

YUKON UTILITIES BOARD
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July 7, 2006

David Morrison
President
Yukon Energy Corporation
Box 5920
Whitehorse, Yukon Y1A 5L6

YUKON UTILITIES BOARD		
EXHIBIT A-3		
DAY	ENTERED BY	DATE
	YUB	July 7/06

Dear Mr. Morrison:

Re: Yukon Energy Corporation (YEC) 20-Year Resource Plan: 2006-2025
Board Staff Preliminary Information Requests

In Board Order 2006-5 regarding the review of YEC's 20-Year Resource Plan, the Yukon Utilities Board (Board) included in the procedural schedule a step for Board staff to issue preliminary Information Requests to YEC, if any. Following a review of YEC's Resource Plan, Board staff has prepared a number of Information Requests which are attached. YEC is to respond to these Information Requests by July 21, 2006.

YEC is to send its responses to all interested parties. In addition, the Board requests that YEC make copies of its responses available at the Public Workshop on July 25, 2006 for interested parties.

If YEC has any questions regarding the Information Requests, please contact Pat Wickel at (403) 297-2194 or by e-mail at pat.wickel@gov.ab.ca, or Tom Chan at (403) 297-3267 or by e-mail at tom.chan@gov.ab.ca.

If you have any other questions, please contact me at 667-5058 or in writing at Box 31728, Whitehorse, Yukon, Y1A 6L3, by e-mail to yub@northwestel.net or by fax at 867-667-5059.

Sincerely,

Deana Lemke
Executive Secretary

c.: Interested Parties

PRELIMINARY INFORMATION REQUESTS TO YEC FROM YUB BOARD STAFF

1. The Resource Plan indicates that reliability experts were hired from the University of Saskatchewan in 2004 (under the direction of Dr. Roy Billinton) to review YEC's then established capacity planning criteria (i.e. the criteria as reviewed in the 1992 Resource Plan), including the probabilities inherent in those criteria. Please provide a copy of the report prepared by Dr. Billinton as well as a copy of the terms of reference for the study.

2. The resource Plan indicates that YEC studied the practices of other utilities to arrive at its new planning criteria. In this respect:
 - a. How many utilities in Canada use the same planning criteria as proposed by YEC, i.e. an N-1 criteria in addition to a LOLE criteria? How many use different criteria? What percentage of North American utilities use criteria similar to that proposed by YEC?

 - b. How many other utilities incorporate transmission outages into their probability assessment?

 - c. Of the utilities which do not incorporate transmission outages into the probability assessment, what method do they use to measure the forecast average hours of system outages per year?

3. The Resource Plan indicates that YEC has adopted 2 hrs/year LOLE system-wide capacity planning criteria. The LOLE criteria is then used to determine a capacity shortage in the WAF as early as 2008, as shown on Table 3.5 of the Resource Plan. Please provide the following information with respect to the computer software and the data used by YEC to calculate LOLE, unless it is provided in the Billinton Report:
 - a. Describe the software used for calculating LOLE. Is it a commercially available software or one developed in-house? Does it use analytical methods, or Monte Carlo simulation, or other methods?
 - i. If analytical, does it use the capacity outage probability table method, or the equivalent load method, or other method?

 - ii. If Monte Carlo, how many iterations were used to achieve statistical significance? How does the software use random variables to determine how long generating units will remain in a state of availability?

- b. Was the annual LOLE computed over 8,760 hourly peak loads, or 365 daily peak loads, or another period of time? Provide the system load data as it was used in the model, either chronological load, load duration curves, or in any other form that was used by the model. (Provide data in Excel electronic format)
 - c. With respect to generation data used in the calculation of LOLE, provide a complete list of generating units including unit name, Maximum Continuous Rating (MCR), forced outage rate (assuming a two-state model for generators), seasonal derates, if any, and planned outage rates.
 - d. If the software uses a multi-state model for generator outages, provide the state probabilities of outage and explain how the model treats multi-state generating units.
 - e. For each generator, please provide YEC's number of outage hours per year for the past 10 years to support the probabilities of outage used in the model.
 - f. Does the software model hydro units differently than it does for thermal units? For example, does it account for seasonal minimum and maximum outputs and energy limitations on hydro generation?
 - g. How was planned maintenance outages accounted for in the software?
 - i. Does the software develop a maintenance schedule? If yes, describe the method it uses for scheduling unit maintenance.
 - ii. Was a maintenance schedule produced externally and entered into the model? If yes, please provide it.
4. Does the resource plan account for YECL production in your forecasting models? Have you accounted for any potential expansion of YECL production and/or new YECL capacity projects?
5. The Resource Plan states that the LOLE criteria provide an overall system measure that assesses the normal balance of the system including industrial loads, and the probabilities of experiencing outages due to having inadequate generation (and transmission) installed on the system. In this regard:
- a. Do the LOLE calculations shown on Table 3.5 take into account transmission outages?
 - b. If yes, provide the transmission outage data used by the model.

- c. Explain how the model accounts for transmission outages. (For example, does the model produce equivalent multi-state units at certain buses combining transmission outage probabilities with the outage probabilities of the generators that would be affected by transmission outages?)

6. The Resource Plan also indicates that YEC determined it to be appropriate to incorporate a standard to address the potential for sustained emergency conditions. This standard calls for each system (WAF and MD) to be able to carry the forecast peak winter loads under the largest single contingency (N-1), which in the case of WAF would be the loss of the Aishihik line and attendant 31.3 MW of generation. In this respect:
 - a. The N-1 criteria look at a single outage event that may happen at the time of the annual peak load. What is the likelihood of an outage of the Aishihik line at the time of the annual peak load? Provide any historical outage records (duration and timing) for the Aishihik line to support your answer.
 - b. If the probabilities of transmission outages have been accounted for in the LOLE calculation, why does YEC consider it necessary to adopt the N-1 criteria?
 - c. Did YEC perform a "risk-cost evaluation"¹ to put risk and economic factors on a unified scale of monetary value? If not, why, not?
 - d. Is the single-contingency, the N-1 principle, a mandate or imperative requirement?
 - e. What are the economic and operational consequences of retaining the previous capacity planning criteria?
 - f. What are the economic and operational consequences of adopting the LOLE planning criteria without the N-1 criteria?

7. Table 3.5 shows the timing of capacity requirements in the WAF for the previous criteria and the newly adopted LOLE, and the N-1 criteria. The table also shows annual WAF peak load forecast from 2005 to 2012. Clarify which load growth forecast has been used in Table 3.5. Is it the base case, low sensitivity case, base case including mines, or high sensitivity case including mines?

¹ The risk evaluation should include expected frequency of load curtailment and expected duration of load curtailment indices.

8. Please provide supporting data to verify the assumptions made to arrive at the near-term non-industrial forecast. Specifically:
 - a. YEC's recorded electricity consumption.
 - b. Bureau of Statistics population growth projections.
 - c. City of Whitehorse population increases.
 - d. Provide the per capita electricity use in the Yukon and expand on the assumed 0.5% increase, which is referenced as being assumed by other Canadian utilities.
 - e. Please provide historical secondary sales numbers for the past 10 years (on an annual basis) and also provide forecast secondary sales (on an annual basis) to 2016.
 - f. As new loads come on to the system, how does YEC expect to deal with secondary sales?

9. The application indicates that new generating capacity is not planned for opportunity loads as they are interruptible. Has YEC accounted for interruptible load becoming firm load in the future? If yes, please explain.

10. YEC has identified a number of near-term projects to address capacity deficits during the 2006 to 2012 time period and their timing and sequencing are summarized in Table 4.15. In this respect:
 - a. Has the YEC conducted any studies to determine an optimal expansion sequence for these near-term projects so that the planning criteria are met and rate increases are minimized? If yes, can these studies be provided?
 - b. What would be the timing and sequencing of projects under the four-load forecast scenarios?
 - c. Please provide the business cases and all economic models (electronic or otherwise) used for each of the four near-term projects as currently proposed.
 - d. Without a capacity requirement to serve the Faro mine, what has happened to that previously installed capacity? Would that excess capacity contribute to the reliability assessment?

11. For all the near-term projects to reinforce the power system, please provide the summary of the following cost estimations (in Excel electronic spreadsheet format) and associated details of the respective calculations for each year from the beginning to the completion of the projects:
 - a. Annual additional capital expenditure and the present value of the total expenditure.
 - b. Annual fuel cost for new generation.
 - c. Annual additional operation and maintenance expenses.
 - d. Annual additional revenue requirement and its calculation.
 - e. Peak transmission system losses in MW and levelized annual transmission losses in MWh and their calculation.
 - f. Please explain how the \$3-million threshold was determined for YUB review of YEC projects.
12. In evaluating new generation options to supply future industrial developments, the Resource Plan focuses on energy rather than capacity requirements. (Section 5.3 on page page 5-27 of the 20-Year Resource Plan). Would YEC consider extending the planning criteria to include the annualized expected energy not supplied, MWh/yr (EENS) indices for the options being considered taking into consideration constraints of the transmission network? If not, why not?
13. Reference: 4.3.1 Aishihik Third Turbine Project
Please provide the economic analysis and models which reflect the rate impacts of proceeding with this project.
14. Reference 4.3.3 Carmacks-Stewart Transmission Project
Please provide the economic evaluation and models used to support this project. Assuming no new mine projects, can this project displace or defer any diesel generation?
15. Reference 4.3.4 Mirrlees Life Extension Project.
 - a. If the Carmacks-Stewart Transmission project proceeds, is the Mirrlees Life Extension Project necessary?
 - b. If YECL's Fish Lake Unit is expanded, would that alleviate the need to expand at Mirrlees?

- c. Please provide runtime hours for each unit at Mirrlees on an annual basis from 1998 to 2005 inclusive. On an annual basis, how often were the units operating concurrently?
 - d. Please provide the economic analysis and electronic models for the Mirrlees Expansion Project.
- 16. Reference 4.3.5 Whitehorse Diesel Replacement and Expansion Project
Please provide the economic analysis for the above noted project including details on the assessment of the impact on rates to end-use customers.
- 17. Reference 6.2 Role of Public Involvement
Please explain your consultation process and any issues that arose from that process.
- 18. What consultation has taken place with YECL in the formulation of this plan? If there has not been any consultation with YECL, why not? Have you accounted for any potential expansion of YECL production?