YUKON ENERGY CORPORATION

APPLICATION FOR AN ENERGY PROJECT CERTIFICATE
AND AN ENERGY OPERATION CERTIFICATE REGARDING THE
PROPOSED WHITEHORSE DIESEL-NATURAL GAS CONVERSION PROJECT

REVISED ROUND 1 INTERROGATORY RESPONSES FILED

March 11, 2014

TOPIC:

REFERENCE: Page 29

"... The annual fuel costs estimates in Table 4-3 also assume operation of these new units to enhance hydro storage for use in wintertime..." and

Page 30

"Operation of the new gas-fired generation capacity can be used, however, to assist in storing water at Aishihik and (to a much lesser extent) at Mayo during the summer... thereby allowing added hydro generation capability to be utilized in peak winter months..."

PREAMBLE:

QUESTION:

a) For each of the months of June, July, August, and September please provide, in table format, the following actual 2013 data (with Alexco) and the projected 2014 data (without Alexco and with Fish Lake #1), and the projected 2016 data (base case):
    i. The available Whitehorse Rapids and Mayo hydro capacities, in MW, that must either be used or spilled;
    ii. The monthly average load in MW;
    iii. The average daytime peak load in MW; and
    iv. The average minimum night time load in MW.

b) If gas fired generators can usefully generate power in the summer that results directly in water storage in Aishihik Lake (or Mayo Lake) for winter usage, would other forms of renewable energy generation available in summer (e.g. solar PV or wind) not also result in stored water that can be used in winter?

ANSWER:

(a)

Please see Table 1 below.

Please note that YEC does not forecast daytime/nighttime peak. Water spillage would be based on energy demand, capacity as well as water storage license restrictions.

Table 1:
Installed capacity for Whitehorse Rapids and Mayo Hydro Generation Stations, and Monthly Average Load Data for YEC

		2013		
		July	**August**	**September**
Installed Capacity				
Whitehorse Rapid GS	MW	40	40	40
Mayo GS	MW	5.4	5.4	5.4
2013 Actual				
Monthly Average Load	MW	43.1	37.1	41.3
The average daytime peak load	MW	42	43.5	42.7
The average night time peak load	MW	39.1	40.4	40.2
Monthly Average Load				
2014, Base Case no Alexco	MW	37.5	38.7	43.9
2016, Base Case no Alexco	MW	39.2	40.6	45.9

Notes:
1. Daytime for average peak is assumed between 7 am and 7 pm.
2. Average peak numbers do not include internal loads and line losses.

Revised Response

Please see Revised Table 1 below. In the original response Mayo GS capacity erroneously excluded Mayo B. Revised Table 1 below provides total Mayo GS installed capacity including Mayo B, as well as the average night time minimum load as requested.

Revised Table 1 also includes the month of June which was not included in the original response.

Table 1 REVISED:
Installed capacity for Whitehorse Rapids and Mayo Hydro Generation Stations, and Monthly Average Load Data for YEC

		2013			
		June	**July**	**August**	**September**
Installed Capacity					
Whitehorse Rapid GS	MW	40	40	40	40
Mayo GS	MW	15.4	15.4	15.4	15.4
2013 Actual					
Monthly Average Load	MW	35.2	43.1	37.1	41.3
The average daytime peak load	MW	42.7	42	43.5	42.7
The average night time minimum load	MW	25.8	25.8	28	26
Estimated Monthly Average Load					
2014, Base Case no Alexco	MW	39.3	37.5	38.7	43.9
2016, Base Case no Alexco	MW	41.4	39.2	40.6	45.9

Notes:
1. Daytime for average peak is assumed between 7 am and 7 pm.
2. Average peak and minimum night time load numbers do not include internal loads and line losses.

(b)

Other renewable generation sources also provide some water storage in summer months, which then may be used for winter load supply. For example, as provided in Figure 5-3 in Overview of YEC's 20 Year Resource Plan: 2011-2030, with 21 MW Ferry Hill wind project the stored water in summer could displace up to 14.6 GW.h diesel generation in winter at 545 GW.h[1] load level. This ability to provide stored water was included in the Overview assessment of other renewable resource options such as wind.

[1] Scenario A load level for 2015 examined in 2011-2030 Resource Plan with Victoria Gold mine.

TOPIC:

REFERENCE: Page 35 Table 4-5

PREAMBLE:

QUESTION:

a) To more fully understand the fuel price risk please provide and expanded Table 4-5 to include gas purchase costs of $5.50, $6.50, $7.50, and $8.50 per MMBtu.

ANSWER:

(a)

Please see Table 1 below for the requested information. Please also note response to YUB-YEC-1-44 for updated LNG haul cost estimates.

Table 1:
Expanded Range of LNG Fuel Cost Savings

LNG Fuel Cost Saving ($/kW.h)			
New Diesel	LNG		LNG Saving
		A-Train from Calgary with 18% premium	
0.246	0.115	gas at $3.5/MMBTu, efficiency 44%	0.131
0.200	0.115	gas at $3.5/MMBTu, efficiency 44%	0.085
0.246	0.135	gas at $4.5/MMBTu, efficiency 40%	0.111
0.200	0.135	gas at $4.5/MMBTu, efficiency 40%	0.065
0.246	0.143	gas at $5.5/MMBTu, efficiency 40%	0.103
0.246	0.152	gas at $6.5/MMBTu, efficiency 40%	0.094
0.246	0.161	gas at $7.5/MMBTu, efficiency 40%	0.085
0.246	0.169	gas at $8.5/MMBTu, efficiency 40%	0.077
		Tridem from Calgary with 10% premium	
0.246	0.133	gas at $3.5/MMBTu, efficiency 44%	0.113
0.200	0.133	gas at $3.5/MMBTu, efficiency 44%	0.067
0.246	0.154	gas at $4.5/MMBTu, efficiency 40%	0.092
0.200	0.154	gas at $4.5/MMBTu, efficiency 40%	0.046
0.246	0.163	gas at $5.5/MMBTu, efficiency 40%	0.083
0.246	0.171	gas at $6.5/MMBTu, efficiency 40%	0.075
0.246	0.180	gas at $7.5/MMBTu, efficiency 40%	0.066
0.246	0.189	gas at $8.5/MMBTu, efficiency 40%	0.057

Revised Response

Please see the revised Table 1 below, which includes LNG fuel cost savings with higher LNG fuel cost with $1/MMBtu increments compared to 20.0 cents/kW.h and 24.6 cents/kW.h diesel fuel costs.

Please also note the response to YUB-YEC-1-44 provides updated LNG haul cost estimates.

Table 1 REVISED:
Expanded Range of LNG Fuel Cost Savings

LNG Fuel Cost Saving ($/kW.h)

New Diesel	LNG		LNG Saving
		A-Train from Calgary with 18% premium	
0.246	0.115	gas at $3.5/MMBTu, efficiency 44%	0.131
0.200	0.115	gas at $3.5/MMBTu, efficiency 44%	0.085
0.246	0.135	gas at $4.5/MMBTu, efficiency 40%	0.111
0.200	0.135	gas at $4.5/MMBTu, efficiency 40%	0.065
0.246	0.143	gas at $5.5/MMBTu, efficiency 40%	0.103
0.246	0.152	gas at $6.5/MMBTu, efficiency 40%	0.094
0.246	0.161	gas at $7.5/MMBTu, efficiency 40%	0.085
0.246	0.169	gas at $8.5/MMBTu, efficiency 40%	0.077
0.200	0.143	gas at $5.5/MMBTu, efficiency 40%	0.057
0.200	0.152	gas at $6.5/MMBTu, efficiency 40%	0.048
0.200	0.161	gas at $7.5/MMBTu, efficiency 40%	0.039
0.200	0.169	gas at $8.5/MMBTu, efficiency 40%	0.031
		Tridem from Calgary with 10% premium	
0.246	0.133	gas at $3.5/MMBTu, efficiency 44%	0.113
0.200	0.133	gas at $3.5/MMBTu, efficiency 44%	0.067
0.246	0.154	gas at $4.5/MMBTu, efficiency 40%	0.092
0.200	0.154	gas at $4.5/MMBTu, efficiency 40%	0.046
0.246	0.163	gas at $5.5/MMBTu, efficiency 40%	0.083
0.246	0.171	gas at $6.5/MMBTu, efficiency 40%	0.075
0.246	0.180	gas at $7.5/MMBTu, efficiency 40%	0.066
0.246	0.189	gas at $8.5/MMBTu, efficiency 40%	0.057
0.200	0.163	gas at $5.5/MMBTu, efficiency 40%	0.037
0.200	0.171	gas at $6.5/MMBTu, efficiency 40%	0.029
0.200	0.180	gas at $7.5/MMBTu, efficiency 40%	0.020
0.200	0.189	gas at $8.5/MMBTu, efficiency 40%	0.011

TOPIC:

REFERENCE: Page 36 Table 4-6

PREAMBLE:

QUESTION:

a) Please provide an expanded Table 4-6 with diesel capital cost options that are $5 million and $ 10 million lower that provided for, and with gas prices that range up to $8.50 per MMBtu (in $1.00 per MMBtu increments).

ANSWER:

(a)

Please see response to YCS/LE-YEC-1-42 for the annual ratepayer impact analysis with lower New Diesel capital cost and higher LNG fuel costs with $1/MMBtu increments.

Revised Response

Please see Table 1 below for the analysis with higher LNG fuel costs with $1/MMBtu increments and $5 million lower New Diesel alternative capital cost as requested.

Table 1: Ratepayer Cost Savings Sensitivity to Project Capital Costs and Fuel Cost Saving Risks

(with $5 million lower new diesel capital cost and higher LNG fuel costs)

Maximum Annual LNG Capital Cost Penalty at 13.1 MW ($million/yr)

		0.868	**1.021**	**1.173**	**1.326**	**1.479**
		Table 4-3	plus 5%	plus 10%	plus 15%	plus 20%
LNG Fuel Cost Saving						
($/kW.h)		(Minimum LTA Displaced Diesel [GW.H/yr] to Break Even)				
0.10	$5.5/MMBTu	8.5	10.0	11.4	12.9	14.4
0.09	$6.5/MMBTu	9.2	10.9	12.5	14.1	15.7
0.09	$7.5/MMBTu	10.2	11.9	13.7	15.5	17.3
0.08	$8.5/MMBTu	11.3	13.3	15.3	17.2	19.2

Notes:

1. For this table New Diesel capital cost assumed to be $5 million lower than shown in Table 4-4 of Part 3 application as requested.
2. Please see YCS/LE-1-43 for LNG fuel cost savings (LNG fuel cost with $1/MMBtu increments compared to 24.6 cents/kW.h new diesel fuel cost).

Please see Table 2 below for the analysis with higher LNG fuel costs with $1/MMBtu increments and $10 million lower New Diesel alternative capital cost as requested.

Table 2: Ratepayer Cost Savings Sensitivity to Project Capital Costs and Fuel Cost Saving Risks

(with $10 million lower new diesel capital cost and higher LNG fuel costs)

Maximum Annual LNG Capital Cost Penalty at 13.1 MW ($million/yr)

		1.262	**1.415**	**1.567**	**1.720**	**1.873**
		Table 4-3	plus 5%	plus 10%	plus 15%	plus 20%
LNG Fuel Cost Saving						
($/kW.h)		(Minimum LTA Displaced Diesel [GW.H/yr] to Break Even)				
0.10	$5.5/MMBTu	12.3	13.8	15.3	16.8	18.3
0.09	$6.5/MMBTu	13.4	15.1	16.7	18.3	19.9
0.09	$7.5/MMBTu	14.8	16.6	18.3	20.1	21.9
0.08	$8.5/MMBTu	16.4	18.4	20.4	22.4	24.3

Notes:

1. For this table New Diesel capital cost assumed to be $10 million lower than shown in Table 4-4 of Part 3 application as requested.
2. Please see YCS/LE-1-43 for LNG fuel cost savings (LNG fuel cost with $1/MMBtu increments compared to 24.6 cents/kW.h new diesel fuel cost).