS-YEC-2-D1.

REFERENCE: GREENHOUSE GAS EMISSIONS

QUESTION:

What is the status of the Yukon Green Power Initiative? How have its recommendations been incorporated into the 20 year plan?

ANSWER:

See YCS-YEC-2-E2 in respect of the program. There are no known or expected projects on the WAF or MD systems arising as a result of the Green Power initiative.

REFERENCE: GREENHOUSE GAS EMISSIONS

QUESTION:

What is the status and future plans for the following programs outlined in the document An Inventory of Yukon Climate Change Initiatives, Yukon Climate Change Coordinating Committee, February 3, 2001

Renewable Energy Resource Assessment

The Yukon Development Corporation works to identify Yukon's renewable energy resource potential on a comprehensive and systematic basis to assess the value for future supply. This involves assessments, database development, mapping renewable hydro potential for wind, geo-thermal and biomass resources, as well as pilot projects such as the commissioning of a portable solar/hybrid prototype and investigating hydro feasibility. The Renewable Energy Resource Assessment also monitors and participates in initiatives that impact on land use such as the Protected Areas Strategy and regional land use planning.

Renewable Power Sales Incentive Program

The Renewable Power Sales Incentive Program is a joint initiative of the Yukon Development Corporation and Yukon Energy Corporation. It encourages the consumption of available surplus hydro electricity to displace fossil fuels used for space and water heating for general service, government and industrial customers. The program guarantees a return on investment to customers who install the equipment necessary to purchase secondary power. It also provides technical services such as feasibility planning and building design, financial assistance like interest abatement, loans and capital contributions, electronic power dispatch and a building energy management reporting service.

Green Power Initiative

The Yukon government's Green Power Initiative encourages renewable energy production in an environmentally sustainable manner. Its objectives are to displace diesel electricity production and reduce greenhouse and other gas emissions, especially in communities only served by diesel generation; to provide consumers with a green power option; to expand the technical capability to develop green power alternatives; and to improve the long-term cost effectiveness of green power energy sources. The

program will achieve these goals through research and development, demonstration projects, targeted technical information, development of standards and youth education projects.

ANSWER:

The only one of these programs that Yukon Energy was involved with was the Renewable Power Sales Incentive Program, which expired on December 31, 2004. Yukon Energy is not involved in the other two programs.

REFERENCE: GREENHOUSE GAS EMISSIONS

QUESTION:

How is YEC currently accounting for greenhouse gas emissions? Has YEC sold any greenhouse gas credits as a result of the Mayo-Dawson Project? If so, how much? Has YEC investigated the potential for greenhouse gas credits for the proposed Carmacks-Stewart line?

ANSWER:

Yukon Energy currently tracks its annual GHG emissions and emissions intensity and has not sold any GHG emission credits arising from the Mayo-Dawson transmission line project. YEC has not investigated the potential for GHG credits for the Carmacks-Stewart project due to the lack of policy and direction for the Federal Government on a climate change action plan and emission reduction requirements for electrical utilities (YEC may be deemed to be a large final emitter) and for provinces and territories. It would be imprudent to sell credits without the knowledge of whether the government will require YEC to meet yet-to-be-established emission reductions.

REFERENCE: GREENHOUSE GAS EMISSIONS

QUESTION:

The Kyoto Protocol deadlines fall within the timeline of the 20 year plan. How is YEC reducing greenhouse gas emissions over the timeline of the 20 year plan?

ANSWER:

Without knowing the requirements that YEC will be required to meet, it is not possible to incorporate Kyoto Protocol targets specifically into the Resource Plan. However, in both the near-term projects proposed and the longer-term industrial development scenarios, the focus of the Resource Plan is on projects that maximize the capability of existing resources such as hydro. As such, all actions proposed in the Resource Plan are either neutral to greenhouse gas emissions or substantially positive (by, for example, avoiding peaking diesel use at Whitehorse, or avoiding diesel generation at Yukon mine sites through provision of grid hydro power).

Also see YUB-YEC-2-22(d) with respect to the Carmacks-Stewart project.

REFERENCE: GREENHOUSE GAS EMISSIONS

QUESTION:

Does YEC have a greenhouse gas reduction policy as part of its 20 year plan?

ANSWER:

No.

REFERENCE: GREENHOUSE GAS EMISSIONS

QUESTION:

Will the refurbished Mirrlees be more efficient and thus reduce greenhouse gas emissions? Please provide information on payback scenarios, fuel usage/energy efficiency and greenhouse gas emissions for new, state of the art energy efficient generators versus the rebuilt Mirrlees generators.

ANSWER:

In general, no. The intended use of these units is for emergency backup power, with very few hours of actual operation. As a result, they are expected to have a negligible effect on diesel fuel use or GHG emissions due to the low numbers of hours they are expected be run. The Mirrlees units, however, as low speed baseload units, which are typically more efficient than high-speed units.

REFERENCE: FOSSIL FUEL PRICE SCENARIO'S

QUESTION:

Has YEC drawn up scenarios for when diesel (such as is used for home heating oil) prices increase and consumers start switching over to electrical heat? Is there information on an energy scenario that takes into account an increase in the cost of diesel, thus leading to a reduction of its use, but a related increase in electrical power use?

ANSWER:

No. Yukon Energy has not done scenarios for home heating switching to electric. This is a potential load development that Yukon Energy believes must be taken seriously in the event that firm electricity "run-out" rates (e.g., for monthly consumption above about 1000-1500 kW.h per month, net of all subsidies) are well below the effective cost of home heating using oil or propane. However, at the present time, the Electrical Service Regulations do not allow the utilities to prevent customers on the integrated WAF and MD systems from using electric heat.

In the near-term scenarios, such a development would likely give rise to the higher load growth scenarios, rather than the base case. Such a development would not change the benefits or necessity of the near-term projects proposed, but in the period following 2012 would likely advance the need for serious consideration of DSM and energy supply options, such as small new hydro or other facility enhancements not yet fully assessed (such as diversion projects or re-runnering).