

EXHIBIT A-19**INFORMATION REQUESTS TO YEC
FROM YUB BOARD STAFF**

DAY	ENTERED BY	DATE
	YUB	Sept 6/06

YUB-YEC-2-1

Billinton/Karki conducted a probabilistic assessment of the generation and transmission adequacy of the WAF system using the Loss of Load Expectation (LOLE) and the Loss of Energy Expectation (LOEE) reliability criteria. Did Billinton or Karki ever suggest to YEC to adopt a deterministic criterion?

YUB-YEC-2-2

The February 2005 Billinton/Karki Report found that a 1.15 days/year LOLE or a 3.903 MWh/year LOEE resulted in the same load carrying capacity as the WAF deterministic 1996/97 criteria. The Resource Plan indicates (pages 3-20) that typical LOLE values commonly used by other Canadian utilities range from 1 to 2 days/year.

- Please explain YEC's rationale for adopting the 2 days/year LOLE instead of 1 day/year, which is much closer to the 1.15 days/year found by Billinton/Karki
- If the WAF deterministic 1996/97 criteria is not providing adequate generating capacity, why not adopt a more stringent 1 day/year LOLE instead of the less stringent 2 days/year LOLE?
- Why did YEC decide not to adopt a LOEE-based criterion?

YUB-YEC-2-3

The February 2005 Billinton/Karki Report indicates that industry-typical Forced Outage Rates (FOR), namely 3% for hydro and 10% for diesel plants, were used in the LOLE calculation. The Conclusions (Section 7) of the February 2005 Billinton/Karki Report states that it is important to obtain actual system and equipment specific data for realistic reliability evaluation and strongly recommends that a routine data collection scheme be established to record system events involving generation and transmission equipment forced outages and the relevant failure and repair data be extracted and compiled on an annual basis. In this regard:

- Is the lack of system-event **historical** generation data for YEC's and YECL's generating units the reason **why** YEC used industry-typical FORs rather than FORs derived from actual records?
- Has YEC implemented this recommendation?
- If yes, do the FORs computed **using** data collected to date show significant discrepancies from **the industry-typical** FORs used?

YUB-YEC-2-4

In response to YUB-YEC-1-3(b), YEC indicates that the load data used in the LOLE calculations was hourly load data (as shown on page 13 of the Billinton/Karki main report) and that the model used all the hourly values in a seasonal or annual period. YEC also included chronological loads from February 2, 1999, to January 31, 2004, in YUB-YEC-1-3 Attachment 3B. In this respect:

- Please confirm that the LOLE calculations were conducted over a two-season period, namely a summer season (April to October) and a winter season (November to March), as stated on page 3 of the June 2005 Billinton/Karki Report.
- If yes, were the Load Durations Curves (LDC) shown on Figure 2.4 of the February 2005 Billinton/Karki Report the ones used in the model?
- The chronological load data provided in YUB-YEC-1-3 Attachment 3B does not include February 2004 to March 2004, so we are unable to produce the 2003-2004 November to March winter season LDC. Please provide this load data.
- Page 13 of the February 2005 Billinton/Karki Report indicates that the annual load factor was 56.8%. However, the June 2005 Billinton/Karki Report indicates (on page 4) an annual load factor of 64.59%. Please explain why different load shapes were used in these reports.
- Please clarify which load shape (the 56.8% or the 64.59% load factor) was used in the calculations of Load Carrying Capacity (LCC) at 2 days/year LOLE that appear on Table 3.5 (page 3-24) of YEC's Resource Plan?

YUB-YEC-2-5

Please explain why the most recent June 2005 Billinton/Karki Report uses maximum continuous ratings (MCR) of 4 MW for unit WD1 and 5 MW for units WD2 and WD3, while the less recent February 2005 Billinton/Karki Report uses MCRs of 3 MW for Unit WD1 and 4.2 MW for units WD2 and WD3.

YUB-YEC-2-6

Page 2-17 of the Resource Plan states: "Since the Faro Mine closure in 1998, a 5 MW diesel unit was retired at Faro. Two diesel units with a combined capacity of 2 MW were moved to Mayo, and a 1.3 MW unit was removed from Faro to act as a mobile unit. The result is a decrease in the Faro diesel plant size from 13.6 MW to 5.3 MW; in addition, two diesel units with a combined capacity of 1.3 MW were retired from Mayo".

- Please explain why the most recent June 2005 Billinton/Karki Report includes 7 units at Faro.
- Has the 1.3 MW unit, which was removed from Faro to act as a mobile unit, been accounted for in the Resource Plan? If no, please explain why. Can this mobile unit be installed back on the WAF grid to help alleviate the capacity shortfall?

- Given that the MD grid does have surplus capacity for the foreseeable future, has YEC considered returning one or both diesel units that were moved from Faro to Mayo, back to Faro?

YUB-YEC-2-7

YEC indicates (YUB-YEC-1-2) that it is aware of only one other utility that uses a two-part criterion as YEC, namely the Northwest Territories Power Corporation (NTPC), and (page 3-21 of the Resource Plan) that YEC's proposed two-part capacity planning criterion is essentially the same as the capacity criteria approved by the regulator for the Yellowknife system. In this respect:

- Has the Yellowknife system also adopted a LOLE criterion?
- If yes, is it also 2 days/year or different?
- If yes, is it calculated in the same manner as YEC's proposed LOLE? Specifically, is it also calculated over an 8760-hour period, does it account for seasonal capacity derates, no planned maintenance, and does it account for transmission outages similar to YEC's Aishihik/L171 multi-state model?

YUB-YEC-2-8

Page 3-9 of the Resource Plan states that in 80% of the years (i.e., non-drought years), the Whitehorse Rapids Hydro Plant could reliably provide 24 MW or more during winter.

- Please state how much capacity can reliably be counted on during non-drought years and include historical records to support your answer.
- During an N-1 condition, in a drought year, and at the time of the annual peak load, can the output of the Whitehorse Rapids Hydro Plant be increased above 24 MW even if it is for a short period of time? Please elaborate on your answer.

YUB-YEC-2-9

Page 3-9 of the Resource Plan states: "Recent rewinds performed on AH1 indicate a potential to increase the rating on the units to 15.4 MW. However, rewind work has not yet been performed on AH2 (scheduled for 2006) and until this is completed and consequent coordinated testing done on the units, YEC will not be able to confirm the slight increase in capacity ratings".

- Has the rewind work been completed at AH2?
- When can the increased capacity (30.8 MW) be counted on?

YUB-YEC-2-10

In Response YUB-YEC-1-10, YEC indicates it has conducted an analysis of the capacity projects to determine an optimal sequence, which is based primarily on the practical limitations of size and earliest potential in-service date for each project. This expansion sequence has been provided in the table entitled "WAF

System Capacity Shortfalls (MW) 2005-2012 under base case loads." With respect to this table:

- The Carmacks-Stewart line assists with 6 MW on 2009, 5.9 MW in 2010, 5.8 MW in 2011, and 5.6 MW in 2012. Please explain how these figures were arrived at.
- Was the annual capacity assistance computed as the difference between the firm winter capacity in the MD Grid minus the winter peak load connected to the MD Grid? If no, please explain.
- If yes, are the figures decreasing each year due to peak load increase in the MD Grid?
- Is YEC assuming that the annual peak in the WAF always coincides with the annual peak in the MD? Or, has any load diversity between the WAF and the MD grids been accounted for?
- The table shows the Carmacks-Stewart transmission line project on line in the year 2009. However, The Resource Plan states that this project will be pursued only if federal funding is provided and if mine loads develop. The table also shows the expansion sequence for the base case loads without mine loads. Therefore, it is unclear as to why the Carmacks-Stewart line has been included. Please clarify.
- What other alternative projects does YEC propose to be on line by 2009 and beyond, that would meet the planning criteria if the Carmacks-Stewart transmission line does not proceed? (It is not clear from the statements on page 3 of 6 of YUB-YEC-1-10b and the references to Section S1.3 what YEC is specifically proposing to construct at the Whitehorse Rapids Diesel Plant if the Carmacks-Stewart line does not proceed).
- It is unclear why the refurbished WD3 unit provides 5 MW in 2007 and 5.8 MW in 2008. Please explain.

YUB-YEC-2-11

The expansion sequence presented in Response YUB-YEC-1-10 shows only three projects during the 2006-2012 period, namely Marsh Lake Fall/Winter Storage, Carmacks-Stewart Line, and Mirrless Life Extension. However, the Aishihik third turbine project is not included as it is of limited firm capacity benefits, even though this project could potentially be put in service by the third quarter of 2008. In this regard:

- Please confirm that the limited firm capacity of the Aishihik third turbine project is in fact zero under the N-1 criterion.
- Has YEC considered twinning the portion of the transmission line from Aishihik to Whitehorse as an option? (It would be significantly shorter than the Carmacks-Stewart Line)
- Would twinning the Aishihik-Whitehorse portion provide 15 MW of firm capacity, as compared to only 6 MW for the Carmacks-Stewart Line, under the N-1 criterion? (A single turbine outage at Aishihik becomes the worst N-1 event)

- Would twinning the Aishihik-Whitehorse portion and the Marsh Lake Fall/Winter Storage projects provide adequate capacity until past 2010 under the N-1 criterion and until 2009 under the LOLE criterion?
- When would be the earliest that the twinning of the Aishihik-Whitehorse portion and the Aishihik third turbine projects could be on line?
- Would twinning the Aishihik-Whitehorse line and the Aishihik third turbine meet both the N-1 and LOLE criteria?

YUB-YEC-2-12

The Marsh Lake Fall/Winter Storage project is credited with 1.6 MW of additional capacity from the Whitehorse Rapids Plant during the winter peak.

- How would YEC include this project into the LOLE calculation?
- Would the 24 MW output capacity shown on the multi-state model (on page 11 of the February 2005 Billinton/Karki Report) be simply increased to 25.6? If no, please explain.

YUB-YEC-2-13

Has YEC computed the Load Carrying Capacity (LCC) at 2 days/year LOLE from 2005 to 2012 and for the projects included in Response YUB-YEC-1-10? If yes, please provide the computed LCCs.

YUB-YEC-2-14

The Carmacks-Stewart transmission line would join the MD and WAF grids into one larger grid, which means that generation and load data for the MD grid is required in order to compute the LCC (at 2 days/year LOLE) of the joined MD-WAF grids after this transmission line is commissioned. Therefore, please provide the following data:

- Chronological hourly loads for the MD Grid (similar to that provided in YUB-YEC-1-3 Attachment 3B).
- A list of all MD generating units complete with name, type, FOR, and seasonal limitations. (Unless the list in Table 2.1 of the Resource Plan is comprehensive, the FORs are 3% for hydro and 10% for diesel, and there are no energy or capacity limitations.)

YUB-YEC-2-15

Reference: Review of the Capital Resource Plans of Yukon Energy Corporation and Yukon Electrical Company Limited. Report to Commissioner in Executive Council by Yukon Utilities Board, December 7, 1992

Pages 82 to 83 discuss a study of ice conditions and field testing of a plan that included load factoring. The study could result in a formalized plan that may result in an adjustment to the firm capacity of the Whitehorse Rapids Plant.

- Did the aforementioned study result in a change in the rated capacity for Whitehorse Rapids? Is there any further opportunity for load factoring?
- Please provide a copy and the results of the study.

YUB-YEC-2-16

Reference: Review of the Capital Resource Plans of Yukon Energy Corporation and Yukon Electrical Company Limited. Report to Commissioner in Executive Council by Yukon Utilities Board, December 7, 1992 (Page 86, 7.3.1.2 Reserve Criteria)

The Board notes Mr. Druce's comment that the Yukon System is not an interconnected system and, thus, has the ability to develop its own reliability criteria specific to Yukon and the importance of using reliability criteria that result in a reliable system without excess capacity.

- How do YEC's proposed new planning criteria respond to these comments, in particular, that comment that the reliability criteria should result in a reliable system without excess capacity?

YUB-YEC-2-17

Reference: Review of the Capital Resource Plans of Yukon Energy Corporation and Yukon Electrical Company Limited. Report to Commissioner in Executive Council by Yukon Utilities Board, December 7, 1992 (Page 92, Recommendation #16)

- Please indicate the status of the decision support systems as described in Recommendation #16.

YUB-YEC-2-18

Reference: Review of the Capital Resource Plans of Yukon Energy Corporation and Yukon Electrical Company Limited. Report to Commissioner in Executive Council by Yukon Utilities Board, December 7, 1992 (Page 97, Recommendation #20)

- Have any further environmental costs been identified for the top storage at Marsh Lake?

YUB-YEC-2-19

Reference: Review of the Capital Resource Plans of Yukon Energy Corporation and Yukon Electrical Company Limited. Report to Commissioner in Executive Council by Yukon Utilities Board, December 7, 1992 (Page 103, Recommendation #22)

- Please report on the costs and success of the DSM programs as identified in the 1992 Capital Resource Plan. Please list the results of each DSM program undertaken. Does YEC propose any future DSM programs?

YUB-YEC-2-20

Reference: Review of the Capital Resource Plans of Yukon Energy Corporation and Yukon Electrical Company Limited. Report to Commissioner in Executive Council by Yukon Utilities Board, December 7, 1992 (Page 139, Recommendation #39)

- Please report on the long-term hydrological data bases requested in Recommendation #39 and how that information has been incorporated into YEC's 20-Year Resource Plan.

YUB-YEC-2-21

Reference: YEC 20-Year Resource Plan, 4.3.3 Carmacks-Stewart Transmission Project (Page 29)

"Development of this project, which is estimated to cost \$32 million (2005\$), is subject to provision of Yukon government funding to ensure that there is no net cost to Yukon Energy or Yukon ratepayers beyond what would be required for any other option to provide required capacity and energy. New mine connections to this project will also be required to be funded by customer contributions. Accordingly, if developed, the project will be funded by no-cost capital (e.g., Yukon government funding plus mine customer contributions) to a level that ensures no adverse rate impacts. New mine firm energy use could have beneficial near term rate impacts for Yukon ratepayers."

- What does YEC mean by "no net cost to Yukon energy or Yukon ratepayers beyond what would be required for any other option to provide required capacity and energy"?
- Which option is being compared to provide the required capacity and energy?
- Have any firm mine contracts been signed to support this option?
- Explain how contributions from mine customers would be calculated for this option.
- Provide an estimate of the expected contributions from customers to support this option.

- Quantify the beneficial near term rate impacts for Yukon ratepayers from new mine firm energy.
- Has the Yukon government confirmed funding for this project? Has the amount been determined?
- If government funding, or the level of government funding, is unclear and if new mine firm energy is also uncertain, how does YEC propose the Board evaluate this proposal?
- Have you completed a cost benefit analysis of this project? If so, provide all quantitative results.
- What is the current status of this project?

YUB-YEC-2-22

Reference: YEC 20-Year Resource Plan, 4.3.4 Mirrlees Life Extension Project (Page 30)

"Assuming development of the Aishihik third turbine and the Marsh Lake Fall/Winter Storage (plus the Carmacks-Stewart Transmission, if Yukon government funding is provided), Yukon Energy will face a WAF capacity shortfall primarily related to the N-1 capacity criterion and the weaknesses associated with the Aishihik transmission line."

- If the Board does not approve YEC's new capacity criterion as proposed, and if the Aishihik, Marsh Lake, and Carmacks-Stewart options proceed, is the Mirrlees Life Extension Project necessary?
- List the weaknesses associated with the Aishihik transmission line.
- Operationally, how has YEC overcome these weaknesses in the past?
- Should an alternative for the Aishihik transmission line be considered to overcome any perceived weaknesses? Should this option be given a higher priority than the Carmacks-Stewart transmission line? Why or why not? Would this option (Aishihik transmission line) have lower environmental costs?

YUB-YEC-2-23

Reference: YEC 20-Year Resource Plan 4.3.8 Schedule and Sequencing (Page 32)

"The Aishihik 3rd Turbine Project is the exception in that it has some flexibility regarding scheduling and in-service date (as it does not contribute in any material way to meeting WAF firm capacity shortfalls)."

On page 3 of YEC's 20-Year Resource Plan, YEC states "If no major new industrial loads emerge, these WAF and MD hydro energy surpluses could remain for most or all of the current 20-year planning period."

Yukon energy is facing a shortfall today, however, in WAF generation capacity to serve winter peak loads. This shortfall is due to pending retirement of some Whitehorse diesel units, load growth and the adoption of new capacity planning criteria.”

- Given that there is surplus energy and that the Aishihik Third Turbine Project does not contribute to WAF firm capacity shortfalls, why is this option being considered?

YUB-YEC-2-24

Reference: YEC 20-Year Resource Plan 5.0 Industrial Development Opportunities (Page 34)

“Without new industrial power loads, surplus hydro energy generation is likely to remain on WAF for at least 15 of the next 20 years, removing any basis today to consider new energy-focused development.”

- Given this statement, why would YEC consider any of the opportunity projects?
- For new industrial loads, how long does YEC have from when it first hears of a project until that project proceeds?
- What criteria does YEC use before committing any resources to plan for new loads? What critical points need to be satisfied to move from the study phase to the planning phase to the construction phase? Generally, what kind of time frame is required?

YUB-YEC-2-25

Reference: YUB-YEC-1-6-e

“Retaining the previous criteria indicates that today the system would be sufficient with all 3 Mirrlees units retired. Based on the experience of Yukon during the January 29 outage, reliable utility standard electrical supply could not be provided by YEC if its system were without the three Mirrlees units today.”

- Over the past 10 years, what has been the frequency of outages like the one that occurred on January 29?
- If the Marsh Lake and Carmacks-Stewart options proceed, could reliable utility standard electrical supply be provided by YEC? Would the Carmacks-Stewart transmission project suffer from the same weaknesses as the Aishihik transmission line?