YUKON ENERGY CORPORATION

2017/2018 GENERAL RATE APPLICATION
COMPLIANCE FILING
INTERROGATORY RESPONSES FILED

April 9, 2019

ATCO Electric Yukon
(AEY)

TOPIC: **Time-limited Rider R**

REFERENCE: Page 1-8

QUOTE:

PREAMBLE: Rider R is currently used by AEY.

QUESTION:

a) Please confirm YEC does not intend to use Rider "R" for its time-limited rider to collect revenue shortfalls in 2017, 2018, and 2019.

ANSWER:

(a)

Yukon Energy is amenable to using another Rider designation for the time-limited rider.

TOPIC: **LWRF**

REFERENCE: "320. However, the Board is of the view that the current DCF mechanism is complex and does not show the hydro generation and thermal generation in a given year when actuals are determined because the actuals are based on modelled results. The Board finds that a simpler mechanism for adjusting for variances between the approved forecast for hydro generation and thermal generation and actual hydro generation and thermal generation in a test year is needed." Board Order 2018-10

QUOTE:

PREAMBLE: AEY would like to understand the DCF/LWRF simplifications proposed in the compliance filing.

QUESTION:

a) Please identify and list out the simplifications and/or efforts to reduce the complexity of the proposed LWRF mechanism. Please explain the simplifications and how they work to reduce the complexity of the LWRF (compared to the formerly proposed DCF).

b) Did YEC seek or evaluate any alternative opinions in determining the proposed LWRF? If so, please list out the alternatives and why they were not included in or evaluated within the application.

ANSWER:

(a)

The key simplification introduced into the LWRF mechanism is the Fixed Change Factor. For further information on the recommended approach to the LWRF see YUB-YEC-1-13.

(b)

Yes. For further information on the recommended approach to the LWRF and the alternatives that have been reviewed in the current proceeding see YUB-YEC-1-13. The Compliance Filing implemented the directives of the Board in Order 2018-10.

TOPIC: **LWRF**

REFERENCE: Attachment 2.1-1, Attachment 2.1-2, and Tables 1, 2, and 3 in "LWRF and ERA for 2017 and 2018 ext.xlsx"

QUOTE:

PREAMBLE: AEY is interested in more information regarding YEC's LWRF and ERA.

QUESTION:

a) For 2017, please confirm Tables 1, 2, and 3 in "LWRF and ERA for 2017 and 2018 ext.xlsx" assume all forecasts equal actual values for 2017.

b) Please update Tables 1, 2, & 3 to include another column for 2017 to show what the ERA charge and LWRF transaction would have been if:
   i. YEC's original forecasts for wholesales, grid load, thermal generation forecast, been accepted; and
   ii. Actual results came in as they occurred in 2017; and
   iii. the proposed new rules for LWRF and ERA are also accepted.

ANSWER:

(a)

As directed by the Board in its Order 2018-10, the 2017 test year in the 2017/18 GRA uses the actuals for 2017.

(b)

Please see Tables 1, 2 and 3 that include illustrative numbers for 2017 based on assumptions indicated in the question. Please note that the 2017 assessment of LTA thermal under these assumptions retained, for simplicity, the Fixed Change Factor from the 2018 assessments (in practice, a change would be done to reflect the different LWRF/DCF Term Sheet table used for the original LTA GRA thermal forecast).

Table 1: LWRF for 2017 and 2018 [including Illustrative for 2017][1]

Line No		Illustrative with Original 2017 GRA Forecast	2017 Compliance Filing	2018		Notes
				preliminary		
L1a	Diesel Fuel Cost per kW.h	26.333	27.273	26.333	cents/kW.h	GRA Application Average Fuel cost (2017/18 GRA Application). 2017 Actuals as per Compliance Filing.
L1b	LNG Fuel Cost per kW.h	14.668	14.764	14.668	cents/kW.h	
L1c	GRA YIS firm Load forecast	420,398	446,458	420,265	MW.h	
L1d	GRA LTA Thermal Generation forecast	14,146	13,261	16,355	MW.h	
L1e	GRA Fixed Change Factor	45.3%	45.3%	45.3%		LTA thermal generation share of firm YIS load change
Calculation of Thermal Cost to Charge (Refund) LWRF						
	Assumptions					
L2	YEC Grid load	446,458	446,458	450,086	MW.h	Actual
L3	Fish Lake	7,103	7,103	5,458	MW.h	Actual
L4=L2+L3	Total Grid load	453,561	453,561	455,544	MW.h	
	Assumed Actual Generation Sources					
L5	YECL Fish Lake	7,103	7,103	5,458	MW.h	Actual
L6	YEC Hydro	431,951	431,951	412,768	MW.h	assumed actual (L2-L7-L8)
L7	YEC Thermal	14,474	14,474	37,319	MW.h	Actual
	Diesel	4,618	4,618	7,189	MW.h	Actual
	LNG	9,856	9,856	30,130	MW.h	Actual
L7a	*YEC Diesel/LNG charged to capital, RFID and maintenance*	1,213	1,213	1,361	MW.h	Actual
	Diesel	995	995	1,003	MW.h	Actual
	LNG	218	218	358	MW.h	Actual
L7b=L7-L7a	*YEC Net Diesel/LNG*	13,261	13,261	35,958	MW.h	Actual
	Diesel	3,623	3,623	6,186	MW.h	Actual
	LNG	9,638	9,638	29,772	MW.h	Actual
L8	YEC Wind	33	33	-	MW.h	Actual
L9	Total Grid load	453,561	453,561	455,544	MW.h	
	LTA Expected Generation Sources					
L10	YECL Fish Lake (expected)	8,536	7,103	8,391	MW.h	Based on YEC forecast in 2017/18 GRA [2017 is based on AEY 2016/17 GRA Compliance Filing].
L11	YEC Wind (expected)	33	33	-	MW.h	Adjusted to reflect actual facility change
L12=L9-L10-L11	YEC Grid load net of expected Fish Lake and Wind	444,992	446,425	447,153	MW.h	
L13=L1d	LTA GRA Thermal Generation Forecast	14,146	13,261	16,355	MW.h	
L14=(L12-(L1c-L11)xL	LTA Thermal change due to YIS load change	11,156	-	12,181	MW.h	GRA Fixed Change Factor times change from forecast. Net of Fish Lake and wind impacts.
L15=L13+L14	Total Expected YEC Thermal Generation	25,302	13,261	28,536	MW.h	
L16=L15	Expected YEC Thermal Generation in Rates	25,302	13,261	28,536	MW.h	
	Diesel	*3,623*	*3,623*	*6,186*	MW.h	Expected thermal less expected LNG.
	LNG	*21,680*	*9,639*	*22,350*	MW.h	90% of expected thermal, subject to not exceeding expected thermal less actual diesel.
L17=L7	Actual YEC Net Thermal Generation	13,261	13,261	35,958	MW.h	Net of capital, RFIS and maintenance thermal (L7b)
	Diesel	*3,623*	*3,623*	*6,186*	MW.h	
	LNG	*9,638*	*9,638*	*29,772*	MW.h	
L18=L17-L16	YEC Thermal Generation to be included in LWRF	- 12,041	- 0	7,422	MW.h	
	YEC Diesel Generation to be included in LWRF	-	-	-	MW.h	
	YEC LNG Generation to be included in LWRF	- 12,041	- 0	7,422	MW.h	
L19=L1axL18a+L1bxL	Incremental YEC Thermal Generation Cost to Charge (Refund) LWRF ($000s)	($1,766)	($0)	$1,089		

Note: 2017 Compliance Filing column reflects Compliance Filing for YUB Order 2018-10 (including actual fuel prices, and the assumption that GRA forecasts equal actuals).

[1] Please note that the 2017 Compliance Filing and 2018 columns include corrections from the Compliance Filing at various rows that modify certain numbers. The 2018 payment from LWRF to YEC is increased due to correction of L14 (to reflect actual load net of Fish Lake variance from expected).

Table 2: LWRF Continuity Schedule

Line	Activity	Illustrative with Original 2017 GRA Forecast	2018 (Adjusted for 2017 with Origianl GRA Forecast)	2017 Compliance Filing	2018
		($000s)	($000s)	($000s)	($000s)
A	**Opening Balance[1]**	**$9,485**	**$8,484**	**$9,485**	**$6,710**
B	Incremental Diesel Generation Cost to Charge/(Refund)[2] to LWRF	($1,766)	$1,089	($0)	$1,089
C=B	Total LWRF operation for YEC				
	YEC pays to LWRF	$1,766	$0	$0	$0
	YEC withdraws from LWRF	$0	($1,089)	$0	($1,089)
D=A+C	**LWRF Balance after Annual Operation**	**$11,251**	**$7,395**	**$9,485**	**$5,621**
E	**Interest on LWRF Balance[3]**	**$94**	**$76**	**$86**	**$76**
F=D+E	**LWRF Balance after Interest charge**	**$11,345**	**$7,472**	**$9,571**	**$5,698**
G	**Rider E (Rebate)/Collections [January - December]**	**($2,861)**	**($2,874)**	**($2,861)**	**($2,874)**
H=F+G	**LWRF Ending Balance**	**$8,484**	**$4,598**	**$6,710**	**$2,824**
I	**LWRF (Rebate)/Collections January - March 31, 2019 (forecast)**		**($847)**		**($847)**
J=H+I	**Forecast LWRF Balance, After (Rebate)/Collections to March 31**		**$3,751**		**$1,977**
K	**LWRF Cap [4]**		**`+/-8000**		**`+/-8000**
L=J-K	**LWRF Rebate/(Collections) Required**		**$0**		**$0**

Notes:
1. Opening Balance is based on 2016 DCF ending balance as provided in DCF 2016 Annual Filing.
2. Based on calculations in Table 1.

3. Per the March 11, 1996 letter recording the settlements [provided as Exhibit B-16 in the 2008/2009 GRA] the DCF fund is to attract interest based upon the short/intermediate term bond rates in which the Companies may invest the fund and any negative balances would only attract interest at the lowest short-term borrowing rate available to the Companies through a line of credit.

4. LWRF cap based on LWRF Term Sheet, YEC 2017-18 GRA Compliance Filing, Appendix 2.1, Attachment 2.1-1.

Table 3: ERA Determination for 2017 and 2018[2]

	Illustrative with Original 2017 GRA Forecast	2017 Compliance Filing	2018	
			preliminary	
A Wholesales Variance for AEY (MW.h)				
Actual wholesales	328,426	328,426	332,270	A1
GRA approved wholesales assuming Fish Lake LTA generation	309,000	328,426	314,700	A2 [See note 1]
Fish Lake generation adjustment (expected LTA less actual)	1,433	0	2,933	A3 [See note 2]
Change in wholesales for ERA	**17,993**	**0**	**14,637**	A4=A1-A2-A3
B YEC Cost Impact per kW.h change in Wholesales				
Losses (%)	8.06%	8.06%	9.34%	B1 [Actuals]
Total YEC's actual generation net of secondary and Fish Lake & wind variances(MWh)	444,992	446,425	447,153	B2 [See note 2]
GRA approved firm load forecast (MWh), net of expected wind (MWh)	420,365	446,425	420,265	B3 [See note 1]
YEC incremental generation relative to GRA approved (MW.h)	24,627	0	26,889	B4=B2-B3
YEC's actual LTA Thermal Generation (MWh)	25,302	13,261	28,536	B5 [See note 2]
GRA LTA Thermal Generation (MWh)	14,146	13,261	16,355	B6 [See note 1]
YEC Incremental thermal generation relative to GRA approved (MWh)	11,156	0	12,181	B7=B5-B6
Incremental thermal generation for incremental total generation (%)	45.30%	45.30%	45.30%	B8 =B7/B4
Thermal Generation cost per GRA ($/kW.h)	0.1634	0.1818	0.1720	B9 [See note 2]
YEC thermal cost change ($/kWh wholesales)	**0.0800**	**0.0890**	**0.0852**	B10=B9*B8*(1+B1)
C YEC Revenue Impact per kW.h change in Wholesales				
Rate Schedule 42 Energy Charge ($/kW.h wholesales)	**0.08298**	**0.08298**	**0.08298**	C1
Average YEC rider applicable to AEY retails ($/kWh wholesales)	**0.01975**	**0.01975**	**0.02636**	C2 [See note 3]
D Net thermal cost impact on YEC ($000)				
Wholesale Change: Cost Impact (YEC thermal generation costs)	**1,439**	**0**	**1,247**	D1=A4*B10
Wholesale Change: Revenue Impact (YEC revenues)	**1,967**	**0**	**1,844**	D2=A4*(C1+C2)+A3*C1
Cost change>revenue change ("Yes"=1, "No"=0)	**0**	**1**	**0**	D3=is D1>D2 (absolute)
ERA Charge (rebate) to AEY [Net added cost (cost saving) for YEC]	**0**	**0**	**0**	D4=D3*(D1-D2)

Notes:

1. 2017 Compliance Filing is based on actuals as per YUB Order 2018-10; 2018 forecast as directed by YUB in Order 2018-10 [both subject to 2017/18 GRA Compliance Filing approval].
2. Please see LWRF calculations in Table 1 for actual thermal generation numbers and incremental thermal generation percentages as well as average fuel costs per kW.h.
3. YEC Rider J revenues include actual Rider J [pre-2017/18 GRA] plus increase in Rider J based on YEC's 2017/18 GRA Compliance Filing. Average Rider is estimated total Rider J revenues [including 2017/18 GRA increase] from AEY retail customers divided by wholesales net of Fish Lake adjustments.

[2] Please note that the 2017 Compliance Filing and 2018 columns include corrections from the Compliance Filing at various rows that modify certain numbers but do not change the overall result (i.e., no ERA is applicable). These corrections link to LTA thermal at actual load as per Table 1.

TOPIC: **LWRF Operation Examples**

REFERENCE: Table 2.1-3, Year 4, L13 & L14

QUOTE:

PREAMBLE: AEY seeks more information about the operation of the LWRF.

QUESTION:

a) Please explain how LTA GRA Thermal Generation Forecast, 27,126 MWh, was determined.

b) Please provide an excel copy of Table 2.1-3.

ANSWER:

(a)

There is an error in Table 2.1-3, Year 4, L13 & L14. The table should show the following:

L13 = L1d	LTA GRA Thermal Generation Forecast	14,000 MWh
L14 = (L2-L1c) x L1e	LTA Thermal change due to YIS load change	12,870 MWh
L15 = L13+L14	Total Expected YEC Thermal Generation	**26,870 MWh**

This error is corrected in the excel copy of Table 2.1-3 provided as Attachment 1 to AEY-YEC-1-4(b). There is no impact to the 2017 and 2018 test year from this error.

L13 is the LTA GRA thermal generation forecast included in the 2018 test year forecast. L14 is the LTA thermal change due to the YIS load change. To determine this, the Fixed Charge Factor is applied as follows:

1. The change on firm load is determined by taking the actual YEC grid load of 448,600 MWh minus the forecast GRA YIS firm load forecast of 420,000 MWh. This provides a difference of 28,600.

2. The Fixed Change Factor of 45% is applied to the 28,600 increment in load to determine the share of thermal generation for the added load. This provides 12,870 MWh.

3. The 12,870 MWh is added to the GRA forecast thermal generation of 14,000 MWh and provides 26,870 MWh of thermal generation expected at the actual grid load of 488,600.

(b)

Please see AEY-YEC-1-4(b) Attachment 1. In addition to providing an excel version of the revised and corrected Table 2.1-3, this also includes a revised and corrected version of Table 2.1-2.

Table 2.1-3 LWRF Operation Examples for 5 Load Forecast Cases

Line No					Notes
L1a	Diesel Fuel Cost per kW.h		26.333	cents/kW.h	GRA Application Average Fuel cost (2017/18 GRA Application)
L1b	LNG Fuel Cost per kW.h		14.668	cents/kW.h	
L1c	GRA YIS firm Load forecast		420,000	MW.h	
L1d	GRA LTA Thermal Generation forecast		14,000	MW.h	
L1e	GRA Fixed Change Factor		45%		LTA thermal generation share of firm YIS load change

Calculation of Thermal Cost to Charge (Refund) LWRF

Year 1 - Actual Wind and Fish Lake at Forecast; Actual Thermal Generation Below LTA Expected

	Assumptions				
L2	YEC Grid load		415,000	MW.h	assumed actual
L3	Fish Lake		8,730	MW.h	assumed actual
L4=L2+L3	Total Grid load		423,730	MW.h	
	Assumed Actual Generation Sources				
L5	AEY Fish Lake		8,730	MW.h	assumed actual
L6	YEC Hydro		409,000	MW.h	assumed actual
L7	YEC Thermal (net of capital, insurance and maintenance)		6,000	MW.h	assumed actual
L7a	*YEC Diesel (net of capital, insurance and maintenance)*		*3,000*	*MW.h*	*assumed actual*
L7b	*YEC LNG (net of capital, insurance and maintenance)*		*3,000*	*MW.h*	*assumed actual*
L8	YEC Wind		-	MW.h	assumed actual
L9	Total Grid load		423,730	MW.h	
	LTA Expected Generation Sources				
L10	AEY Fish Lake (expected)		8,730	MW.h	AEY Fish Lake long term average hydro generation based on YUB Order 2014-06.
L11	YEC Wind (expected)		-	MW.h	YEC 2017/18 GRA Compliance Filing
L12=L9-L10-L11	YEC Grid load net of expected Fish Lake and Wind		415,000	MW.h	
L13=L1d	LTA GRA Thermal Generation Forecast		14,000	MW.h	
L14=(L2-L1c)xL1e	LTA Thermal change due to YIS load change	-	2,250	MW.h	
L15=L13+L14	Total Expected YEC Thermal Generation		11,750	MW.h	
L16=L15	Expected YEC Thermal Generation in Rates		11,750	MW.h	
	Diesel		*3,000*	MW.h	Expected thermal less expected LNG.
	LNG		*8,750*	MW.h	90% of expected thermal, subject to not exceeding expected thermal less actual diesel.
L17=L7	Actual YEC Net Thermal Generation		6,000	MW.h	assumed net actual
	Diesel		*3,000*	MW.h	
	LNG		*3,000*	MW.h	
L18=L17-L16	YEC Thermal Generation to be included in LWRF	-	5,750	MW.h	
L18a	YEC Diesel Generation to be included in LWRF		-	MW.h	
L18b	YEC LNG Generation to be included in LWRF	-	5,750	MW.h	
L19=L1axL18a+L1bxL18b	Incremental YEC Thermal Generation Cost to Charge (Refund) LWRF ($000s)		($843)		

Year 2 - Actual Wind and Fish Lake at Forecast; Actual Thermal Generation Below Expected

	Assumptions				
L2	YEC Grid load		425,000	MW.h	assumed actual
L3	Fish Lake		8,730	MW.h	assumed actual
L4=L2+L3	Total Grid load		433,730	MW.h	
	Assumed Actual Generation Sources				
L5	AEY Fish Lake		8,730	MW.h	assumed actual
L6	YEC Hydro		421,000	MW.h	assumed actual
L7	YEC Thermal (net of capital, insurance and maintenance)		4,000	MW.h	assumed actual
L7a	*YEC Diesel (net of capital, insurance and maintenance)*		*3,000*	*MW.h*	*assumed actual*
L7b	*YEC LNG (net of capital, insurance and maintenance)*		*1,000*	*MW.h*	*assumed actual*
L8	YEC Wind		-	MW.h	assumed actual
L9	Total Grid load		433,730	MW.h	
	Expected Generation Sources				
L10	AEY Fish Lake (expected)		8,730	MW.h	AEY Fish Lake long term average hydro generation based on YUB Order 2014-06.
L11	YEC Wind (expected)		-	MW.h	YEC 2017/18 GRA Compliance Filing
L12=L9-L10-L11	YEC Grid load net of expected Fish Lake and Wind		425,000	MW.h	
L13=L1d	LTA GRA Thermal Generation Forecast		14,000	MW.h	
L14=(L2-L1c)xL1e	LTA Thermal change due to YIS load change		2,250	MW.h	
L15=L13+L14	Total Expected YEC Thermal Generation		16,250	MW.h	
L16=L15	Expected YEC Thermal Generation in Rates		16,250	MW.h	100% of long-term average
	Diesel		*3,000*	MW.h	Expected thermal less expected LNG.
	LNG		*13,250*	MW.h	90% of expected thermal, subject to not exceeding expected thermal less actual diesel.
L17=L7	Actual YEC Net Thermal Generation		4,000	MW.h	assumed net actual
	Diesel		*3,000*	MW.h	
	LNG		*1,000*	MW.h	
L18=L17-L16	YEC Thermal Generation to be included in LWRF	-	12,250	MW.h	
L18a	YEC Diesel Generation to be included in LWRF		-	MW.h	
L18b	YEC LNG Generation to be included in LWRF	-	12,250	MW.h	
L19=L1axL18a+L1bxL18b	Incremental YEC Thermal Generation Cost to Charge (Refund) LWRF ($000s)		($1,797)		

Year 3 - Actual Wind and Fish Lake Higher than Forecast; Actual Thermal Generation Below Expected

	Assumptions				
L2	YEC Grid load		436,600	MW.h	assumed actual
L3	Fish Lake		8,900	MW.h	assumed actual
L4=L2+L3	Total Grid load		445,500	MW.h	
	Assumed Actual Generation Sources				
L5	AEY Fish Lake		8,900	MW.h	assumed actual
L6	YEC Hydro		433,500	MW.h	assumed actual
L7	YEC Thermal (net of capital, insurance and maintenance)		3,100	MW.h	assumed actual
L7a	*YEC Diesel (net of capital, insurance and maintenance)*		*100*	*MW.h*	*assumed actual*
L7b	*YEC LNG (net of capital, insurance and maintenance)*		*3,000*	*MW.h*	*assumed actual*
L8	YEC Wind		-	MW.h	assumed actual
L9	Total Grid load		445,500	MW.h	
	Expected Generation Sources				
L10	AEY Fish Lake (expected)		8,730	MW.h	AEY Fish Lake long term average hydro generation based on YUB Order 2014-06.
L11	YEC Wind (expected)		-	MW.h	YEC 2017/18 GRA Compliance Filing
L12=L9-L10-L11	YEC Grid load net of expected Fish Lake and Wind		436,770	MW.h	
L13=L1d	LTA GRA Thermal Generation Forecast		14,000	MW.h	
L14=(L2-L1c)xL1e	LTA Thermal change due to YIS load change		7,470	MW.h	
L15=L13+L14	Total Expected YEC Thermal Generation		21,470	MW.h	
L16=L15	Expected YEC Thermal Generation in Rates		21,470	MW.h	100% of long-term average
	Diesel		*2,147*	MW.h	Expected thermal less expected LNG.
	LNG		*19,323*	MW.h	90% of expected thermal, subject to not exceeding expected thermal less actual diesel.
L17=L7	Actual YEC Net Thermal Generation		3,100	MW.h	assumed net actual
	Diesel		*100*	MW.h	
	LNG		*3,000*	MW.h	
L18=L17-L16	YEC Thermal Generation to be included in LWRF	-	18,370	MW.h	
L18a	YEC Diesel Generation to be included in LWRF	-	2,047	MW.h	
L18b	YEC LNG Generation to be included in LWRF	-	16,323	MW.h	
L19=L1axL18a+L1bxL18b	Incremental YEC Thermal Generation Cost to Charge (Refund) LWRF ($000s)		($2,933)		

Year 4 - Actual Wind and Fish Lake below Forecast; Actual Thermal Generation Above Expected

	Assumptions			
L2	YEC Grid load	448,600	MW.h	assumed actual
L3	Fish Lake	7,000	MW.h	assumed actual
L4=L2+L3	Total Grid load	455,600	MW.h	
	Assumed Actual Generation Sources			
L5	AEY Fish Lake	7,000	MW.h	assumed actual
L6	YEC Hydro	378,600	MW.h	assumed actual
L7	YEC Thermal (net of capital, insurance and maintenance)	70,000	MW.h	assumed actual
L7a	*YEC Diesel (net of capital, insurance and maintenance)*	*20,000*	*MW.h*	*assumed actual*
L7b	*YEC LNG (net of capital, insurance and maintenance)*	*50,000*	*MW.h*	*assumed actual*
L8	YEC Wind	-	MW.h	assumed actual
L9	Total Grid load	455,600	MW.h	
	Expected Generation Sources			
L10	AEY Fish Lake (expected)	8,730	MW.h	AEY Fish Lake long term average hydro generation based on YUB Order 2014-06.
L11	YEC Wind (expected)	-	MW.h	YEC 2017/18 GRA Compliance Filing
L12=L9-L10-L11	YEC Grid load net of expected Fish Lake and Wind	446,870	MW.h	
L13=L1d	LTA GRA Thermal Generation Forecast	14,000	MW.h	
L14=(L2-L1c)xL1e	LTA Thermal change due to YIS load change	12,870	MW.h	
L15=L13+L14	Total Expected YEC Thermal Generation	26,870	MW.h	
L16=L15	Expected YEC Thermal Generation in Rates	26,870	MW.h	100% of long-term average
	Diesel	*20,000*	MW.h	Expected thermal less expected LNG.
	LNG	*6,870*	MW.h	90% of expected thermal, subject to not exceeding expected thermal less actual diesel.
L17=L7	Actual YEC Net Thermal Generation	70,000	MW.h	assumed net actual
	Diesel	*20,000*	MW.h	
	LNG	*50,000*	MW.h	
L18=L17-L16	YEC Thermal Generation to be included in LWRF	43,130	MW.h	
L18a	YEC Diesel Generation to be included in LWRF	-	MW.h	
L18b	YEC LNG Generation to be included in LWRF	43,130	MW.h	
L19=L1axL18a+L1bxL18b	Incremental YEC Thermal Generation Cost to Charge (Refund) LWRF ($000s)	$6,326		

Year 5 - Actual Wind and Fish Lake at Forecast; Actual Thermal Generation Above Expected

	Assumptions				
L2	YEC Grid load		461,000	MW.h	assumed actual
L3	Fish Lake		8,730	MW.h	assumed actual
L4=L2+L3	Total Grid load		469,730	MW.h	
	Assumed Actual Generation Sources				
L5	AEY Fish Lake		8,730	MW.h	assumed actual
L6	YEC Hydro		356,000	MW.h	assumed actual
L7	YEC Thermal (net of capital, insurance and maintenance)		105,000	MW.h	assumed actual
L7a	*YEC Diesel (net of capital, insurance and maintenance)*		*40,000*	*MW.h*	*assumed actual*
L7b	*YEC LNG (net of capital, insurance and maintenance)*		*65,000*	*MW.h*	*assumed actual*
L8	YEC Wind		-	MW.h	assumed actual
L9	Total Grid load		469,730	MW.h	
	Expected Generation Sources				
L10	AEY Fish Lake (expected)		8,730	MW.h	AEY Fish Lake long term average hydro generation based on YUB Order 2014-06.
L11	YEC Wind (expected)		-	MW.h	YEC 2017/18 GRA Compliance Filing
L12=L9-L10-L11	YEC Grid load net of expected Fish Lake and Wind		461,000	MW.h	
L13=L1d	LTA GRA Thermal Generation Forecast		14,000	MW.h	
L14=(L2-L1c)xL1e	LTA Thermal change due to YIS load change		18,450	MW.h	
L15=L13+L14	Total Expected YEC Thermal Generation		32,450	MW.h	
L16=L15	Expected YEC Thermal Generation in Rates		32,450	MW.h	100% of long-term average
	Diesel		*40,000*	MW.h	Expected thermal less expected LNG.
	LNG	-	*7,550*	MW.h	90% of expected thermal, subject to not exceeding expected thermal less actual diesel.
L17=L7	Actual YEC Net Thermal Generation		105,000	MW.h	assumed net actual
	Diesel		*40,000*	MW.h	
	LNG		*65,000*	MW.h	
L18=L17-L16	YEC Thermal Generation to be included in LWRF		72,550	MW.h	
L18a	YEC Diesel Generation to be included in LWRF		-	MW.h	
L18b	YEC LNG Generation to be included in LWRF		72,550	MW.h	
L19=L1axL18a+L1bxL18b	Incremental YEC Thermal Generation Cost to Charge (Refund) LWRF ($000s)		$10,642		

TOPIC: **Fixed Change Factor**

REFERENCE: Table 2.1-3, Page 2.1-7, Year 4, L13
Table 3 in "LWRF and ERA for 2017 and 2018 ext.xlsx"

QUOTE:

PREAMBLE: AEY seeks clarification about the operation of the LWRF and the ERA.

QUESTION:

a) Is the Fixed Change Factor fixed? If so, is it fixed for a specific period?

b) Can the Fixed Change Factor change? If so, under what circumstances can the factor change?

c) Does the Fixed Change Factor apply to the ERA? If so, under what circumstances can the Fixed Change Factor change for the ERA?

d) Is the "Incremental thermal generation for incremental total generation (%)" the same as the Fixed Change Factor?

ANSWER:

(a) and (b)

The Fixed Change Factor would remain fixed until the next Yukon Energy General Rate Application unless an update is required to address material changes in LTA hydro system capability due to changes in loads, installed capacity licensing/ permits or other factors.[1] This is addressed in the LWRF Term Sheet (Compliance Filing, Appendix 2.1, Attachment 2.1-1, page 2.1-2). See also the response to YUB-YEC-1-15.

[1] Whether as part of a GRA or as a separate proceeding, the change in the Fixed Change Factor would be subject to review and approved by the YUB.

(c)

The Fixed Change Factor applies only to the determination of the LWRF and YEC's final thermal fuel costs for each fiscal year, and only affects the ERA to the extent it affects YEC's final year-end fuel costs and the resulting calculation of "incremental thermal generation for incremental total generation (%)" at line B8. As corrected in the response to AEY-YEC-1-3(b), line B8 simply reflects the Fixed Change Factor as used to determine the LWRF.

The portion of YEC's changes in thermal fuel cost that relates to wholesale load growth would be addressed through the ERA (according to the rules established for the ERA). The portion of the added thermal that relates to changes in water conditions would be addressed through the LWRF under the Compliance Filing proposals. Yukon Energy would be subject to all other load related risk.

(d)

As noted in the response to AEY-YEC-1-4 (a) and (b) there is an error in line L13 of Table 2.1-3 as it relates to Year 4 as presented on page 2.1-7 of Attachment 2.2-1.

The "incremental thermal generation for incremental total generation (%)" referenced in Table 3 in "LWRF and ERA for 2017 and 2018 ext.xlsx" simply reflects the 45.3% Fixed Change Factor as noted in the response to "c" above.

TOPIC: **LWRF for 2018**

REFERENCE: "320. However, the Board is of the view that the current DCF mechanism is complex and does not show the hydro generation and thermal generation in a given year **when actuals are determined because the actuals are based on modelled results**. The Board finds that a simpler mechanism for adjusting for variances between the approved forecast for hydro generation and thermal generation and actual hydro generation and thermal generation in a test year is needed. A deferral account is a rate adjustment mechanism aimed at reconciling forecasts with actuals for matters that are not in the control of the utility.

321. For these reasons, the Board directs YEC to create a deferral account that records the variance between actual thermal generation fuel costs (based on volume only) and the GRA forecast thermal generation fuel costs (based on volume only) that are due to changes in water conditions…" ***[emphasis added]***

- Board Order 2018-10

Tables 1 & 3 in "LWRF and ERA for 2017 and 2018 ext.xlsx"

Table 3.4-1 and Table 2.1-4 in Attachment 2.1-2

QUOTE:

PREAMBLE: AEY seeks clarification about operation of the LWRF.

QUESTION:

a) Please confirm YEC is forecasting 16,355MWh of Thermal Generation associated with a firm grid load forecast of 420,265MWh to be included in the rates for the 2018 test year. If not confirmed, please identify the MWh forecast by YEC for Thermal Generation.

b) Please explain how the 16,355MWh (or the revised number from part (a) if any) was determined. For example, is this amount determined using Table 2.1-4 from Attachment 2.1-2? If not confirmed, please explain.

c) Please confirm the percent of forecast fuel in rates for the 2018 test year is approximately 3.9% (or 16,355MWh thermal generation per 420,265MWh of grid load). If not confirmed, please explain.

d) Please confirm the percent of forecast fuel in rates changes from 3.9% to 45.3% for all grid load variance from the 420,265MWh forecast. If not confirmed, please explain.

e) Please confirm the following costs of fuel in rates changes from approximately $0.0063/kWh (from $0.1613/kWh * 3.9%) to approximately $0.0799/kWh (shown in Table 3, line B10).

f) Please confirm that the Fixed Change Factor is determined by using the estimated thermal generation requirements at +/-5GWh grid load increments as shown in Table 2.1-4 in Attachment 2.1-2. If not confirmed, please explain.

g) Please confirm the YUB has not approved Tables 3.4-1 or 2.1-4 in Attachment 2.1 2. If not confirmed, please explain.

h) Is YEC seeking YUB approval of Tables 3.4-1 or 2.1-4 in Attachment 2.1-2?

i) Please confirm the Thermal Generation requirements in Tables 3.4-1 and 2.1-4 are developed using forecasts from YEC's YECSIM. If not confirmed, please explain.

j) Please confirm YECSIM, and YEC's fuel forecasts, cannot be retroactively verified with actual grid metrics in part because the forecasts are derived using Long Term Average water levels as inputs. If not confirmed, please explain.

k) Please confirm total grid load includes all YEC's customers' loads (retail and industrial) and AEY's wholesale customers. If not confirmed, please explain.

l) Please explain how using "Expected YEC Thermal Generation in Rates" for an actual cost (L16, Table 1) reconciles with paragraph 320 from Board Order 2018-10. In particular, please discuss whether "actual costs" are still based on "modelled results" (via the Fixed Change Factor).

ANSWER:

(a)

Confirmed.

(b)

The LTA forecast thermal generation for the 2018 test year is determined based on Table 2.1-4.[1] Table 2.1-4 provides the Compliance Filing LTA hydro and thermal generation based on the same YECSIM water years and grid conditions as Table 3.4-1 in the Application, adjusted to reflect the major change in forecast seasonal shape of the Minto industrial load.

(c)

It is confirmed that 16,355 MWh is 3.9% of 420,265 MWh.

(d)

Confirmed as regards thermal share of load variances from the GRA forecast. As noted in response to part (c) the thermal generation is a 3.9% share of the 2018 generation forecast. The 45.3% Fixed Change Factor is used to determine the share of the change in generation from forecast that relates to thermal generation.

The following is noted (considering the example provided in Table 2.1-1 of Attachment 2.1-1, page 2.1-4):

- GRA Forecast Thermal Generation 16.36 MWh is 3.9% of 420,265 MWh of total YIS Forecast Firm Generation [net of Fish Lake and wind].

- The YIS load variance is 26.74 MWh (447,000 MWh minus 420,265 MWh).

- The 45.3% relates to the 26.74 MWh variance and is used to determine the share of the change in load that would be met with thermal generation under LTA

[1] As noted in Appendix 2.1, Attachment 2.1-2 at page 2.1-1.

water conditions. It is not applied (and does not relate to) the forecast YIS generation of 420,265 MWh or the actual YIS generation of 447,000. It is 45.3% of the incremental load of 26.74 MWh.

(e)

Not confirmed. The $0.0799/kWh as shown in Table 3, line B10 relates to the YEC thermal cost change, not to the total cost of fuel in rates.

(f)

Confirmed. Attachment 2.1-2, page 2.1-2 notes the Fixed Change Factor is determined as follows:

- Table 2.1-4 shows the change in forecast LTA thermal generation associated with 5 GWh changes in annual YIS load from the 420.27 GWh Compliance Filing Forecast.

- To simplify the LWRF determinations of LTA thermal generation at year end based on actual YIS load and water conditions Table 2.1-4 is used to determine Fixed Change Factor for LTA thermal generation specific to the 2018 GRA forecast by considering the following:

    - The expected thermal generation requirement for a 5 GWh increase in load (to 425.27 GWh); this results in LTA thermal generation of 18.73 GWh (2.38 GWh/ year or 47.6% of the change in load from GRA forecast).

    - The expected thermal generation requirement for a 5 GWh decrease in load (to 415.27 GWh); this results in LTA thermal generation of 14.20 GWh (2.15 GWh/year or 43.0% of the change in load).

- The Fixed Change Factor of 45.3% is based on the average of the 47.6% and 43.0% share of the +5 and -5 GWh change in YIS load.

(g)

Confirmed.

(h)

Yukon Energy is seeking approval of Table. 2.1-4 to the extent required to approve the 2018 GRA thermal generation forecast and the Fixed Change Factor.

(i)

LTA hydro and thermal generation forecasts included in Table 2.1-4 and included in the Compliance Filing were developed using the YECSIM model.

(j)

As summarized in the response to YUB-YEC-1-2, the LTA forecast derived using the YECSIM model is the most reasonable and accurate forecast for the 2018 test year.

YECSIM is designed to provide LTA estimates of hydro and thermal generation on a weekly time step basis, and to address on a consistent basis the range of known water conditions that have been recorded to date.[2] LTA hydro model estimates using any water model (including YECSIM) are not structured in a way that lends to retrospective verification per se. [This has been reviewed in exhaustive detail previously - see responses to YUB-YEC-1-3(c) from the 2014 DCF/ ERA Proceeding; Appendix 3.4 page 3.4-26 of the 2017/18 GRA; YUB-YEC-1-49 from the 2017/18 GRA; and AEY-YEC-1-1 from the ERA Part 1 Proceeding. See also the ERA Two Part Filing Section 1.4; and Appendix 2.4 which provided an overview of the YECSIM model and user manual and attached the YECSIM User Manual. The PPT presentation provided at the February 12, 2018 Workshop (YECSIM Model in GRA) also reviewed the context of YECSIM for the 2017/18 GRA, the fundamentals of the YECSIM User Manual, and application of YECSIM in the 2017/18 GRA].

During each GRA, the adoption of LTA estimates and the related LWRF Term Sheet Table will be subject to regulatory oversight regarding YECSIM model parameters and consistency with current known conditions. As such, whether or not YECSIM can be "retroactively verified" does not prevent the Board from providing regulatory oversight regarding Yukon Energy LTA thermal costs and subsequent ERA charges to AEY.

[2] Key features related specifically to YECSIM are reviewed at pages 3.4-25 to 3.4-29 of YEC's 2017-18 GRA.

(k)

Confirmed.

(l)

Please see detailed explanations outlined in response to YUB-YEC-1-13, YUB-YEC-1-14 and YUB-YEC-1-20. The LWRF as filed is based on directions in Appendix A for Board Order 2018-10.

City of Whitehorse
(CW)

TOPIC: **Wholesale Rate Forecast**

REFERENCE: Tab 7 Schedules comparisons – 2017 GRA Compliance Filing, Schedule 9
Tab 7 Schedules comparisons – 2018 GRA Compliance Filing, Schedule 9
Application Section 2.6.2, DF page 39

QUOTE:

PREAMBLE: For both 2017 and 2018 the forecast wholesale sales increases (19,426 MWh in 2017 and 5,181 MWh in 2018) yet the rate in cents per KWh remains constant at 8.3 cents per KWh.

QUESTION:

a) Please confirm that the rates cited in Tab 7, Schedules 9 for 2017 and 2018 are based on the forecast volumes and revenues provided in the initial application, and the rate will change on the final YEC rate schedule to reflect the larger forecast loads approved in Decision 2018-10, and result in a lower rate for wholesale sales for both years. If not confirmed, please fully explain, and fully explain why, in a GRA, if the forecast sales increase, the rate charged to customers does not decrease.

b) If (a) above is not confirmed, please provide the wholesale rate that was in existence prior to this GRA.

c) If (a) above is confirmed, please provide the final 2017 and 2018 wholesale rate that YEC will charge.

ANSWER:

(a)

Not confirmed. The implementation of Board directions related to forecast customer sales pursuant to Order 2018-10 will only change YEC's forecast sales (MWh) and revenues ($) from each customer class (including forecast sales and revenues from the wholesale customer), but will not result in a change to the wholesale rate (or any other customer

rates) outside of the implementation of an adjustment to the quantum of Rider J applicable to all YEC and AEY retail and industrial customers.

(b) and **(c)**

Per established practice in Yukon, the wholesale rate will not change as a result of a change in YEC's revenue requirement – but will only change as part of a Phase II rate proceeding.

The approved Rate Schedule 42 – Wholesale Primary (YEC) sets an energy charge for AEY of 8.298¢ per kW.h (plus the ERA provisions). This energy rate was approved in the 2009 Phase II rate application and there has been no application to change the rate since that time beyond recent changes related to the ERA provisions (i.e., it was the rate in existence prior to the 2017/18 GRA, is the wholesale rate today and will not change as a result of Yukon Energy's 2017/18 GRA).

TOPIC: **2017 Actual results**

REFERENCE: YEC Application, PDF page 21 of 145

QUOTE:

PREAMBLE: Throughout the Compliance filing, YEC indicates that it has updated 2017 based on actual results. On PDF page 21, YEC indicates it has used the 2017 actual results as reported in Undertaking 35. CW requires an understanding of what YEC actually has done.

QUESTION:

a) Please confirm that the 2017 actual results in undertaking 35 are the 2017 Actual results with no revision or adjustments. If not confirmed please provide the 2017 actual results with no revisions or adjustments and provide an explanation for each revision or adjustment.

b) Please provide when YEC expects to file its next Phase II application.

ANSWER:

(a)

The Compliance Filing uses 2017 actual results (consistent with undertaking 35) except for adjustments required to be made as per Board Order 2018-10. In this context, "actual" relates to actual regulatory filing results and ignores any differences between audited final financial results and final regulatory reporting results.

Adjustments from actual include the following:

- In order to determine revenue requirement and rate increase required to achieve an ROE of the approved 8.70%, YEC used the approved capital structure of 60% debt and 40% equity. YEC's actual 2017 capital structure was 58.2% debt and 41.8% equity. This also resulted in a difference to the Cost of Debt and Return on Equity. Cost of Debt is reported as 2.40% in the Compliance Filing but actual Cost

of Debt was 2.58%.[1] Return on Equity is reported as the approved 8.70% in the Compliance Filing but actual Return on Equity was 8.32%.

- Labour in the Compliance Filing is calculated using the average capital to maintenance allocation ratio based on the inclusion of the actual 2017 ratio, resulting in a ratio of 17%. The actual 2017 capital to maintenance ratio was 15%.[2]

(b)

Given OIC 2018/220 and the Board's prior direction in Order 2013-01 no Phase II proceeding is being contemplated by YEC at this time.

[1] Board Order 2018-10, paragraph 234 notes that actual debt for YEC for 2017, as reflected in Undertaking 35, are not accepted by the Board in the decision. Board Order 2018-10, paragraph 237 notes that "for the purposes of this decision, the Board accepts the forecast market rate for YEC's cost of debt of 2.15 per cent for each of the 2017 and 2018 test years." Implementation of this direction in relation to new debt in 2017 results in cost of debt reported as 2.40% in the Compliance Filing.

[2] The Compliance Filing labour cost for 2017 actual was adjusted to use the allocation to capital based on 2014-2017 averages. This was pursuant to direction provided in paragraph 130, Appendix A of Order 2018-10.

TOPIC: **O&M**

REFERENCE: Application Table 2-2

QUOTE:

PREAMBLE: The CW notes that total O&M in 2017 increases because the capital to maintenance ratio decreases.

QUESTION:

a) Please provide the capital to maintenance ratio and supporting calculations from the initial application.

b) Please fully explain why O&M should go up if capital work is lower. In the response please confirm that YEC does the required maintenance work on its system regardless of the level of capital and explain how a reduction in capital would cause an increase in maintenance work.

ANSWER:

(a)

The capital to maintenance ratio from the initial application is as follows:

	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Forecast
Capital	17%	17%	20%	16%	18%
Non-Capital	83%	83%	80%	84%	82%

(b)

YEC calculated a total labour cost based on a forecast employee complement of 93.70 FTE's. In Board Order 2018-10 the Board did not ask YEC to change the number of FTE's or the labour escalation, so the total labour cost was fixed. Total labour cost is split between capital labour and maintenance/admin labour. If the capital component of the ratio goes down, the maintenance component must go up for the ratio to equal 100%.

Yukon Utilities Board
(YUB)

TOPIC: **Non-test year risks**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application

QUOTE:

PREAMBLE:

QUESTION:

a) Please discuss in detail who (YEC or ratepayers) bears the risk of revenue requirement items during non-test years. If YEC is of the view that certain risks are borne by customers and other risks are borne by the utilities, then please distinguish who bears each risk and why.

ANSWER:

(a)

Unless otherwise specified in an approved deferred cost mechanism and/or a specific rate mechanism (e.g., ERA) that shifts cost variance to ratepayers or the wholesale utility (subject typically to a future YUB review), YEC bears the risk of revenue requirement items varying from approved GRA forecasts. This applies during non-test years as well as test years (as approved rates do not vary in non-test years from those last approved for a test year).

The definition of "bearing the risk" in this context is specifically about who has responsibility for a cost risk between GRA decisions of the Board, i.e., this automatically includes any non-test years that may occur between such GRA decisions. On cost risks borne by the utility (e.g., for load forecasts), each GRA re-opens the forecast and ability to adjust as needed (subject to YUB review and approval).

Approved deferred cost mechanisms that shift cost variance from approved GRA forecasts to ratepayers (typically subject to a future YUB review) currently exist for thermal fuel prices, impacts on thermal fuel generation costs due to water-related changes in hydro generation, RFID related costs for unexpected events or losses, and potentially other specific cost items as approved by the YUB from time to time. In accordance with normal

principles established in Canada for utilities, these deferred cost mechanisms apply during non-test years as well as test years. Specific to thermal generation variances, the response to Round 2 interrogatory YUB-YEC-2-1(d) provides a detailed risk-based justification for assigning thermal generation variances to ratepayers.

Table A2.1-1 below is excerpted from the Two Part ERA Application (April 6, 2018), and outlines the traditional diesel-related regulatory risk sharing relationships in Yukon. Table A2.1-1 outlines whether ratepayers or utilities bear certain risks, the rationale for this and how the risk is addressed or managed in the rate setting process. While Table A2.1-1 is focused on diesel-related regulatory risk – it captures the key principles for risk allocation and key relationships in this regard that apply for non-test years as well as for test years.

In summary – the following is specifically noted regarding risk allocation based on Table A2.1-1:

- **Ratepayers typically bear risks related to items that are determined to be beyond the utility's ability to reasonably forecast** and where there may be considerable variation from forecast (e.g., water variability; variability in thermal price; unexpected event or loss). In principle, ratepayers would bear the risk where actuals vary from approved forecasts for a test year and the risk that non-test year results will vary from approved forecasts for the last test year. However, in each of the specified cases there is a contingency mechanism in place to help smooth and mitigate over time rate impacts or rate instability for ratepayers due to variances from approved forecasts (e.g., the Diesel Fuel Price Variance Account; the Diesel Contingency Fund and the Reserve for Injuries and Damages).[1]

  Absent contingency mechanisms – in cases where thermal fuel price or water conditions varied significantly from forecast, the utility would need to seek adjustments in rates to address material changes in costs or revenues beyond its control. This would likely result in increased regulatory burden and increased rate instability as the utility would need to seek more frequent rate adjustments with potentially more extreme changes in rates.

[1] The Board reaffirms, for example, in paragraphs 318-319 of the Reasons for Decision in Order 2018-10 "that the risk of low water conditions, with respect to added costs for thermal generation, should be borne by the customers of the utility", and "finds that a DCF-type of mechanism is required" for YEC.

- **Utilities typically bear risks related to items that are considered reasonable for the utility to forecast** (e.g., sales volume, location of load/ line losses; and operation of the system). While not addressed in Table A2.1-1, the utility would also bear risks related to items included in its O&M and capital forecasts that are considered within its ability to reasonably forecast (e.g., labour, and non-labour items such as transmission, distribution, general O&M, administrative costs). In each case, where the item is within the utility's ability to reasonably forecast, the utility bears the risk where actuals vary from approved forecasts for a test year and the risk that non-test year results will vary from approved forecasts for the last test year.

Table A2.1-1: Traditional Diesel-Related Regulatory Risk Sharing Relationships in Yukon

	Factors that affect diesel generation requirements	Ability to Forecast	Who carries risk for forecast inaccuracy	How is Risk Addressed
1.	Fluctuation in diesel price from GRA forecast	Each utility provides a diesel price forecast for the test years; actual fuel prices may vary considerably from forecast due to volatile market conditions that are outside the utility's ability to forecast.	Ratepayers	Rider F and Diesel Fuel Price Variance Account (DFPVA)
2.	Availability of water and or/ wind	Each utility provides a forecast of expected LTA hydro generation; actual hydro generation may vary considerably from forecast depending on water availability in a given year.	Ratepayers	Diesel Contingency Fund
3.	Volume of interconnected grid sales	Each utility forecasts the volume of sales in GRA test years.	Utilities	Utility forecast risk
4.	Location of load (line losses)	Each utility provides forecast of line losses in test years.	Utilities	Utility forecast risk
5.	Operation of system	Each utility provides sales and generation forecasts based on its knowledge regarding how the system is expected to operate.	Utilities	Utility forecast risk
6.	Unexpected event/ loss	Not forecastable.	Ratepayers	Reserve for injuries and damages (RFID) and insurance.

TOPIC: **GRA forecasts – generation**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, page 2-4; Appendix A to Board Order 2018-10, paragraph 77

QUOTE: In response, YEC in this GRA filing for 2018 and in future GRA filings will not use ST hydro generation forecasts, and (b) will continue to use LTA hydro and thermal generation forecasts (plus separate forecasts for thermal maintenance costs). The 2018 LTA hydro and thermal generation forecasts reflect the LTA forecast used in Table 3.4-1 of the GRA Application adjusted as required to address the major change in forecast seasonal shape of the Minto industrial load, i.e., the adjusted Minto load forecast for 2018 falls sharply at about mid-year for the balance of the year (versus being reasonably flat throughout the year in the Application forecast). The LTA determinations for 2018 are reviewed in more detail in Appendix 2.2, of this Compliance Filing. (Compliance filing, page 2-4)

77. Given the above-noted advantages and disadvantages of LTA and ST hydro generation forecasts, the Board finds that, for purposes of this proceeding, it will not use the ST forecast for forecasting levels of hydro electric generation and thermal generation nor direct its use for future GRAs. In determining the revenue requirements for these and future test years, the Board is focusing on the reasonableness of the forecasts and forecasting accuracy. Further, the onus is on YEC to adequately explain any variance between actual results and its forecast amounts. For these reasons, the Board directs YEC in future GRA filings, to show actual hydro and thermal generation results when comparing previous and forecast test years. (Appendix A to Board Order 2018-10, paragraph 77, Direction 7)

PREAMBLE:

QUESTION:

a) Please confirm that, based on the above direction of the Board, YEC's 2018 forecast for generation (both hydro and thermal) is the most reasonable and

accurate forecast to use in the Board's determinations of the 2018 amounts. If not confirmed, please explain why confirmation cannot be given.

b) Similarly, for Directions 9 (paragraph 100) and 10 (paragraph 102), please confirm that the 2018 forecast in response to those directions is the most reasonable and accurate forecast to use in the Board's determinations of the 2018 amounts. If not confirmed, please explain why confirmation cannot be given.

ANSWER:

(a) and **(b)**

Confirmed.

In the context of this proceeding, the "reasonableness and accuracy" of the 2018 test year generation forecast must be assessed in the context of the Board's directions and findings for the 2018 test year load forecast and any other related matters.

Bearing in mind that context, the hydro and thermal generation forecast provided in the Compliance Filing, including the fuel cost and fuel mix forecasts, is the most reasonable and accurate forecast for the 2018 test year of LTA hydro generation and related thermal generation to use in the Board's determinations of the 2018 amounts.

This forecast is aligned with the following key findings of the Board regarding 2018 test year forecasts, as outlined in Appendix A to Order 2018-10.

- **The short term (ST) forecast should <u>not</u> be used for forecasting levels of hydroelectric generation and thermal generation for the 2017/18 GRA proceeding or for future GRAs (para 77).** Therefore, a long-term average approach to forecasting for the 2018 hydro and thermal generation needs to be used.

- **Order 2018-10 specifically approved the sales or load forecasts that are the key input to the generation forecasts.** Unlike the direction to use actual load and generation for the 2017 test year, a wholesale forecast load for 2018 was directed to be used based on the AEY approved compliance filing forecast (para 38); the

major industrial sales forecast for 2018 was directed to be the updated 2018 Minto sales forecast indicated in the undertaking (para 46) wherein the adjusted Minto load forecast for 2018 falls sharply at about mid-year for the balance of the year (versus being reasonably flat throughout the year in the Application forecast); and YEC's firm retail sales forecast for 2018 as provided in the application was approved (para 51). The Compliance Filing addressed and met each of these requirements for the 2018 sales and generation load forecast, and this load forecast provided the basis for the 2018 hydro and thermal generation forecasts mentioned above.

- **Order 2018-10 specifically approves all relevant components of thermal generation cost.** YEC was directed for the 2018 test period to use the fuel costs related to YEC's forecast for 2018 (para 100), to use forecast cost and efficiency parameters for thermal generation as approved (para 101), and to state which fuel mix it is using for its 2018 forecast (para 102).

The hydro and thermal generation forecasts for 2018 included in the Compliance Filing adhere to the above directions. Based on these directions and the resulting 2018 generation load forecast, the hydro and thermal generation forecasts for 2018 included in the Compliance Filing are the most reasonable and accurate forecasts available for the 2018 test year for the following reasons:

1. **Short Term v. Long Term methods** - In the 2017/18 GRA proceeding there were two hydro and diesel generation forecast methods that were subject to review and testing: the ST forecast and the LTA forecast. No other hydro or thermal generation forecasts or methods were provided or tested as part of the proceeding. Yukon Energy in the proceeding documented its material concerns with the use of the ST forecast for determining hydro and thermal generation requirements in the test years. As noted above, the Board also determined that ST forecasts should not be used for determining hydro and thermal generation requirements for the 2017/18 GRA or for future GRAs. In context, based on forecast methods reviewed and tested by the Board and intervenors in this proceeding, this leaves the 2018 LTA forecast based on the approved load forecast as the only reasonable and accurate forecast for determining hydro and thermal generation requirements for the 2018 test year.

2. **Long Term Model** - This LTA forecast based on YECSIM model assessments as reviewed in the proceeding is the most reasonable and accurate LTA forecast available for use at this time. The LTA forecast is determined based on 35 years of water record data, current renewable generation capacity and water licences, and a model that provides the most reasonable and accurate available representation of the YEC power system LTA hydro generation for any forecast load under the known range of hydrological conditions. The reasonableness and accuracy of individual components of the model, such as energy generation for given flows and heads, has been verified individually. These are known to be reasonable and accurate representations of the real phenomenon. Model inputs such as spillway discharge rating curves have been based on, and verified with, actual data. See also response to AEY-YEC-1-6(j). Finally, the LTA hydro and thermal generation forecast for 2018 was adjusted to reflect the material change in seasonal load shape for the updated Minto seasonal sales forecast load (see Attachment 2.1-2 of the Compliance Filing), thereby ensuring that the 2018 LTA hydro and thermal forecast would reasonably and accurately reflect the updated 2018 generation load forecast.

3. **Fuel Mix** - The LNG: diesel fuel mix ratio of 90% LNG and 10% diesel as used for the 2018 forecast is stated as required by Appendix A to Order 2018-10 (para 102), and is also considered the most reasonable and accurate forecast for the 2018 test year. As reviewed in the 2017/18 GRA application[1] and interrogatory responses[2] the 90:10 ratio reflects experience and expectations related to thermal generation to supply the forecast LTA requirements over all water years, and is proposed to ensure that revenue requirement costs recognize current limits on actual LNG ability to displace all diesel generation.

[1] See Application page 3, 26, footnote 7; Appendix 3.4, page 3.4-8; Appendix 3.4, page 3.4-14.
[2] See YUB-YEC-1-25; JM-YEC-1-13; YUB-YEC-1-42; YUB-YEC-1-43; YUB-YEC-1-36; YUB-YEC-139; YUB-YEC-2-6; YUB-YEC-2-19; YUB-YEC-2-20; YUB-YEC-2-21; YUB-YEC-2-22; JM-YEC-2-4 and UCG-YEC-2-18.

TOPIC: **Fuel mix forecast**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, page 2-15 to 2-16; Appendix A to Board Order 2018-10, paragraph 293

QUOTE: In response to Directive #26, YEC has reviewed the DFPVA monthly adjustment mechanism to assess what options may exist to reflect forecast versus actual thermal fuel mixture for LNG and diesel fuel. This matter was not addressed during the proceeding, and was not part of YEC's commitment (subject to what is feasible with the DCF/LWRF year-end adjustment mechanism) to assume risks related to actual fuel mix at forecast fuel prices in the determination of final annual DCF (now LWRF) transfers. (Compliance filing, pages 2-15 to 2-16)

293. Lastly, YEC has stated it will assume all risk with respect to the thermal fuel mixture (LNG versus diesel). Therefore, the Board directs YEC to ensure that any variances due to changes in the thermal fuel mixture (forecast versus actual) are not included in the DFPVA. YEC is to indicate, in its compliance filing to this application, the steps it will take to prevent changes in the thermal fuel mixture from appearing in the DFPVA. (Appendix A to Board Order 2018-10, paragraph 293)

PREAMBLE:

QUESTION:

a) Please explain what YEC means when it stated it will "… assume all risk with respect to the thermal fuel mix (LNG versus diesel)."

b) YEC stated that the matter regarding the thermal fuel mix was not addressed during the proceeding. The thermal fuel mix was discussed during the hearing and in information requests (for example, YUB-YEC-1-25 and transcript Volume 3 starting at page 581), but how variances would be accounted for was not examined. How does YEC propose to account for variances from the forecast thermal fuel mix given that material difference in

prices between the two types of fuels as well as any deviation in the fuel mix ratio affects the volume forecast for each fuel?

c) Please explain how YEC's response in part (b) supports the approvals requested by YEC in its compliance filing.

ANSWER:

(a)

The discussion surrounding paragraph 293 of Board Order 2018-10 is focused on proposed adjustments to the Diesel Fuel Price Variance Account (DFPVA) and Rider F to incorporate LNG price variances; the thermal mix discussion does not relate to DFPVA or Rider F.

The sole purpose of the DFPVA is to account for the differences in price between the forecast fuel prices and the actual fuel prices for each fuel.

In the 2017/18 GRA, Yukon Energy did not indicate that in relation to the fuel price variances addressed through Rider F and the DFPVA that it would "assume all risk with respect to the thermal fuel mix (LNG versus diesel)" as stated in question (a) above. The statement provided in paragraph 293 is not a direct quotation of a YEC statement, and no reference is provided in this paragraph to YEC evidence where this statement is made.

In evidence provided during the 2017/18 GRA, Yukon Energy noted that it would bear "the full risk of higher costs due to final diesel share [after DCF determinations] exceeding the 10% assumed in the GRA forecast."[1] This statement was made specifically in reference to transfers into and out of the DCF related to LTA hydro and thermal generation and in no way affects the DFPVA or Rider F. Further, all references in the 2017/18 GRA proceeding related to fixing the LNG:Diesel fuel mix ratio relate to transfers into and out of the DCF related to LTA hydro and thermal generation. This premise was never

[1] YUB-YEC-2-6. This response notes that the proposed approach would not allow the LNG share of any transfer into or out of the DCF to exceed 100%, and as a result under certain factual situations the final fuel mix of the DCF Transfer would be 100% LNG and the expected overall generation mix after the DCF transfer will not equal the 90/10 LNG/diesel fuel mix assumed for the Application. YEC noted under this situation, "YEC bears the full risk of higher costs duel to final diesel share [after DCF determinations] exceeding the 10% assumed in the GRA forecast." See also response to YUB-YEC-1-25(a).

discussed, or considered by YEC, in relation to the DFPVA or Rider F mechanism – and it was not addressed in any of the proceeding evidence relating to the DFPVA or Rider F mechanism.[2]

(b)

The following response addresses first the fuel mix evidence in the proceeding as referenced in the question, and then addresses the question as to how YEC proposes to account for variances from the forecast thermal fuel mix given that material difference in prices between the two types of fuels as well as any deviation in the fuel mix ratio affects the volume forecast for each fuel.

Fuel Mix Evidence during the Proceeding

As noted in part (a) above – during the 2017/18 GRA the LNG/Diesel fuel mix was discussed entirely in relation to the DCF Transfer. YEC's GRA application did not seek specific approval of the LNG/Diesel fuel mix in relation to Rider F. All interrogatory responses or other testimony regarding the LNG: Diesel Fuel mix, including the IR and transcript evidence referenced in this question, were focused on implementation of the DCF and the DCF Transfer using either LTA or ST hydro generation forecasts.

The Compliance Filing includes a proposal, consistent with the GRA Application and YEC's evidence during the proceeding, to account for variances from the forecast thermal fuel mix when determining year-end transfers in or out of the LWRF.[3] This proposal addresses the material difference in forecast prices between the two types of fuels, and how any deviation in the fuel mix ratio affects the overall fuel cost forecast at LTA hydro generation. The proposal ensures that, starting with fiscal year 2018, costs for YEC thermal generation savings (excess) for the LWRF are calculated so that YEC's final fiscal year expense for the total expected thermal generation (i.e., YEC expense after all transfers) is 90% LNG and 10% diesel, subject to the constraint that the LNG share of any transfer into or out of the LWRF cannot exceed 100%. To the extent that the actual

[2] Section 3.6.1 of the 2017/18 GRA addresses Rider F. None of the requested approvals reference the 90/10 LNG/Diesel fuel mix. YEC specifically requested approval to defer to the Diesel Fuel Price Variance Account (DFPVA) the variance (plus or minus) in the actual delivered cost of LNG compared to the delivered cost of LNG included in the most recent General Rate Application.

[3] See LWRF Term Sheet (Appendix 2.1, Attachment 2.1.1), in section titles "LWRF Thermal Savings (Costs)" and the example in Table 2.1-1 and Table 2.1-2.

outcome is not equal to the 90:10 ratio, as reviewed in the response to YUB-YEC-1-12(b), this LWRF fuel mix mechanism has YEC assuming the costs for any risk that actual overall diesel share as at year end (i.e., after LWRF determinations) may exceed 10%, and thereby increase YEC's average costs for its expected LTA thermal generation.

Yukon Energy's proposal in the GRA Application for adjusting the DFPVA to include LNG fuel prices (section 3.6.1 of Application) assumed that diesel fuel prices would continue to be addressed in the same manner as they are currently addressed (i.e., based on actual thermal generation requirements for that fuel), and that deferral of changes in actual versus GRA forecast LNG fuel prices would similarly be based on the actual thermal generation requirements for that fuel. Yukon Energy did not consider implementation of any other LNG/diesel fuel mix concept in relation to Rider F prior to the issuance of Board Order 2018-10 which included Directive #26.

Proposed Fuel Price Approach for DFPVA

Yukon Energy proposes that the DFPVA deferral of changes in actual versus GRA forecast fuel prices be based on the actual thermal generation requirements for each fuel.

This approach ensures that changes in actual versus GRA forecast fuel prices are directly addressed for each kWh of actual diesel and LNG generation. The result is therefore consistent with the purpose of the DFPVA, which is to address changes in actual versus forecast prices for each fuel as and when the fuel is used for actual thermal generation.

(c)

Yukon Energy is seeking approval for the inclusion of LNG fuel price as well as diesel fuel price variances in the DFPVA as of January 1, 2017, with each fuel price variance to be determined as and when the fuel is used for actual thermal generation.

The response to part (b) confirms that the approval sought is consistent with Yukon Energy's Application and evidence during the proceeding, and is consistent with the purpose of the DFPVA, i.e., to address changes in actual versus forecast prices for each fuel as and when the fuel is used for actual thermal generation.

For DFPVA purposes, the only requirement is to address variance in prices for each fuel at the time the fuel is actually used. Any issues about the actual mix of these fuels versus

the forecast mix has no bearing on reasonable and accurate accounting for the actual versus forecast variances in price for each fuel. Variance in forecast versus actual fuel mix is only relevant in the context of LTA thermal generation, and is addressed in Yukon Energy's proposals solely through the LWRF deferral account mechanism.

In the Compliance Filing, Yukon Energy reviewed Directive #26, and considered the requirements to ensure that any variances due to changes in the thermal fuel mixture (forecast versus actual) are not included in the DFPVA. Yukon Energy's proposed approach ensures that variances due to changes in thermal fuel mix (forecast versus actual) do not affect the DFPVA. However, Yukon Energy also examined the implications of an alternative approach where DFPVA accounting might have to retain the forecast fuel mix.

Pages 2-15 to 2-17 of the Compliance Filing outline YEC's assessment of the issues and concerns raised by Directive #26 if the GRA forecast fuel mix had to be retained. YEC's recommendation was that the DFPVA be determined for LNG as well as diesel based on actual fuel volumes used for generation (i.e., actual fuel mix) rather than the LTA thermal generation forecast fuel mix to retain consistency with current DFPVA principles and to avoid potential conflicts with the LWRF risk assignments and other complexities that may arise. The following were noted:

- The DFPVA addresses the variance each month between forecast and actual fuel price at forecast fuel efficiency, based on actual thermal generation, and ensures that any net variance in actual versus forecast fuel price related to actual thermal generation is solely to the cost or credit of ratepayers. To retain consistency with these principles, diesel and LNG fuel price variances need to be applied separately to actual diesel and actual LNG thermal generation volumes. In this manner, actual variances in fuel price (actual versus forecast for each fuel) will continue to be consistently addressed at the time of fuel use for actual generation.

- Taking into account actual prices in LNG and diesel – fuel mix is not an issue. It is simply a price issue. The DFPVA flows fuel price on fuel actually used and this approach needs to be consistent with LNG and diesel.

- Implementing Directive #26 so as to retain the forecast fuel mix would create new and added complexities:

- This approach would require that all actual thermal generation be assumed at the LTA thermal fuel mixture approved for the GRA, i.e., the 90/10 LNG/diesel mix assumed for 2018 in the Compliance Filing, and that DFPVA fuel price variance be determined for each month based on the forecast LTA blended fuel price at this mix versus the actual fuel price at this mix.

- As reviewed in the Compliance Filing at pages 2-16 to 2-17 (including Table 2-10 with the 2018 example), the result would create a new variance affecting fuel price differences from forecast reflecting the impact of the fuel mix variance from forecast.[4]

- The evidence during the proceeding also indicated that the LTA fuel mix forecast is not intended to apply to short-term or actual fuel use under widely varying water conditions and loads.

- Further, unlike the LWRF (or DCF) annual determination, the DFPVA determinations must be made on a monthly basis. As reviewed in the Compliance Filing at page 2-17, additional practical implementation issues arise when confronted with months where there is no actual use or actual price for LNG.

[4] The specific 2018 example indicated a slight increase of $43k in the cost risk to customers at the 90/10 fuel mix versus the actual 80.7% LNG and 19.3% diesel fuel mix. This outcome differs from the decrease in customer costs with use of the LTA 90:10 forecast fuel mix and forecast fuel prices with the LWRF year-end assessment in Appendix 2.1, Attachment 2.1-3 of the Compliance Filing.

TOPIC: **Details of Table 10 from Appendix A to Board Order 2018-10**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application

QUOTE:

PREAMBLE:

QUESTION:

a) Please revise Table 10, as referenced above, to reflect YEC's 2017-18 GRA Compliance Filing revenue requirement for non-fuel operating and maintenance expenses, including all line item details for the year 2017.

ANSWER:

(a)

Please see Table 1 below that includes the 2017 actual column included in the Compliance Filing.

Table 1: Non-Fuel Operating and Maintenance Expenses

	2013 GRA compliance	Actual 2013	Actual 2014	Actual 2015	Actual 2016	2017 Actual in Compliance Filing *	Forecast 2017 (Original Filing)	Forecast 2018 (Compliance Filing)
Labour	$ 9,348	$ 10,604	$ 11,172	$ 11,068	$ 11,739	$ 11,869	$ 11,770	$ 11,932
Production	1,437	1,639	1,795	1,595	1,906	2,190	1,750	1,799
Transmission	853	1,266	594	680	709	1,448	1,417	1,419
Distribution	226	322	553	541	284	571	530	535
General O&M	1,154	1,224	1,321	1,382	1,156	1,306	1,238	1,219
Administration	3,646	2,778	2,947	2,585	2,726	2,864	3,149	3,001
Insurance and Reserve for Injuries/Damages	1,121	1,216	1,243	1,256	1,263	1,511	1,510	1,510
Property Taxes	326	331	331	473	686	693	696	708
Total OM&A (Tab 7, Schedule 10)	$ 18,111	$ 19,381	$ 19,957	$ 19,580	$ 20,470	$ 22,452	$ 22,060	$ 22,125

Please note that the actual labour cost for 2017 was $11.893 million. The Compliance Filing labour cost for 2017 actual was adjusted to use the allocation to capital based on 2014-2017 averages to get the labour cost of $11.869 million as shown in Table 1. This was pursuant to direction provided in paragraph 130, Appendix A of Order 2018-10.

TOPIC: **Variance explanation for Other Non-labour costs**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, response to Direction 17, page 2-9, PDF page 29

QUOTE: 161. YEC is directed to provide this detail by way of updating the information found in tables 13, 14 and 15 for 2017 actual transmission and distribution results in its compliance filing to this decision and to explain any variances as directed by the Board in paragraph 89. YEC is also directed to provide in its compliance filing the Actual 2017 closing balance of its Deferred Vegetation Management account and to clarify whether YEC deferred any 2017 actual costs in excess of $0.502 million. (Appendix A to Board Order 2018-10, paragraph 161)

PREAMBLE: The Board is unable to confirm YEC's compliance with Direction 17.

QUESTION:

a) Please provide the 2017 variance explanations for the Other Non-Labour costs line item for Transmission costs ($80,000) and Distribution costs ($25,000).

b) Please clarify whether YEC deferred any 2017 actual costs in excess of $0.502 million to future years.

ANSWER:

(a)

The budgets for Other Non-Labour costs are forecast based on prior experience regarding annual requirements. As such, specific variances in 2017 mainly relate to unexpected expenditures that occurred in the year.

- The variance of $80,000 in non-labour transmission costs reflects additional transmission work exceeding $100,000 for implementation of cables to emergency mobile diesel installation in Whitehorse parking lot. Mobile diesel rentals were not forecast in the original GRA application.

- The Other Non-Labour Distribution budget consists of a variety of maintenance activities including but not limited to meter replacements, structure repairs, tools, snow removal, distribution substation and line maintenance and other required general repairs or maintenance. There was no significant individual item that caused the actual costs to be $25,000 greater than GRA forecast; it was an accumulation of many items.

(b)

YEC did not defer any 2017 actual brushing costs in excess of $0.502 million to future years.

TOPIC: **Variance explanation for Administration – fish hatchery**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, response to Direction 19, Page 2-11 to 2-12 including Table 2-9, PDF pages 31-32

QUOTE:

PREAMBLE: In Appendix A to Board Order 2018-10, the Board accepted YEC's actual 2017 administration costs. Notwithstanding, the Board is interested in the reason for the increase in actual fish hatchery costs between the years 2016 ($157,000) and 2017 ($183,000) as indicated on Table 2-9.

QUESTION:

a) Please clarify the reasons for the increase between 2016 and 2017 actual fish hatchery costs as noted in the preamble to this question.

ANSWER:

(a)

YEC hires a contractor to perform all operational work at the Fish Hatchery. All costs are contractor costs. The increase from 2016 to 2017 resulted from increased Professional and Staff cost (labour) by the Contractor. This coincided with a new agreement with the Contractor effective for 2017.

YEC has a cost sharing agreement with the Yukon Government (YG) where YG provides funding to YEC for reimbursement of certain Fish Hatchery costs. YG reimburses a fixed amount each year. YEC can request additional funding from YG if YG's portion of the split costs is less than 50%. YEC requested additional funding in 2017 but YG denied YEC's request. However, in May 2018 YEC negotiated an increase to the fixed portion of the funding agreement.

TOPIC: **Additions and removals from rate base**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, Table 1.1-3

QUOTE:

PREAMBLE:

QUESTION:

a) Please confirm that negative values in Table 1.1-3 equate to removals from rate base and positive values equate to additions to rate base. If not confirmed, please explain.

b) Please explain why the values under the heading "Disallowed assets [reflects closed projects]" are positive.

c) Please provide an explanation for the 2017 actual update lines in Table 1.1-3 for 2017 that includes an explanation of how the values were derived and what projects were included in those values.

ANSWER:

(a) and (b)

Table 1.1-3 includes various accounts affecting rate base, including some amounts (i.e., “Disallowed assets [reflects closed projects]”) that show positive before being added together and then deducted from rate base.

YEC confirms that the negative final rate base numbers in “Adjustments” columns in Table 1.1-3 for 2017 and 2018 reflect reductions in the test year forecast of rate base in the Compliance Filing compared to the Original Filing; positive final rate base numbers reflect increase in forecasts.

In order to improve the presentation in the table, YEC has modified Table 1.1-3 with added reference line numbering to more fully explain when calculations are being made as well as additional rows to better show how the numbers were derived (e.g., lines 57 and 58).

Please see YUB-YEC-1-7 Attachment 1 in MS excel format. There is no impact to the final rate base calculation from this modification to the table.

The table shows deductions from the rate base as a positive value, however, the formula for calculations of the rate base removes the deductions from the rate base. For example, accumulated amortization (line 11), construction-in-progress (line 14), disallowed assets (line 20) and miscellaneous reserves (line 25) are shown as positive numbers, however, these are deducted from the Property, Plant and Equipment for computation of the rate base (please see lines 27 that summarizes deductions in PP&E, and line 42 that shows removal of deductions in PP&E from rate base).

(c)

The numbers in the 2017 actual update lines represent the changes due to update from 2017 forecast included in the original GRA filing to the 2017 actuals as directed by the Board. This includes lower or higher actual spending compared to the forecast included in the original application as well as updates for disposal and other adjustments. Table 1 provides details of the lines for 2017 actual updates included in Table 1.1-3.

Table 1: Details of the 2017 Actual Updates Lines included in Table 1.1-3.

YUB-YEC-1-7 Attachment 1 Line Reference	Projects	2017 Test Year, $000		
		2017 Original Forecast	2017 Actuals	Difference
	PP&E 2017 Actuals Update			
	Hydro Unit #WH4 Overhaul	3,700	2,851	-849
	LNG Third Engine	3,040	2,675	-365
	AH Elevator Shaft Structural Steel Rehabilitation	1,593	1,755	163
	Aishihik Electrical & Control Upgrades	1,284	1,289	5
	WAF Transmission Upgrades	850	856	6
	Customer Extensions	475	699	224
	L170 Line access	350	439	89
	Dawson Derrick Digger	350	361	11
	Vehicle Purchases	250	192	-58
	Whitehorse Hydro Local HMI/Historian Upgrade	180	182	2
	Communications Upgrade	135	96	-39
	Canyon Lake Control Structure & Dyke Refurbishment	125	146	21
	S150 - Whitehorse Main RTU Upgrade	125	147	22
	Wareham Dam Blackstart Generator	120	0	-120
	Whitehorse Wind 1 Decommission	112	0	-112
	T&D - Breaker Replacements	100	111	11
	Transmission System Protection Settings	100	252	152
	Critical Spares - System Requirement	100	88	-12
	Other projects under $100K	1,617	1,456	-161
	Disposals		-429	-429
Line 4	**Total 2017 Actuals Update line**			**-1,440**
	Accumulated Amortization 2017 Actuals Update [incl. impact of Reserve for Site Restoration]			
	Depreciation Expense	12,217	12,323	107
	Disposals		-377	-377
	Balance of Reserve for Site Restoration	4,247	4,303	56
Line 13	**Total 2017 Actuals Update line**			**-213**
	Miscellaneous reserves			
	Reserve for Injures and Damages (includes impact of transfer from PP&E as noted in Table 1.1-3)	-847	-1,247	-399
	Other reserves [fire insurance, etc.]	4,966	4,966	0
Line 26	**Total 2017 Actuals Update line**			**-399**
	Deferred study costs - ending balances			
	Feasibility & Relicensing	25,817	25,102	-715
	Including impact from update to use 2017 actual spending for:			
	Aishihik Relicensing (remains in WIP)	1,450	1,969	519
	Thermal Plant (remains in WIP)	750	5	-745
	Battery (remains in WIP)	500	15	-485
	Detailed Line Inspection	378	181	-197
	Marsh Lake Storage (remains in WIP)	250	287	37
	Aishihik Remediation Work	250	0	-250
	Development of Asset Management Program	200	418	218
	2016 Resource Plan	150	161	11
	Mayo Lake Project (remains in WIP)	100	109	9
	Mt Sumanik Wind Feasibility Study (remains in WIP)	50	78	28
	Other			141
	Dam Safety Review - ending balances	118	118	0
	Deferred Vegetation Management - ending balances	1,994	1,994	0
	Total Impact of 2017 Actuals			**-715**
	Less shown as separate line items in Table 1.1-3			
Line 29	Disallowed - Time-of-use rate structure and smart grid [§519]			-100
Line 31	Mayo and Aishihik Climate Change Study [§516]			-160
Line 37	**Total 2017 Actuals Update line**			**-456**

Table 1.1 -3. Adjustments to the Ratebase [detailed]

Line No	in $000	2017/18 GRA Application		YUB 2018-10 Compliance Filing		Adjustments	
		2017	2018	2017	2018	2017	2018
	Calculation of Rate Base						
	Property, Plant and Equipment						
1	**PP&E Year-end balance**	**603,879**	**618,511**	**598,756**	**612,435**	**-5,123**	**-6,076**
2	*Transfers to RFID*					*-170*	*-170*
3	*Transfers to Deferred [Intangible assets as per auditor]*					*-3,513*	*-3,513*
4	*2017 Actuals Update*					*-1,440*	*-1,440*
	Disallowed Spending:						
5	*Stewart-Minto local SCADA [§446]*						*-165*
6	*Callison voltage regulator automation [§442]*						*-115*
7	*Dawson P158 T1/T2 transformer [§435]*						*-200*
8	*Aishihik control structure refurbishment [§426]*						*-325*
9	*Removed - Faro diesel building ventilation [§428]*						*-100*
10	*Other adjustments*						*-48*
	PP&E Deductions						
11	Accumulated Amortization	156,806	169,223	155,162	167,191	-1,644	-2,032
12	*Transfers to Deferred*					*-1,431*	*-1,431*
13	*2017 Actuals Update and Other Adjustments to PP&E noted above*					*-213*	*-601*
14	Construction-in-progress	4,358	8,274	4,776	7,620	418	-654
15	*AH3 control system drawings update [§374]*						*25*
16	*Aishihik control structure refurbishment [§426]*						*-325*
17	*Updates for 2017 actuals; for example:*					*418*	*-354*
18	*AH3 Lifting Device [GRA forecast was to close in 2017]*					*240*	
19	*LNG Third Engine lower spending*						*-365*
20	Disallowed assets [reflects closed projects]	691	691	2,746	2,746	2,055	2,055
21	*Disallowed - Aishihik elevator shaft steel rehabilitation project [§369]*					*200*	*200*
22	*Disallowed - AH reactor cable replacement [§373] - the actual spending at $37,989 [forecast spending was at $75,000].*					*38*	*38*
23	*DSM (§478-481) - reflects spending after 2015 and spending for programs not approved by the YUB*					*1,595*	*1,595*
24	*Gladstone [§497] - reflects cost after September 2014*					*221*	*221*
25	Miscellaneous reserves	4,119	4,069	3,719	3,669	-399	-399
26	*2017 Actuals Update for RFID [including transfer from PP&E noted above]*					*-399*	*-399*
27=11+14+20+25	**Total PP&E Deductions**	**165,974**	**182,257**	**166,403**	**181,227**	**429**	**-1,030**
	Deferred Study Costs						
28	Deferred study costs	29,346	44,917	29,038	41,695	-309	-3,222
29	*Disallowed - Time-of-use rate structure and smart grid [§519]*					*-100*	*-100*
30	*Disallowed - Northern Diesel Plan Relocation Study [§525]*						*-100*
31	*Mayo and Aishihik Climate Change Study [§516]*					*-160*	*-320*
32	*Whitehorse Hydro Uprate [§527]*						*-450*
33	*Small Hydro [§529]*						*-625*
34	*DSM (Paragraphs 478-481) - please see below Rate Case costs*					*-1,455*	*-1,921*
35	*Transfers from PP&E and Regulatory [Intangible assets as per auditor]*					*1,859*	*1,470*
36	*Hearing Reserve Updates - please see below Rate Case costs*					*3*	*-660*
37	*2017 Actual Updates*					*-456*	*-456*
	Deferred Study Costs Deductions						
38	*Studies in Progress [reflect above changes]*	*16,167*	*29,859*	*14,964*	*29,498*	*-1,203*	*-361*
39=28-38	**Net Deferred Study Costs**	**13,179**	**15,058**	**14,074**	**12,198**	**894**	**-2,861**
	Accumulated Depreciation for Disallowed Assets						
40	*Accum. Disallowed depreciation [reflect above changes]*	*184*	*200*	*349*	*553*	*165*	*353*
	Total Additions [reflect above changes]	***13,363***	***15,258***	***14,423***	***12,751***	***1,060***	***-2,508***
41	*Previous Year Ending Balance [reflect above changes]*	*424,009*	*451,268*	*424,009*	*446,776*	*0*	*-4,492*
42=1-27+39+40	*Current Year Ending Balance [reflect above changes]*	*451,268*	*451,511*	*446,776*	*443,958*	*-4,492*	*-7,553*
43=(41+42)/2	***Mid-year Balance [reflect above changes]***	***437,638***	***451,390***	***435,392***	***445,367***	***-2,246***	***-6,023***
	Rate Case						
	Total Rate Case						
44	*Opening balance*	*3,711*	*4,110*	*3,711*	*3,832*	*0*	*-278*
45	*Year-end balance*	*4,110*	*4,257*	*3,832*	*3,845*	*-278*	*-412*
46	*Transfers to Intangible [Intangible assets as per auditor]*					*-251*	*-251*
47	*2017 Actual Updates*					*-27*	*-161*
48=(44+45)/2	*Mid-year balance*	*3,911*	*4,184*	*3,772*	*3,839*	*-139*	*-345*
	Less: DSM [included in deferred costs above]						
49	*Opening balance*	*2,484*	*2,445*	*2,484*	*990*	*0*	*-1,455*
50	*Year-end balance*	*2,445*	*2,801*	*990*	*880*	*-1,455*	*-1,921*
51	*DSM disallowed (Paragraphs 478-481)*					*-1,455*	*-1,921*
52=(49+50)/2	*Mid-year balance*	*2,465*	*2,623*	*1,737*	*935*	*-728*	*-1,688*
	Less: Hearing Reserve [included in deferred costs above]						
53	*Opening balance*	*-973*	*-1,029*	*-973*	*-1,026*	*0*	*3*
54	*Year-end balance*	*-1,029*	*-266*	*-1,026*	*-926*	*3*	*-660*
55	*The forecast charge against reserve reduced in 2018 [GRA cost claim now expected in 2019]*					*3*	*-660*
56=(53+54)/2	*Mid-year balance*	*-1,001*	*-647*	*-1,000*	*-976*	*1*	*-329*
	Net Rate Case						
57=44-49-53	*Opening balance*	*2,200*	*2,693*	*2,200*	*3,868*	*0*	*1,175*
58=45-50-54	*Year-end balance*	*2,693*	*1,722*	*3,868*	*3,891*	*1,175*	*2,169*
59=(57+58)/2	***Mid-year balance***	***2,447***	***2,208***	***3,034***	***3,879***	***587***	***1,672***
60	***Working Capital requirements [reflects changes in spending and revenues]***	***5,200***	***5,210***	***5,290***	***5,344***	***90***	***134***
61=43+59+60	**Gross Mid-year Net Rate Base**	**445,285**	**458,808**	**443,717**	**454,590**	**-1,568**	**-4,218**
62	*Net Mid-year Contributions*	*170,826*	*167,181*	*170,785*	*167,112*	*-41*	*-70*
63=61-62	**Net Mid-year Net Rate Base**	**274,459**	**291,626**	**272,931**	**287,479**	**-1,528**	**-4,148**

TOPIC: **Thermal fuel mix**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, Table 2-10, page 2-17

QUOTE:

PREAMBLE: Under the heading “Thermal Fuel Price True-Up (Actual-Forecast) ($000/yr)” the right-hand column is titled “80.7/19.1 mix”

QUESTION:

a) Please confirm that the right-hand column should be titled "80.7/19.3 mix".

b) If part (a) of the question cannot be confirmed, then please explain why the fuel mix will not add up to 100.

ANSWER:

(a) and (b)

Confirmed. The “80.7/19.1 mix” in Table 2-10 is a typographical error and should be “80.7/19.3 mix” consistent with other information shown in the table. There is no impact to the calculations in the table from that error.

TOPIC: **Additions to and removals from rate base**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, Table 1.1-3; and section 2.7 and Table 2-11

QUOTE:

PREAMBLE:

QUESTION:

a) Please provide a table showing the amounts added or removed from each of 2017 and 2018 for each project listed in section 2.7, referencing the relevant direction related to the rate base adjustment and an explanation for the change in rate base for each project. Please also include any amounts moved from work-in-progress to rate base or vice versa and the total change in rate base for each test year and the total change in WIP.

b) Please reconcile and cross-reference the table provided in response to part (a) with Table 1.1-3.

c) Please reconcile and cross-reference Table 2-11 with Table 1.1-3 and the table provided in response to part (a).

ANSWER:

(a) and (b)

Please see YUB-YEC-1-9 Attachment 1 for the requested information. This table cross references Table 1.1-3 as clarified in Attachment 1 to YUB-YEC-1-7, as well as the additional clarifications provided in YUB-YEC-1-7(c), Table 1.

The attachment provides the adjustment made to the project costs included in section 2.7 of the Compliance Filing, including impact to the rate base and capital work-in-progress. Please note that the impact to rate base is provided as a year-end impact, not a mid-year balance impact.

YEC also clarifies below its Compliance Filing with added comments for the following two projects to confirm that there were no actual costs for each project in 2017.

Section 2.7.2.4: Whitehorse Wind 1 Decommission

The Board in its Order 2018-10, paragraph 432 noted that it "accepts that these costs are reasonable and prudent. Accordingly, the Board approves this project and directs YEC to update the associated costs to include 2017 actuals in the compliance filing to this decision."

In section 2.7.2.4 of the Compliance Filing YEC noted that the "costs for the project are included in Compliance Filing rate base, including actual 2017 costs." As illustrated in YUB-YEC-1-9 Attachment 1 and Table 1 in YUB-YEC-1-7 (c), the actual cost of this project in 2017 was $0. Therefore, the text in section 2.7.2.4 should be read as "costs for the project are updated for 2017 actuals at $0."

Section 2.7.2.6: Substation Protection and Control Minor Upgrades

The Board in its Order 2018-10, paragraph 437 noted that it "accepts that it is necessary for YEC to engage in ongoing work at its substations to ensure safe and reliable service and therefore approves this project as applied for by YEC. However, the Board directs YEC to update the costs for this project to include 2017 actuals in the compliance filing to this decision."

In section 2.7.2.6 of the Compliance Filing YEC noted that the "costs for the project are included in Compliance Filing rate base, including actual 2017 costs." As illustrated in YUB-YEC-1-9 Attachment 1 and Table 1 in YUB-YEC-1-7 (c), the actual cost of this project in 2017 was $0. Therefore, the text in section 2.7.2.6 should be read as "costs for the project are updated for 2017 actuals at $0."

(c)

Please see Table 1 below for requested information.

Table 1: Aishihik Electrical & Control Upgrades Actual Costs for 2016 and 2017 as included in Table 2-11 of Compliance Filing with reference to adjustments in Table 1.1-3 (YUB-YEC-1-7 Attachment 1) ($000)

	2016	2017	Total 2016-2017	Note
Original Filing Tab 5, Table 5-2	**259**	**1,284**	**1,543**	
AH2 Control System Replacement	111	508	618	
AH1 Controls Upgrade	117	604	720	
AH0 SS Circuit Breakers	4	84	87	
S-167 Porcelain Insulator	28	44	72	
Aishihik Reactor Cable Replacement		38	38	YUB-YEC-1-7 Attachment 1, Line 22
Aishihik Control - RTU Removal		12	12	
AHC - AH3 Deficiencies		1	1	
Total Compliance Filing	**259**	**1,289**	**1,548**	YUB-YEC-1-7 (c), Table 1 (shows 2017)
Difference	0	5	5	YUB-YEC-1-7 (c), Table 1 (shows 2017)
Kept in WIP			25	YUB-YEC-1-7 Attachment 1, Line 15
Disallowed			38	YUB-YEC-1-7 Attachment 1, Line 22

Section of Compliance Filing	Board Order 2018-10 Para Reference	Project	YUB-YEC-1-7 Attachment 1 [Table 1.1-3] reference	Impact to Rate Base (year-end impact)	Impact to WIP	Note
2.7.1.2	368-370	Aishihik Elevator Shaft Structural Steel Rehabilitation	Line 21; and YUB-YEC-1-7 (c), Table 1	Reduction of $0.200 million in 2017 for disallowed cost; increase of $0.163 million for 2017 actuals update.		The Board disallowed $0.2 million. Please see YUB-YEC-1-7 (c), Table 1 for impact of update for 2017 actuals.
2.7.1.3	373-380	Aishihik Electrical and Control Upgrades	Lines 15 and 22; and YUB-YEC-1-7 (c), Table 1	Reduction of $0.038 million in 2017 for disallowed cost; increase of $0.005 million for 2017 actuals update; reduction of $0.025 million for AH3 control system drawings update cost kept in WIP	Increase of $0.025 million for AH3 control system drawings update cost kept in WIP.	The costs related to AH3 control system drawings update have been moved to WIP; the Board disallowed the $0.075 million for the AH reactor cable replacement - the actual spending was at $0.037989 million (Line 22); AH3 control system drawings update cost at $0.025 million kept in WIP (Line 15).
2.7.1.4	394-395	Communications Upgrades	Line 4; and YUB-YEC-1-7 (c), Table 1	Reduction of $0.039 million in 2017 for actuals update.		YUB-YEC-1-7 (c), Table 1 used 2017 actuals at $0.096 million compared to forecast at $0.135 million.
2.7.1.6	412-413	LNG Third Engine	Line 14; and YUB-YEC-1-7 (c), Table 1		Reduction of $0.365 million for 2017 actuals update.	Remains in WIP.
2.7.1.7	421-422	Directives related to Other Major Capital Projects: Hydro overhauls for WH4, MH2, T&D Breaker Replacements, T&D Line Replacements, Wareham Spillway Gate Hoist Replacement, Whistle Bend Supply/Takhini Upgrade	Line 14; and YUB-YEC-1-7 (c), Table 1	Reduction of $0.849 million in 2017 for actuals update for Hydro Unit #WH4 Overhaul.	Increase of $0.011 million in 2017 for actuals update for T&D Breaker Replacements.	The Board directed YEC to update its 2017 costs to reflect 2017 actuals. As provided in YUB-YEC-1-7 (c), Table 1 the costs for WH4 and T&D Breaker Replacements are updated to use 2017 actuals. No cost for Wareham Spillway Gate Hoist Replacement and Whistle Bend Supply/Takhini Upgrade in 2017 as shown in Table 5-2 of the GRA filing; MH2 and T&D Line Replacements are forecast for 2018.
2.7.2.1	426	Aishihik Control Structure Refurbishment	Line 8	Reduction of $0.325 million in 2018 for disallowed cost.		The Board disallowed $0.325 million.
2.7.2.2	428	Faro Building Diesel Ventilation	Line 9	Reduction of $0.100 million in 2018.		Project has been deferred and removed from 2018 forecast.
2.7.2.3	430	Wareham Dam Blackstart Generator	Line 14; and YUB-YEC-1-7 (c), Table 1	Reduction of $0.120 million in 2017.		Used 2017 actuals.
2.7.2.4	432	Whitehorse Wind 1 Decommission	Line 14; and YUB-YEC-1-7 (c), Table 1	Reduction of $0.112 million in 2017.		This project was delayed to 2018. The actual spending for 2017 was at $0 which was updated in the compliance filing.
2.7.2.5	435	Dawson P158 T1/T2 Transformer	Line 7	Reduction of $0.200 million in 2018 for disallowed cost.		The Board disallowed $0.200 million.
2.7.2.6	437	Substation Protection and Control Minor Upgrades	Line 14	Reduction of $0.050 million in 2017 for actuals update.		The project cost was updated to include 2017 actuals. No spending in 2017.
2.7.2.7	440	Transmission System Protection Upgrades	Line 14; and YUB-YEC-1-7 (c), Table 1	Increase of $0.152 million in 2017 for actuals update.		Used 2017 actuals.

Section of Compliance Filing	Board Order 2018-10 Para Reference	Project	YUB-YEC-1-7 Attachment 1 [Table 1.1-3] reference	Impact to Rate Base (year-end impact)	Impact to WIP	Note
2.7.2.8	442	Callison Voltage Regulator Automation	Line 6	Reduction of $0.115 million in 2018 for disallowed cost.		The Board disallowed $0.115 million.
2.7.2.9	444	Building Condition Report Response				Details of the project is provided in section 2.7.2.9 of the Compliance Filing as directed by the Board.
2.7.2.10	446	Stewart-Minto Local SCADA	Line 5	Reduction of $0.165 million in 2018 for disallowed cost.		The Board disallowed $0.165 million.
2.7.2.11	447	Other Capital Projects Between $100,000 and $1 Million: Aishihik generator fire protection, Aishihik tailrace road and slope, Canyon Lake control structure and dyke refurbishment to implement dam safety recommendations, Whitehorse diesel system grounding for generators, Whitehorse local HMI/historian upgrade, 170 line access, S-150 – Whitehorse main RTU upgrade, Whitehorse-Aishihik-Faro transmission upgrades, 25 kV distribution cut-out replacement, customer extensions, Aishihik emergency signage and lighting upgrade, critical spares – system requirement, Dawson derrick digger, fencing upgrades – various sites, Mayo B door installation for crane inspection, Mayo transient trailer unit, vehicle purchases, voice repeater site for Little Salmon Area, voice repeater site for Mendenhall/Champagne and WRGS hazardous materials containment projects.	Line 14; and YUB-YEC-1-7 (c), Table 1 shows projects over $100,000	Increase of $0.119 million in 2017 for actuals update.	Increase of $0.074 million in 2017 for actuals update.	The project costs for 2017 were updated to use 2017 actuals, where applicable: Aishihik generator fire protection (2018 spending), Aishihik tailrace road and slope (2017 forecast at $44,000, the actual update at $8,758), Canyon Lake control structure and dyke refurbishment to implement dam safety recommendations (2017 forecast at $125,000, the actual update at $146,362), Whitehorse diesel system grounding for generators (2018 spending), Whitehorse local HMI/historian upgrade (2017 forecast at $180,000, the actual update at $182,362), 170 line access (2017 forecast at $350,000, the actual update at $438,535), S-150 – Whitehorse main RTU upgrade (2017 forecast at $125,000, the actual update at $146,784), Whitehorse-Aishihik-Faro transmission upgrades (2017 forecast at $850,000, the actual update at $855,867), 25 kV distribution cut-out replacement (2018 spending), customer extensions (2017 forecast at $475,000, the actual update at $698,735), Aishihik emergency signage and lighting upgrade (2018 spending), critical spares – system requirement (2017 forecast at $100,000, the actual update at $87,599), Dawson derrick digger (2017 forecast at $350,000, the actual update at $360,654), fencing upgrades – various sites (2017 forecast at $75,000, the actual update at $0), Mayo B door installation for crane inspection (2018 spending), Mayo transient trailer unit (2018 spending), vehicle purchases (2017 forecast at $250,000, the actual update at $191,827), voice repeater site for Little Salmon Area (2018 spending), voice repeater site for Mendenhall/Champagne (2018 spending) and WRGS hazardous materials containment (2018 spending).
2.7.3.1	456	Aishihik Generating Station Licence Renewal Project	Remains in WIP; and YUB-YEC-1-7 (c), Table 1		Increase of $0.519 million in 2017 for actuals update.	
2.7.3.2	463	Battery Energy Storage System Project	Remains in WIP; and YUB-YEC-1-7 (c), Table 1		Reduction of $0.485 million in 2017 for actuals update.	
2.7.3.3	470-471	Thermal Plant	Remains in WIP; and YUB-YEC-1-7 (c), Table 1		Reduction of $0.745 million in 2017 for actuals update.	
2.7.3.4	477-483	Demand Side Management (DSM)	Lines 23, 34, 49-52	Reduction of $1.595 million in 2017 and 2018 for disallowed cost.		The Board disallowed spending after 2015 and spending for programs not approved by the YUB.
2.7.3.5	489-490	Resource Plan	Line 14; and YUB-YEC-1-7 (c), Table 1	Increase of $0.011 million in 2017 for actuals update.		

Section of Compliance Filing	Board Order 2018-10 Para Reference	Project	YUB-YEC-1-7 Attachment 1 [Table 1.1-3] reference	Impact to Rate Base (year-end impact)	Impact to WIP	Note
2.7.3.6	494-497	Gladstone Diversion	Line 24	Reduction of $0.221 million in 2017 and 2018 for disallowed cost.		The Board disallowed cost after September 2014.
2.7.3.7	506-507	Marsh Lake	Remains in WIP; and YUB-YEC-1-7 (c), Table 1		Increase of $0.037 million in 2017 for actuals update.	
2.7.3.8	513	Mayo Lake	Remains in WIP; and YUB-YEC-1-7 (c), Table 1		Increase of $0.009 million in 2017 for actuals update.	
2.7.4.1	516	Mayo and Aishihik Climate Change Study	Line 31		See note column.	This project was forecast to remain in WIP during the test years. The forecast expenditures are removed. No costs are included in rate base for the test years in the Compliance Filing. When the project is closed, the actual spending for this projects will be removed from WIP and included under the disallowed costs.
2.7.4.2	519	Time of Use Rate Structure and Smart Grid	Line 29	Reduction of $0.100 million in 2017 for disallowed cost.		The spending was removed from 2017 and 2018 test years.
2.7.4.3	521	Mt Sumanik Wind	Remains in WIP; and YUB-YEC-1-7 (c), Table 1		Increase of $0.028 million in 2017 for actuals update.	
2.7.4.4	525	Northern Diesel Plant Location Study	Line 30	Reduction of $0.100 million in 2018 for disallowed cost.		The spending was removed from 2018 test year.
2.7.4.5	527	Whitehorse Hydro Uprate	Line 32		Reduction of $0.450 million in 2018 for disallowed cost.	The spending was removed from 2018 test year.
2.7.4.6	529	Small Hydro	Line 33		Reduction of $0.625 million in 2018 for disallowed cost.	The spending was removed from 2018 test year.
2.7.4.7	530	Other projects: Detailed line inspection, development of asset management program, forecasting model integration, asset appraisal, general rate application - 2017-2018 and Aishihik remediation work projects	YUB-YEC-1-7 (c), Table 1	Increase of $0.02 million in 2017 for actuals update.	Reduction of $0.467 million in 2017 for actuals update.	The Board approved these projects. The project costs for 2017 were updated to use 2017 actuals, where applicable.

TOPIC: **Whitehorse Hydro Uprate**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, Table 1.1-3; YEC 2017-18 GRA Compliance Filing Application, section 2.7.4.5

QUOTE: "This project was forecast to remain in WIP during the test years. No costs are included in rate base for the test years in the Compliance Filing."

PREAMBLE:

QUESTION:

a) Given that the Whitehorse Hydro Uprate project was forecast to remain in WIP during the test years, please explain why a reduction of $450,000 is included in Table 1.1-3 for this project.

ANSWER:

(a)

The Board in its Order 2018-10, Appendix A, paragraph 527 stated the following:

> The Board considers YEC has not adequately quantified the expected benefits and costs of uprating the Whitehorse hydro units in order to justify an expense of this magnitude for an investigation. Accordingly, the Board denies YEC's proposed Whitehorse hydro uprate project and directs YEC to remove <u>any forecast expenditures</u> and cost recovery related to this project in its compliance filing. *[underline added]*

In compliance with the Board direction, the forecast expenditures were removed in the Compliance Filing as shown in Table 1.1-3 (see Attachment 1, YUB-YEC-1-7). As shown in YUB-YEC-1-7(c), Table 1, this reduction was made to WIP as in the Original Filing this project was forecast to remain in WIP. As in any other case, YEC has complied with the specific direction of the YUB in this Order with respect to this project. The utility did not provide a full justification for this project because it is very early in the planning process and there were no rate impacts from this project in this application. In keeping with past

practice, as YEC advances a supply project, it will provide sufficient justification in a future proceeding for consideration by the Board.

Table 1.1-3 (including the table as adjusted in Attachment 1, YUB-YEC-1-7) deals with all adjustments to capital [changes in rate base as well as changes in WIP]. It shows the adjustments to the spending forecast which flows through into rate base or WIP, as well as separately adjustments to the closed (or already spent) projects where the Board disallowed costs [lines 20-24].

TOPIC: **Small Hydro**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, Table 1.1-3; YEC 2017-18 GRA Compliance Filing Application, section 2.7.4.6

QUOTE: "This project was forecast to remain in WIP during the test years. No costs are included in rate base for the test years in the Compliance Filing."

PREAMBLE:

QUESTION:

a) Given that the Small Hydro project was forecast to remain in WIP during the test years, please explain why a reduction of $625,000 is included in Table 1.1-3 for this project.

ANSWER:

(a)

The Board in its Order 2018-10, Appendix A, pare 529 stated the following:

> The Board finds that YEC has not adequately quantified the benefits and costs of a small hydro project in order to justify an expense of this magnitude on the prefeasibility stage assessment. The Board is of the view that small hydro is better left to other entities such as independent power producers. Accordingly, the Board denies YEC's proposed small hydro project and directs YEC to remove <u>any forecast expenditures</u> and cost recoveries related to this project in its compliance filing. *[underline added]*

In compliance with the Board direction, the forecast expenditures were removed in the Compliance Filing, as shown in Table 1.1-3 (see Attachment 1, YUB-YEC-1-7). As shown in YUB-YEC-1-7(c), Table 1, this reduction was made to WIP as in the Original Filing this project was forecast to remain in WIP. As commented in YUB-YEC-1-10, YEC believes this project has potential to be a cost effective supply solution for ratepayers and will submit a fulsome justification at a future proceeding when appropriate.

Table 1.1-3 (including the table as adjusted in Attachment 1, YUB-YEC-1-7) deals with all adjustments to capital [changes in rate base as well as changes in WIP]. It shows the adjustments to the spending forecast which flows through into rate base or WIP, as well as separately adjustments to the closed (or already spent) projects where the Board disallowed costs [lines 20-24].

TOPIC: **LWRF – new mechanism**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, Appendix 2.1, page 2.1-2

QUOTE: The new mechanism proposed in the 2017-18 GRA to provide that costs for YEC thermal generation savings (excess) are calculated so that YEC's final fiscal year expense for the total expected thermal generation (i.e. YEC expense after all transfers) is 90% LNG and 10% diesel as assumed in the GRA forecast, subject to the constraint that the LNG share of any transfer into or out of the LWRF cannot exceed 100%.

PREAMBLE:

QUESTION:

a) Please explain what YEC means by "new mechanism."

b) Does YEC view the GRA forecast thermal fuel mix as something more than a forecast? If so, please cite the reference in Board Order 2018-10 where the Board specifically approves the GRA forecast fuel mix to include the above assumption and constraint? Further, please explain how the above assumption and constraint are now reasonable for the Board to consider in the compliance filing proceeding.

ANSWER:

(a)

In paragraph 102 of Order 2018-10, the Board directs Yukon Energy in its Compliance Filing to state which fuel mix it is using for the 2018 forecast.

The "new mechanism" is a reference to the 90:10 LNG/ diesel fuel mix ratio mechanism used for the purposes of determining transfers into and out of the LWRF, as set out in the LWRF Term Sheet (Appendix 2.1, Attachment 2.1-1, page 2.1-2). This concept was reviewed in detail in the 2017/18 GRA application as well as in a number of interrogatory

responses filed during the 2017/18 GRA (e.g., YUB-YEC-1-25; JM-YEC-1-13; YUB-YEC-1-42; YUB-YEC-1-43; YUB-YEC-1-39; YUB-YEC-2-6 and YUB-YEC-2-19).

(b)

The thermal fuel mix is part of the thermal generation forecast, i.e., as such, it is part of the forecast and not "something more than a forecast".

In paragraph 102 of Appendix A to Board Order 2018-10, the Board directs YEC to state the fuel mix it is using for the 2018 forecast in its Compliance Filing. In paragraph 293, the Board stated, in reference to the DFPVA, that YEC has stated that it will assume all risks with respect to the thermal fuel mixture (see response to YUB-YEC-1-3 regarding YEC's commitment related to DCF/LWRF, and that no such commitment was made with reference to the DFPVA). The Board in Appendix A to Board Order 2018-10 did not comment on how fuel mix is addressed for the LWRF determinations.

Following the Board's direction, Yukon Energy at page 2-5 of the Compliance Filing states that the Compliance Filing for the 2018 thermal generation forecast continues to use the 90:10 LNG: diesel fuel mix as assumed in the Application. Appendix 2.1 addresses the LWRF and notes at page 2.1-2 that the LWRF also includes reference to the 90:10 LNG: diesel mix "as assumed in the GRA forecast".

The LWRF mechanism as referenced in response to (a) above is applied to address actual versus forecast variance in fuel mix for the LWRF year-end determinations for payments into or out of the LWRF. It was proposed as a reasonable mechanism so that the final YEC fuel cost at year end (i.e., after LWRF determinations) would, to the extent feasible, reflect the approved forecast 90:10 LNG: diesel fuel mix. The mechanism has YEC assuming the costs for any risk that actual overall diesel share as at year end (i.e., after LWRF determinations) may exceed 10%, and thereby increase YEC's average costs for its expected LTA thermal generation.

The constraint "that the LNG share of any transfer into or out of the LWRF cannot exceed 100%" was reviewed in detail during the GRA proceeding (see response to YUB-YEC-2-6, which notes that YEC bears the risk of higher costs due to final diesel share [after DCF determinations] exceeding the 10% assumed in the GRA forecast).

TOPIC: **LWRF**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, Appendix 2.1, page 2.1-2

QUOTE: A key requirement in this regard is to separate thermal generation changes due to overall YIS load changes from thermal generation changes due to water condition changes.

PREAMBLE:

QUESTION:

a) Please explain how the above is accomplished. Please provide any relevant references in the compliance filing or supporting documentation in your response.

ANSWER:

(a)

As noted in the response to YUB-YEC-1-1 water-related forecast risk is borne by ratepayers, while load-related forecast risk not addressed by the ERA is borne by the utility.

An increase or decrease in thermal generation over a fiscal year may relate to changes in water availability and/or changes in load. Consequently, at year end it is important to separate, to the extent feasible, the following changes in the thermal generation requirement from the last approved test year forecast:

- Changes in thermal generation requirement compared to the approved forecast **that relate to changes in load** (for which Yukon Energy bears forecast-related risk outside of that which is addressed through the ERA); and

- Changes in thermal generation requirement compared to the approved forecast **that relate to changes in water conditions** (which is a ratepayer risk addressed through LWRF mechanism).

Total change from the last approved forecast at each year-end is easily determined for overall firm generation requirement and for overall thermal generation (net of capital, maintenance, and RFID requirements).

In order to separate load versus water condition change impacts on the overall thermal generation variance, it is necessary to update the forecast thermal generation for the actual load, using the same water conditions as assumed for the GRA forecast.

In summary, the load versus water condition change impacts on thermal generation are separated as follows:

- Step 1: Determine the change in thermal generation volumes (actual thermal generation [net of capital, maintenance, and RFID requirements] less GRA forecast thermal generation).

- Step 2: Determine LTA Thermal Generation (i.e., thermal generation assuming LTA water conditions as assumed for the GRA forecast) at the actual system firm generation. This is accomplished using tables and procedures approved by the Board in the GRA. There is no need to have new model results or runs.

- Step 3: Determine change in thermal generation due to water condition changes, i.e., the Step 1 actual thermal less the LTA Thermal Generation for actual load from Step 2.

- Step 4: Determine change in thermal generation due to load changes, i.e., the Step 1 actual thermal generation changes less the Step 3 change due to water conditions.

The Step 2 methods for estimating hydro and thermal generation for the actual load (versus the GRA forecast load) at LTA water conditions are elaborated on below.

The 2018 hydro and thermal generation forecast included in the Compliance Filing is based on LTA water conditions as reflected in Table 2.1-4 of the Compliance Filing. As noted in the response to YUB-YEC-1-2 this is considered the most reasonable and accurate hydro and thermal generation forecast for the 2018 test year forecast load. Consequently, in order to separate load versus water condition change impacts on the overall thermal generation variance for 2018, the assessment must consider the expected

thermal and hydro generation requirement at LTA water conditions (in a manner consistent with assumption and processes used to develop Table 2.1-4) based on actual 2018 load.

Three different potential approaches are identified below to determine and account for LTA hydro and thermal generation changes from forecast that are due to changes in load versus changes due to water conditions (as required by Board Order 2018-10, paragraph 323). Each approach requires that the thermal requirement be determined based on the actual load for 2018 and LTA water conditions.

1. **The Diesel Contingency Fund (DCF) or LWRF Term Sheet Table –** The DCF Term Sheet table (Table 3.4-1 in the Original Application) was proposed in the 2017/18 GRA to determine annual expected YEC thermal generation based on long-term average water conditions for YEC hydro generation for a relatively wide range of YEC grid loads (net of expected wind and expected Fish Lake generation).

    - The table was used to determine annual expected YEC thermal generation for each test year based on forecast loads for each test year.[1]

    - At year end the same table was approved in the Compliance Filing to be used (without any new model runs) to determine, for the DCF purpose, expected thermal generation at the actual load and LTA water conditions.[2]

2. **Fixed Change Factor –** The Fixed Change Factor has been introduced in the Compliance Filing in response to Board directions for YEC to simplify the determination of LTA forecast thermal generation at actual YIS load for any fiscal year (see Appendix 2.1 of Compliance Filing). As described in detail in response to YUB-YEC-1-14, a Fixed Change Factor is proposed as a simplified approach to isolate changes in thermal generation requirement that are due to changes in water

[1] Attachment 2.1-2 of the Compliance Filing reviews the changes made in this table for the 2018 Compliance Filing to reflect change in the annual load shape due to changes in the Minto industrial forecast load.

[2] This approach is caveated by a requirement to secure approval for an updated Term Sheet Table if there is a material change in LTA hydro system capability due to changes in load shape, installed capacity, licensing/ permits or other factors.

availability from changes in thermal generation requirement due to changes in load.[3]

3. **New Additional LTA Model Runs –** A third approach is simply to request Board approval at year end for a new LTA model run to determine the expected hydro generation and thermal requirement for the actual loads (compared to LTA hydro generation and thermal requirements at the last approved GRA test year load). This approach was abandoned in prior GRAs in favour of the Term Sheet Table approach in order to avoid the need to re-run any model; however, as noted above, new model runs are still required whenever there is a material change in LTA hydro system capability due to changes in load shape, installed capacity, licensing/ permits or other factors.

Fixed Change Factor Example

Yukon Energy has incorporated a Fixed Change Factor into the Compliance Filing LWRF to address Board concerns noted in Order 2018-10 that the "current DCF mechanism is complex", and a simpler mechanism for adjusting for variances between the approved forecast for hydro generation and thermal generation and actual hydro generation and thermal generation in a test year is needed".

Table 2.1-1 from Attachment 2.1-1 of the Compliance Filing provides an example for the LWRF determination for 2018 year end. As outlined below – this example outlines how thermal changes due to grid load are separated from thermal generation changes due to changes in water conditions.

Table 2.1-1 notes a 20.04 GWh change in 2018 thermal generation when the GRA LTA generation forecast is compared to 2018 actuals:

- 2018 GRA forecast LTA Thermal Generation 16.36 GWh

[3] The calculations already exclude thermal generation that relate to RFID, capital and maintenance. As reviewed in Appendix 2.1 [the LWRF Term Sheet (Attachment 2.1-1) and Attachment 2.1-2], this approach is based on the updated expected LTA generation for 2018 (Table 2.1-4) used for the 2018 GRA hydro and thermal generation forecast. As noted for the LWRF Term Sheet Table option, this approach is also caveated by a requirement to secure approval for updates if there is a material change in LTA hydro system capability due to changes in load shape, installed capacity, licensing/ permits or other factors (see response to YUB-YEC-1-15).

- 2018 Actual thermal generation[4] 36.40 GWh
- Change in thermal generation **20.04 GWh**

Table 2.1-1 notes a 26.74 GWh variance in 2018 load (2018 actual compared to 2018 forecast).[5]

- 2018 Forecast Load 420.27 GWh
- 2018 Actual Load 447.00 GWh
- 2018 Load Variance **26.74 GWh**

As noted, further assessment is needed to determine how much of the 20.04 GWh change in thermal generation requirement for 2018 relates to changes in water conditions, and how much relates to the change in load.

The Fixed Change Factor is applied as a simplified method to determine the LTA thermal generation share of any change in YIS load from the GRA forecast YIS load, i.e., not every GWh of incremental load will result in a GWh of incremental thermal generation.

The Fixed Change Factor assumes that 45.3% of the 26.74 GWh load variance would result in thermal generation at LTA water conditions, i.e., the actual increase in load in 2018 resulted in an added 12.11 GWh of load-related LTA thermal generation over the 2018 forecast. In summary, this results in a determination of LTA thermal generation at actual load of 28.46 GWh (16.36 GWh GRA Forecast LTA thermal generation + 12.11 GWh of added thermal generation in 2018 due to the increase in load [differences due to rounding]).

Consequently, 7.94 GWh of the total 20.04 GWh change in 2018 thermal generation relates to a change in water availability.

- Actual 2018 Thermal Generation 36.40 GWh
- LTA Thermal Generation at Actual Load 28.46 GWh[6]
- Thermal Generation Change due to Water Changes **7.94 GWh**

[4] Actual Thermal Generation excludes RFID, capital and maintenance thermal.
[5] Actual Thermal Generation excludes RFID, capital and maintenance thermal.
[6] 26.74 GWh load variance multiplied by 45.3% Fixed Change Factor and added to the 16.36 GWh of 2018 GRA forecast LTA thermal generation (differences due to rounding).

The LWRF payment to YEC (charge to YEC) for costs to changes in water availability is based only on the 7.94 GWh as determined above (and does not include thermal related 2018 load growth).

TOPIC: **LWRF**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, Appendix 2.1, pages 2.1-2 to 2.1-3; Attachment 2.1-1, page 2.1-4; Appendix A to Board Order 2018-10, paragraph 323

QUOTE:

PREAMBLE: The example provided regarding the LWRF appears to calculate the difference in thermal generation due to changes in water levels for the actual load.

QUESTION:

a) Does YEC consider the Board's statement in the preamble to be accurate? Please explain why or why not.

b) Paragraph 323 from Appendix A to Board Order 2018-10 states "YEC will take the forecast risk for incremental generation costs for incremental loads outside of the forecast period with the exception of incremental load covered by the ERA. YEC is directed to amend its DCF term sheet to comply with these directions." (Footnote removed.) Please explain how the example provided by YEC separates the incremental generation and load from the forecast levels of generation and load and how those amounts are removed from LWRF considerations.

c) Based on your response to part (b), why does YEC consider that its proposed LWRF is in complete compliance with the Board's direction in paragraph 323?

ANSWER:

(a)

The statement in the preamble is generally accurate. As noted in the response to YUB-YEC-1-1, water-related forecast risk is borne by ratepayers, while load-related forecast risk is borne by the utility. Appendix A to Board Order 2018-10 also concludes (para 318)

that “a utility should neither make a profit nor suffer a loss from variances in forecasting due to water levels. The Board considers that the risk of low water conditions, with respect to added costs for thermal generation, should be borne by the customers of the utility.”

As such, where thermal generation requirements vary from approved forecasts at year end it is necessary to determine how much of the actual change in thermal generation compared to forecast relates to **changes in load**, and how much relates to **changes in water conditions**. In order to do this, it is necessary to assess what the expected thermal requirement would be at the actual load (compared to the approved forecast).

See response to YUB-YEC-1-13 for a detailed explanation regarding how thermal generation changes due to actual YIS grid load changes are separated from thermal generation changes due to actual changes in water conditions.

(b)

The proposed approach included in the LWRF (outlined in Appendix 2.1 and 2.2 of the Compliance Filing) complies with paragraphs 321 and 322 of Appendix A to Board Order 2018-10. YEC understood that in this context its proposed approach also complied with paragraph 323. Specifically, the proposed LWRF ensures that YEC takes the forecast risk for incremental load changes from the approved forecast (outside of that which relates to the ERA), while ratepayers bear the risk for changes in water conditions compared to the approved forecast. This complies with the following directions of the Board:

- “… the Board directs YEC to create a deferral account that records the variance between actual thermal generation fuel costs (based on volume only) and the GRA thermal generation fuel costs (based on volume) that are due to changes in water conditions.” (para 321)

- “…the deferral account will be adjusted for changes in hydro generation that are a result of changes in water availability. YEC is directed in its compliance filing, to explain the method it will use to determine the variance in hydro generation due to water availability.” (para 322)

- "YEC will take the forecast risk for incremental generation costs for incremental loads outside of the forecast period with the exception of incremental load covered by the ERA." (para 323) YEC understood, in the context of the above

directions and past precedent, that the referenced "forecast risk for incremental generation costs for incremental loads" was net of risks related to forecast water conditions.

In order to determine changes in thermal generation that result from changes in water availability (as required to comply with the above directions from paragraphs 321 and 322 of Appendix A to Order 2018-10), changes in thermal generation at LTA water conditions that result from changes in grid load must be identified and accounted for. If the impact of the actual change in load compared to test year forecast is not taken into consideration it is not possible to understand or isolate how much the change in actual thermal requirement relates to load growth, and how much relates to changes in water availability from the assumed LTA water conditions.

Question (b) asks how "YEC separates the incremental generation and load from the forecast levels of generation and load and how those amounts are removed from LWRF considerations". YEC has reviewed in response to YUB-YEC-1-13 how the forecast and actual load and generation have been addressed for LWRF considerations. LWRF impacts from water condition changes are thereby determined for the actual thermal generation (by comparing actual thermal generation to LTA thermal generation at the **actual load**), looking at only forecast thermal generation.

To be clear, absent new model analysis, there is no basis to estimate what the actual thermal generation would have been with only the **forecast load**.

Further, additional analysis to have LWRF determinations based only on the forecast load was not considered or discussed during the proceeding. In any event, it would appear that such an approach would result in YEC (and AEY in the case of ERA impacts) bearing water related thermal generation cost changes that are associated with changes in loads from the approved forecast which would not comply with the above directions in paragraphs 321 and 322 or be in accordance with normal principles established in Canada for utilities. See also responses to YUB-YEC-1-17 and YUB-YEC-1-20.

As reviewed in response to YUB-YEC-1-13, the LWRF proposal in the Compliance Filing simplifies the method used to determine the variance in hydro generation due to water availability.

- As noted in the LWRF Term Sheet – annual expected LTA thermal generation requirements for the 2018 GRA test year are determined based on LTA hydro and wind generation conditions at test year forecast firm load on the Yukon Integrated System (YIS) and Table 2.1-4 in Attachment 2.1-2 of the Compliance Filing.

- At actual YIS firm load, LTA thermal generation (i.e., thermal generation assuming the same water conditions for hydro generation as approved for the GRA thermal forecast) equals the GRA expected LTA thermal generation plus a Fixed Change Factor of 45.3% share of the changes in YIS firm load (actual minus approved GRA forecast).

At year end the LWRF is adjusted for the variance between actual thermal generation (after removal of generation for RFID, capital and maintenance) and GRA approved forecast thermal generation (excluding generation for capital and maintenance) that is due to changes in water conditions from what was assumed for the GRA forecast hydro generation.

(c)

As noted, in part (b) the proposed LWRF isolates changes in thermal generation requirements from GRA forecast that relate to water availability from changes in thermal generation requirements that relate to changes in load. Only the thermal generation changes that relate to changes in water availability are addressed in the LWRF as risks borne by ratepayers. Changes in thermal generation that relate to changes in load are either a risk borne by YEC or are addressed through the ERA as load related risk that is addressed by the wholesale customer.

As reviewed in the response to part (b) above, YEC understands that its proposed approach completely complies with Board directions in paragraphs 321 and 322 of Appendix A of Order 2018-10, and with YEC's understanding of the direction in paragraph 323 that "YEC will take the forecast risk for incremental generation costs for incremental loads outside of the forecast period with the exception of incremental load covered by the ERA".

TOPIC: **Updates to the LWR Term Sheet**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, Appendix 2.1, page 2.1-3

QUOTE: The LWRF Term Sheet specifies that YEC will provide the Board, for review and approval, an update to the Fixed Change Factor when required in future to address material changes in LTA hydro system capability due to changes in loads, installed capacity, licensing/permits or other factors.

PREAMBLE: The Board would like to understand the sensitivities regarding the LWRF Term Sheet.

QUESTION:

a) In terms of load, is there a threshold amount that would be considered a material change in system capability and would warrant an update to the LWRF Term Sheet? If not, how would a material change be determined?

b) In terms of installed capacity, is there a threshold amount that would be considered a material change in system capability and would warrant an update to the LWRF Term Sheet?

c) In terms of licensing/permits, is there a threshold amount that would be considered a material change in system capability and would warrant an update to the LWRF Term Sheet?

d) What other factors does YEC contemplate that may cause YEC to require an update to the LWRF Term Sheet?

ANSWER:

(a) to (c)

As reviewed in response to YUB-YEC-1-13, the referenced update requirements for LTA hydro generation determinations (as needed for the DCF or LWRF year-end assessments)

has been noted in past DCF term sheets as approved by the Board. The basic update requirement requires new YECSIM model assessments in each case (including the Fixed Change Factor approach proposed in the Compliance Filing) to reflect the changed parameters.

Prior iterations of the term sheet table did not contemplate a specific threshold amount that would be considered a material change in load, installed capacity, license/ permits or other factors affecting system capability. The introduction of the Fixed Change Factor for the LWRF in the Compliance Filing, however, may introduce a need to consider a load change threshold related to this new simplification.

The following are noted as regards YEC's assumptions and responses related to potential "material change" thresholds for these factors that would warrant an update to the LWRF Term Sheet:

- **Load – General for any DCF/ LWRF approach:** The Diesel Contingency Fund Term Sheet noted that an update to the Term Sheet Table (Table 3.4-1) would be provided in future when required to address material changes in LTA hydro system capability due to changes in loads. Table 3.4-1 provided thermal generation requirements for a range of annual loads (from 370 GWh to 485 GWh) – and as such a change in load within this range would not drive a requirement to update the table. The key threshold for such an update for loads within this range with the earlier DCF Term Sheet Table approach (including updates to Table 2.1-4 in the Compliance Filing that covers a range of annual loads from 400 GWh to 450 GWh) relates instead to changes in load that materially change annual load shape (e.g., addition of new industrial customer or change in annual load profile for an existing industrial customer). For example, in the 2012/13 GRA separate versions of Table 3.4.1 were provided (one for 2012, and one for 2013 that would apply depending on whether or not Whitehorse Copper Tailings mine commenced operation). In the current Compliance Filing, Table 2.1-4 updated Table 3.4-1 from the Application to address the material change in Minto mine industrial load annual shape. In short, YEC has understood that these types of load shape changes were treated as "material load changes" that warrant an update to the DCF/ LWRF Term Sheet.

- **Load - Added considerations with Fixed Change Factor:** The LWRF Term Sheet in the Compliance Filing uses a simplified approach compared to the earlier DCF Term Sheet. Due to this simplification, the use of the Fixed Change Factor

locks in thermal generation as a fixed share of any load change from the approved GRA forecasts. Variance of LTA thermal generation from the underlying LWRF Term Sheet Table (e.g., Table 2.1-4 in the Compliance Filing) will increase as load change from the GRA forecast increases. Based on Attachment 2.1-2 and Table 2.1-4 as reviewed below, variances of 16% to 22% occur in LTA thermal generation changes for a 20 GWh plus or minus load change from the 2018 forecast load of 420.27 GWh – implying that a 20 GWh load change might constitute a reasonable change threshold for use of the 45.3% Fixed Change Factor (which, when exceeded, would provide a basis to go back to the underlying table used for the GRA Term Sheet, i.e., Table 2.4-1).

- 20 GW.h increase in load – from 420.27 to 440.27 GWh
  - The Fixed Change Factor at 45.3% increases LTA thermal generation by 9.06 GWh at 20 GWh load growth.
  - Table 2.1-4 information indicates that expected thermal increases at 10.75 GWh for 20 GW load growth.
  - The variance with the simplified Fixed Change Factor reduced LTA thermal increase by 1.69 GWh (about 16%).

- 20 GW.h decrease in load – from 420.27 to 400.27 GWh
  - The Fixed Change Factor at 45.3% decreases LTA thermal generation by 9.06 GWh at 20 GWh load decrease.
  - Table 2.1-4 information indicates that expected thermal increases at 7.408 GWh for 20 GW load decrease growth.
  - The variance with the simplified Fixed Change Factor increases LTA thermal increase by 1.65 GWh (about 22%).

- **Installed Capacity:** In addressing "installed capacity", the focus for any change is on renewable generation capacity. Changes in thermal generation capacity (even if material) would not require an update to the LWRF Term Sheet. Changes in renewal installed generation capacity are directly relevant to the LWRF Term Sheet, and are also likely to occur in "material" increments that would require an update to the LWRF Term Sheet. In practice, any new addition to renewable generation capacity would likely be treated as a "material change".

- **Licensing/Permitting:** Conditions for licensing/ permitting existing hydro facilities (or to include new renewable facilities to the YIS) that result in changes in LTA

renewable generation capability can require that the LWRF Term Sheet be updated. Based on the threshold for new installed renewable capacity as reviewed above, licensing/permitting will be automatically addressed as part of the in-service of such new capacity. As regards changes in licensing/permitting for existing renewable facilities, it may be difficult to specify a clear change threshold for adjusting the LWRF LTA determinations between GRAs - the overall approach will continue to rely on judgement as to whether a change appears to have a "material impact" on LTA renewable generation.

(d)

Yukon Energy is not at this time aware of other factors that would require an update to the LWRF Term Sheet between GRAs to address changes in LTA renewable generation capability. Were Yukon Energy to become aware of such additional factors it would update the Board and address such changes as required.

TOPIC: **Wind generation**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, Attachment 2.1-1, page 2.1-1, footnote 10

QUOTE: Unless otherwise noted, AEY Fish Lake generation based on long-term average as approved by the Board Order 2014-06 at 8.73 GW.h and the last approved YEC wind generation (wind generation ceased to be available in 2017). The Fish Lake long-term average generation for 2012 and 2013 was at 4.38 GW.h due to unavailability of Unit #1. YEC's 2017/2018 GRA compliance filing assumes Fish Lake hydro long term average generation of 8.39 GW.h for 2018, based on information provided by AEY, and no wind generation capability. (Underlining added.)

PREAMBLE:

QUESTION:

a) Please explain the reasons that wind generation ceased.

b) Have YEC's wind generation assets been removed from service?

c) If the answer to part (b) is affirmative, have the wind generation assets been removed from rate base? Please explain.

d) If the assets have not been removed from rate base, please explain how any wind generation assets in rate base are "… used or required to be used to provide service to the public, and may include a rate base from property under construction, or constructed or acquired, and intended to be used in the future to provide service to the public…" in accordance with section 32(1) of the *Public Utilities Act*.

ANSWER:

(a) to (d)

Yukon Energy had two wind turbine assets on Haeckel Hill near Whitehorse designated WW1 and WW2. As reviewed below, wind generation ceased by the end of 2017 due to these assets being at end of life or retired.

- WW1 is the older unit, installed in approximately 1993 with a generation capacity of 150 kW. The unit has experienced maintenance issues going back to 2012 and was deemed end of life in 2017 due to the degradation of key components and no access to parts as this unit is obsolete. The turbine was physically disassembled during 2018.

- WW2 was installed in approximately 2000 with an installed generation capacity of 660 kW; in late 2017, there was a failure of a major component (generator). Due to the replacement cost and the age of the unit, it was deemed retired in 2018.

These assets were written off from property plant and equipment accounting records in 2018. Because the GRA for 2017/18 was already filed at this point, the assets have remained in rate base. When YEC files its next GRA, 2018 actuals will reflect the removal of these assets from rate base. The net amount of the mid-year asset impact from these wind generation assets on 2018 GRA forecast rate base in the Compliance Filing approximates $400,000.

TOPIC: **LWRF thermal savings (costs)**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, Attachment 2.1-1, page 2.1-2; Appendix A to Board Order 2018-10, paragraph 323

QUOTE: YEC thermal generation savings (excess) are calculated on an annual basis for the LWRF based on the variance between actual thermal generation and LTA thermal generation at the actual YIS load. (Compliance filing, Attachment 2.1-1, page 2.1-2, footnote removed)

323. To draw from the LWRF due to low water levels, YEC will have to submit an application to the Board requesting a drawdown of the fund indicating that the application is due to changes in hydro generation because of changes in water levels from those contained in the last Board- approved forecast. YEC will take the forecast risk for incremental generation costs for incremental loads outside of the forecast period with the exception of incremental load covered by the ERA. YEC is directed to amend its DCF term sheet to comply with these directions. Conversely, when the fund requires replenishment, YEC can apply to the Board for rate rider to replenish the LRWF. YEC, in its compliance filing, may submit any potential ceiling for the LWRF rate rider. (Appendix A to Board Order 2018-10, paragraph 323, footnote removed)

PREAMBLE:

QUESTION:

a) As per paragraph 323 of Appendix A to Board Order 2018-10, should the calculation of the thermal generation savings be limited to the forecast level of load? Please explain and provide any alternatives for calculating the thermal generation savings.

ANSWER:

(a)

No.

As reviewed in response to YUB-YEC-1-14, the LWRF year-end calculation of thermal generation changes due to changes in water conditions should be based on actual generation load and not limited to the forecast level of generation load.

In order to properly assign costs based on risk ownership, the change in load from forecast to actual must be analyzed to determine how much of the actual thermal generation in 2018 relates to changes in load from the GRA forecast (which is a risk borne by the utility) and how much of actual thermal generation in 2018 relates to changes in water conditions from the GRA LTA forecast (which is a risk borne by ratepayers). YEC is proposing to complete this analysis through application of a Fixed Change Factor to the change in load (see YUB-YEC-1-14).

As noted in YUB-YEC-1-14, absent new model analysis there is no basis to estimate what the actual thermal generation would have been with only the **forecast load**.

Further, additional analysis to have LWRF determinations based only on the forecast load was not considered or discussed during the proceeding. In any event, it would appear that such an approach would result in YEC (and AEY in the case of ERA impacts) bearing water related thermal generation cost changes that are associated with changes in loads from the approved forecast which would not comply with the above directions in paragraphs 321 and 322 or be in accordance with normal principles established in Canada for utilities. See also responses to YUB-YEC-1-13, YUB-YEC-1-17 and YUB-YEC-1-20.

TOPIC: **LWRF thermal savings (costs)**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, Attachment 2.1-1, page 2.1-2

QUOTE: Starting with YEC fiscal year 2018, costs for YEC thermal generation savings (excess) are calculated so that YEC's final fiscal year expense for the total expected thermal generation (i.e., YEC expense after all transfers) is 90% LNG and 10% diesel, subject to the constraint that the LNG share of any transfer into or out of the LWRF cannot exceed 100%. Fuel costs for this calculation are based on the last approved average cost of LNG and diesel fuel for YEC per kWh based on the most recent YEC GRA. The LWRF example in Table 2.1-3 reflects these requirements based on fuel prices in the 2017/18 GRA. (Footnote removed.)

PREAMBLE:

QUESTION:

a) Please explain why YEC has proposed that the term sheet defines the thermal fuel mix.

b) What happens if the thermal fuel mix is not fixed for the purposes of the calculation?

c) Please confirm that thermal fuel prices used for the LWRF will be reset every YEC GRA.

d) Could thermal fuel prices be reset separately from the GRA, e.g. in an AEY GRA decision? Please explain why or why not.

ANSWER:

(a)

The LWRF Term Sheet determines the LWRF year-end procedures for fuel cost amounts paid into or out of the LWRF. In addition to determining expected overall thermal generation volume for the actual firm load, the LWRF procedures must also determine the final fuel mix for the expected thermal generation based on the actual firm load.

The thermal mix assumption is therefore necessary as part of the LWRF Term Sheet to allocate the resultant electricity volume into costs, i.e., in order to get to the expected thermal generation cost. The kWh thermal generation expectation has to be allocated to LNG or diesel which have different unit costs and therefore will affect the overall expected generation expense of the utility.

The response to YUB-YEC-1-12 (a-b) reviews the Compliance Filing proposal on fuel mix forecast for the 2018 test year forecasts and for the LWRF determinations at each year-end.

Actual LNG and diesel generation amounts are determined and reported in the year-end LWRF Annual Reports. LWRF final determinations for payments into or out of the LWRF are based on “expected thermal generation” (i.e., LTA thermal generation for the actual grid generation load). Transfers into or out of the LWRF at year end address differences between expected and actual thermal generation (with the result that YEC’s final thermal generation cost expense for the year is based on expected rather than actual thermal generation). Assumptions are required to determine the share of this balance that is assigned to LNG versus diesel generation.

The LWRF fuel mix mechanism as referenced in the question’s LWRF Term Sheet quote is applied to address actual versus forecast variance in fuel mix for the LWRF year-end determinations for payments into or out of the LWRF. It was proposed as a reasonable mechanism so that the final YEC fuel cost at year end (i.e., after LWRF determinations) would, to the extent feasible, reflect the approved forecast 90:10 LNG: diesel fuel mix. The mechanism has YEC assuming the costs for any risk that actual overall diesel share as at year end (i.e., after LWRF determinations) may exceed 10%, and thereby increase YEC’s average costs for its expected LTA thermal generation.

The constraint “that the LNG share of any transfer into or out of the LWRF cannot exceed 100%” was reviewed in detail during the GRA proceeding (see response to YUB-YEC-2-6, which notes that YEC bears the risk of higher costs due to final diesel share [after DCF determinations] exceeding the 10% assumed in the GRA forecast). This constraint

recognizes that the year-end fuel mix cannot in fact be 'fixed' and may vary from the 90:10 LNG: Diesel fuel mix forecast in the GRA for 2018.

(b)

Absent the above proposed fuel mix mechanism in the LWRF Term Sheet it is unclear what other options might be considered.

Some rules are required to address fuel mix adopted for LWRF year-end payments into or out of the LWRF. The proposed approach focuses on consistency with the GRA forecasts for LTA hydro and thermal generation needed to supply load requirements. Options which look only at "actual fuel mix" for actual generation in a year may have no clear relationship to the LTA water conditions (which are the basis for the LWRF determinations for thermal generation changes related changes in water conditions), and would expose YEC potentially to new added cost risks (whenever this mix has diesel share materially greater than 10%).

(c)

Confirmed.

(d)

Thermal fuel prices for YEC's rates and Rider J are part of YEC's GRA approved revenue requirement, and are then used for the LWRF determinations. Any change in the assumed GRA forecast fuel price that adjusts the LWRF determinations would also require a corresponding adjustment to rates (i.e., Rider J for YEC).

In YEC's opinion, the GRA forecast thermal fuel prices could not be addressed in separate proceedings (e.g., an AEY GRA) where YEC has not made a specific application to amend its revenue requirement.

It is not clear how resetting GRA forecast fuel rates would be advantageous to any party; rates are set based on market conditions at the time of the application and any variance from this rate is tracked and collected/refunded through the Rider F/DFPVA mechanism. YEC is not aware of any justification or material benefit for the costs and efforts needed for such an added proceeding to reset approved rates and adjust Rider J between GRAs.

The existing Rider F and DFPVA mechanisms ensure that fuel price variances related to actual thermal generation are addressed, and that all fuel price changes related to actual thermal generation are directly passed on through Rider F to all energy sales.

TOPIC: **LWRF, quantum and cap**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, page 2-18 and Attachment 2.1-1, page 2.1-3; Appendix A to Board Order 2018-10, paragraph 323

QUOTE: In any year when the balance in the LWRF falls outside of the approved LWRF cap range at fiscal year end, YEC shall apply to the Board for approval of a rate rider to dispense with the balance that is outside of that range within 60 days of the fiscal year end. (Compliance filing, page 2.1- 3)

To draw from the LWRF due to low water levels, YEC will have to submit an application to the Board requesting a drawdown of the fund indicating that the application is due to changes … Conversely, when the fund requires replenishment, YEC can apply to the Board for rate rider to replenish the LRWF. (Compliance filing, page 2-18)

PREAMBLE:

QUESTION:

a) Does the first quoted statement above in the LWRF Term Sheet comply with the directions from paragraph 323 of Appendix A to Board Order 2018-10? Please explain.

ANSWER:

(a)

The first quoted statement relates to the requirement in the Compliance Filing to apply to the Board for a rate rider refund when the LWRF exceeds the approved maximum cap (i.e., the current +$8 million cap). This does not specifically relate to the matters addressed in the second quoted statement from paragraph 323 of Appendix A of Order 2018-10 which relates to YEC's withdrawal from the fund at a year-end based on changes in thermal generation requirements due to actual water availability being less than LTA forecast water availability, and approval of any new rate rider required to replenish the

LWRF if it falls below the minimum approved cap (i.e., the current - $8 million minimum cap).

In Yukon Energy's view, the above first statement and the proposed operation of the LWRF as outlined in the Term Sheet provided as Attachment 2.1-1, are consistent with Board Order 2018-10 (including directions provided in paragraph 323 of Appendix A to that Order).

Paragraph 324 of Appendix A of the Board Order 2018-10 notes that the DCF "is currently at or around its cap of $8,000,000" and directs that the balance in the DCF is to be transferred to the LWRF. The Board also notes that it "is not persuaded by the submissions of parties that a change in the cap is required". Based on this direction the $8 million cap for the DCF was retained for the LWRF, along with provisions as previously approved for the DCF for a rate rider to refund amounts in excess of this maximum cap.

As noted in the Term Sheet Provided as Attachment 2.1-1 (see Page 2.1-3), an annual report is required to be filed with the Board detailing additions and deletions to the fund and providing a forecast of water conditions for the next year. The annual report to the Board would also include a proposed rate rider to refund/ collect any amount that exceeds the approved +/- $8 million cap. The Board will direct YEC on the additions and deletions to the Fund and on any proposed rate or refund rider.

TOPIC: **Determination of fixed change factor for the 2017-18 GRA**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, Attachment 2.1-2

QUOTE:

PREAMBLE:

QUESTION:

a) If adjustments to the LWRF are limited to the latest approved GRA forecast generation level, please explain why a fixed change factor is necessary.

ANSWER:

(a)

As reviewed in detail in YUB-YEC-1-13 and YUB-YEC-1-14, the Fixed Change Factor is applied to simplify the determination of the water-related impacts on LTA forecast thermal generation at **actual** YIS load for any fiscal year. There would therefore be no obvious role for the Fixed Change Factor if the LWRF was prevented from assessing the impact of water condition changes on actual thermal generation related to actual YIS load.

Table 2.1-1 from Attachment 2.1-1 of the Compliance Filing provides an example for the LWRF determination for 2018 year end, and notes a 20.04 GWh change for 2018 thermal generation when the GRA forecast is compared to 2018 actuals. Further assessment is needed to determine how much of the 20.04 GWh change in thermal generation requirement for 2018 relates to changes in water and how much relates to load growth. The Fixed Change Factor is applied to determine how much of the 2018 change in thermal generation relates to the 26.74 GWh of load growth and how much relates to changes in LTA water availability, indicating that 7.94 GWh is estimated to be due to changes in water conditions. This assessment is based on actual load.

As reviewed in the responses to YUB-YEC-1-14 and YUB-YEC-1-17, limiting the LWRF year-end determination to the forecast level of generation load (i.e., the 420.27 GWh for 2018) would require additional analysis to divide the above 7.94 GW.h water availability changes in thermal generation into two parts, i.e., changes related to the forecast load

versus changes related to the actual load. Such additional analysis has not been considered or discussed during the proceeding, and YEC is not currently aware of what approaches might reasonably be considered – however, it is possible that LTA determinations will still be needed related to actual load, and thus the Fixed Change Factor might still be a useful simplified analysis to address this requirement.[1]

As reviewed in the responses to YUB-YEC-1-14 and YUB-YEC-1-17, it would appear that such an added separating of thermal generation cost changes to isolate water-related changes only to the forecast GRA load would also result in YEC (and AEY in the case of ERA impacts) bearing water related thermal generation cost changes that are associated with changes in loads from the approved forecast. YEC's understanding is that this outcome would not comply with the directions (as noted in YUB-YEC-1-14) in paragraphs 321 and 322 or be in accordance with normal principles established in Canada for utilities.

[1] By way of example, the percentage of actual thermal over LTA thermal for the actual load in the Table 2.1-1 example is 7.94/28.46 = 27.9%; this same percent might be suggested to estimate the share of water related thermal generation change assigned to the forecast GRA load, e.g., 27.9% times 16.36 GWh LTA thermal at the forecast load (yields 4.56 GWh of thermal generation change due to changes in water conditions). This would assign to YEC (with perhaps some share to AEY) the fuel costs for 3.38 GW.h of actual thermal generation change due to changes in water conditions.

TOPIC: **LWRF annual reports, 2018 preliminary results**

REFERENCE: YEC 2017-18 GRA Compliance Filing Application, Appendix 2.2

QUOTE:

PREAMBLE:

QUESTION:

a) Please confirm that the 2018 LWRF calculations for the LWRF are capped at the 2018 forecast generation level. If not confirmed, please explain.

ANSWER:

(a)

Please see responses to YUB-YEC-1-13, YUB-YEC-1-14, YUB-YEC-1-17 and YUB-YEC-1-20. The 2018 LWRF calculations are not "capped" at the 2018 forecast generation level. As noted in these responses – the Compliance Filing proposals assume that it is necessary, in compliance with paragraphs 321 and 322 of Appendix A for Board Order 2018-10, as well with normal principles established in Canada for utilities, to consider the thermal generation requirement at the **actual** 2018 load in order to determine how much of the change in thermal generation requirements from forecast relates to load growth (utility risk) and how much relates to changes in water conditions (ratepayer risk).