YUKON ENERGY CORPORATION

2017/2018 GENERAL RATE APPLICATION
2nd COMPLIANCE FILING
INTERROGATORY RESPONSES FILED

October 21, 2019

ATCO Electric Yukon
(AEY)

TOPIC: Energy Variance from Test Year Forecast

QUESTION:

a) Please provide a breakdown of YEC's energy variance – test year GRA forecast vs actual – by rate class (including YEC retail customers, YEC Industrial, and Wholesale) for the most recent three years (2016, 2017, & 2018).

ANSWER:

(a)

The table below shows the energy variance for the most recent three years as requested. The 2016 variance reflects change between 2013 GRA approved forecast compared to 2016 actuals [2016 is not a test year in the current GRA]. For 2017, YUB Order 2018-10 approved the GRA forecast at actuals therefore there is no variance for 2017.

YEC Sales Variance from relevant GRA Forecast (MWh)
(2016 variance is from 2013 approved GRA forecast)

	YEC Retail	Industrial	Wholesale
2016	3,418	577	-5,940
2017	0	0	0
2018	3,080	4,717	17,570

The 2018 wholesale sales variance includes an estimated 2,933 MWh increase due to Fish Lake hydro generation being lower that LTA generation.[1] LWRF determinations assess YEC generation net of LTA Fish Lake impact, i.e., the 2018 wholesale sales variance relevant for the LWRF is 14,637 MWh increase.

[1] Fish Lake generation was 5,458 MWh, compared with LTA at 8,391 MWh assumed for the YEC GRA forecast, indicating a Fish Lake generation variance of 2,933 MWh.

TOPIC: Price Signals and Timing

QUESTION:

a) When does YEC anticipate finalizing the LWRF each year?

ANSWER:

(a)

The Yukon Utilities Board in its Order 2015-06 directed YEC to file an application to the Board within 60 days of the fiscal year end for a rate rider if the fund balance is outside of the +/- $8 million range.

In accordance with Board directions, YEC will prepare an annual report within 60 days of the fiscal year end.

Please also see response to YUB-YEC-1-11 (a) and (b).

TOPIC: **Section 7 of O.I.C. 1995/090**

REFERENCE: **Wholesale rates**

7. The Board must fix rates of Yukon Energy Corporation for the wholesale power customer in accordance with the following rate policy for Yukon:

(a) Yukon Energy Corporation shall sell electricity to The Yukon Electrical Company Limited at the same demand rate and the same energy rate throughout the Yukon and those rates must be sufficient to enable Yukon Energy Corporation to recover its costs that are not recovered from its other customers;

(b) the wholesale rate to The Yukon Electrical Company Limited shall include appropriate provisions to ensure that Yukon Energy Corporation will recover its costs for retail and major industrial power service with adoption of the rates for retail power customers and major industrial power customers as specified herein.

QUESTION:

a) Please confirm YEC believes Section 7 of OIC 1995-90 precludes YEC from dispensing/recovering LWRF/DCF/ERA variances from all customers via its own riders. Please explain.

b) If part a) is confirmed, please explain how YEC's shortfall riders – Riders J & J1 – are consistent with this belief.

ANSWER:

(a) and **(b)**

On its face, Section 7 of OIC 1995-90 addresses only the wholesale rates for power that YEC sells to YECL, with the specification that those wholesale rates "…must be sufficient to enable Yukon Energy Corporation to recover its costs that are not recovered from its other customers". YEC is unclear what AEY is asking in this regard. As regards LWRF/DCF riders, YEC has refunded amounts to all retail and industrial customers

through YEC riders as approved by the Board. ERA amounts are addressed as part of the wholesale rates, and therefore involve only YECL/AEY.

YEC has in the past applied shortfall riders applicable to all retail and industrial customers and is not aware of any limitation on so doing again for the 2017/18 GRA. A shortfall rider cannot be applied until after the Board concludes a GRA process – and the implementation of such a rider is designed to enable YEC to recover these costs from retail and industrial customers (and thereby removes any need for YEC to recover such costs from YECL/AEY pursuant to Section 7 of OIC 1995/90).

TOPIC: **Fuel mix**

QUESTION:

a) Please provide YEC's actual LNG: Diesel fuel mix for each of the last three years (2016, 2017, & 2018).

b) Please provide the actual & forecast annual price of LNG for each of the last three years (2016, 2017, & 2018).

c) Please provide the actual & forecast annual price for Diesel for each of the last three years (2016, 2017, & 2018).

ANSWER:

(a)

The LNG: Diesel fuel mix (including generation, maintenance and capital) for each of the last three years was as follows:

	LNG	Diesel
2016	53%	47%
2017	68%	32%
2018	81%	19%

Excluding maintenance, capital and RFID (as required for LWRF determinations), the LNG: Diesel fuel mix was 73% LNG: 27% diesel for 2017, and 83% LNG: 17% diesel for 2018.

(b) and **(c)**

The actual and forecast annual price of LNG and Diesel for each of the last three years was as follows[1]:

[1] Diesel costs reflect weighted average diesel fuel cost per kW.h. 2016 diesel cost forecast is based on 2012/13 approved GRA forecast.

Actual Price ($/kW.h)		
	LNG	Diesel
2016	0.1817	0.2417
2017	0.1782	0.2837
2018	0.1812	0.2829

GRA Forecast ($/kW.h)		
	LNG	Diesel
2016	N/A	0.2871
2017	0.1467	0.2633
2018	0.1467	0.2633

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City of Whitehorse
(CW)

ISSUE/SUB-ISSUE: YECSIM Model

REFERENCE: Notes for Oct 8-19 Technical Session, PDF Page 4 of 22

PREAMBLE: On PDF Page 5 of 22, YEC provides a thermal forecast for three different water levels.

QUESTION:

a) Please confirm that the YECSIM model assumes a random distribution of water levels. If not confirmed, please fully explain.

b) Please fully discuss the impact on the YECSIM model if there is a trend in water levels. As an example, if through climate change there is a trend toward higher or lower water levels, what would the impact be on the use of a long-term average? In the response, please fully discuss how the probability of droughts may change.

ANSWER:

(a) and **(b)**

The YECSIM model features were the subject of earlier review in the current proceeding, and are not the focus for current LWRF review. Please see the YEC ERA Filing – Part 1 and 2, filed December 6, 2017 and in particular Appendix 2.4 on the YECSIM model.

YECSIM is a simulation model and as such does not assume any random distribution of water levels. As stated in Appendix 2.4: "YECSIM is a simulation model[1] developed specifically for Yukon Energy by a third-party engineering firm (KGS Group) to evaluate operational alternatives in terms of energy generation (hydro, thermal), environmental

[1] Simulation is an approach in a decision-making process that evaluates a large number of alternatives defined by decision-makers and presented to the model for evaluation. Simulation models can be used to measure the performance of alternatives under considerable flexibility and a high degree of realism supplied by decision-makers. This method requires decision-makers to have comprehensive knowledge of the topic to ensure the correct selection of a single option from a potential field of options. It provides an insight into potential outcomes using a variety of predefined conditions.

flows downstream of lakes, and lake elevations.[2] For 2017-18 GRA purposes, YECSIM has been used to determine LTA or expected hydro and thermal generation (over 35 water years of record) for forecast grid loads and current generation capabilities."

Given the reliance on historic water year data, simulation models of this type do not address trends in water levels beyond what is captured in the historic data. Such models also do not address potential wider ranges for water changes that may be evident from other factors such as the study of tree rings or other historic data beyond the 35 year official water record. Modelling assessments continue to use historic water year records for planning and LTA assessments as the best available data for new resource planning assessments – and this same data is therefore of continued relevance for LTA assessments used for current utility rates and the current LWRF determinations.

[2] Appendix 3.4 of the 2017-18 GRA provided updated information on YECSIM assumptions and use for the current GRA, including Attachment 3.4.3 information on the model itself. As reviewed in Attachment 3.4.3 of YEC's 2017-18 GRA, the simulation model develops expected hydro plant capabilities for each load forecast scenario. It reviews, by week, information for available "water years" of record (2017-18 GRA forecasts used 35 water years, 1981-2015) and simulated hydro generation for a specified grid load over the range of all possible sequence combinations (cycles) of the water years. The long-term average thermal energy generation estimates as provided by YECSIM reflect averages of widely varying annual water flow conditions, and the long-term average thermal energy generation estimate varies as YEC grid loads vary. Hydro generation in any one year can vary greatly from the long-term average estimated.

ISSUE/SUB-ISSUE: **Impact of company decision on water levels**

REFERENCE: **Notes for Oct 8-19 Technical Session, PDF Page 3 of 22**

PREAMBLE: While the use of an LTA may make sense in principle, the CW requires information to assess the possibility of management decisions influencing the LTA.

QUESTION:

a) Please fully discuss the impact of company management decisions on water levels and the need for hydro. As an example, how would changes in maintenance schedules impact the availability of hydro generation, and the need for thermal generation, and impact the LTA?

b) Please fully discuss how the selection of any minimum water levels and forecast of water levels for the remainder of any particular season impact the LTA.

c) Please fully discuss the controls in place to ensure that management decisions cannot impact the actual water levels and the amounts collected from, or paid to the LWF.

ANSWER:

(a), (b) and **(c)**

Issues related to YECSIM, LTA assessments and LWRF determinations being impacted by management decisions were extensively addressed in the current proceeding, and are not the focus for the current LWRF compliance filing review.

Calculation of the LTA is determined by YECSIM model assessments as described in detail during the proceeding. In response to questions (a-b) above, actual management decisions during any specific year on any matters referenced do not affect the YECSIM simulation to determine the LTA. The extensive prior evidence during the current proceeding addressed question (c) issues of management actions affecting actual thermal

generation in any actual year – and any concerns that such actions might adversely impact LWRF determinations.

In summary, as indicated in response to various IRs[1] and Yukon Energy's rebuttal of the City of Whitehorse (CW) Evidence (Exhibit B-21), the LWRF as proposed (and earlier DCF and LWRF's) provides a reasonable basis to separate thermal generation cost variance due to water availability outside management control (to be borne by ratepayers) from thermal generation cost variance due to changes in total grid load (to be borne by the utilities). YEC submissions in these IR responses have been clear that water availability outside management control (i.e., the risk to be borne by ratepayers) applies to all grid load supplied by YEC, including thermal generation cost variance due to water availability that applies to changes in total grid load from approved GRA forecasts – and that this principle is consistent with past YUB decisions as well as principles adopted by utilities in Canada as reviewed in IR responses.

Where feasible, YEC's evidence has shown that the LWRF also addresses all potential operational risks that could affect thermal generation risks.

The LWRF removes specific non-water-related thermal operation risks, e.g., risks related to Reserve for Injuries and Damages (RFID) events, capital projects, thermal unit fuel efficiencies, and (as proposed for the first time in the present Application) thermal generation maintenance and run-up requirements.

YEC is not aware of any consistent and reasonable way to isolate additional items, such as operation risks related to use of water for hydro generation to the extent that these may impact thermal generation costs.[2] Such isolation has not been attempted in either the earlier Low Water Reserve Fund (LWRF) or the earlier DCF. Further, as noted in the response to YUB-YEC-1-6(b) (ERA Part 1 Application), YEC has well established systems to monitor its use of available water, and is not aware of any material impacts on the effectiveness of LWRF or DCF determinations related to the water management element of its systems' operation.

Please also see response to YUB-YEC-1 in review of the February 2019 compliance filing.

[1] For example: AEY-YEC-2-1, YUB-YEC-2-14(b-c) and YUB-YEC-2-16(a-b) in this proceeding, and YUB-YEC-1-5 and YUB-YEC-1-6(b) in the ERA proceeding.
[2] YUB-YEC-2-16(b) and YUB-YEC-2-14(b-c).

ISSUE/SUB-ISSUE: LNG Fuel Mix

REFERENCE: Notes for Oct 8-19 Technical Session, PDF Page 20 of 22

PREAMBLE:

YEC discusses a Diesel/LNG fuel mix of 90:10.

QUESTION:

a) Please fully discuss the environmental impact of each of diesel and LNG.

b) Please fully discuss the possibility of alternate fuels such as wind or solar to replace fossil fuels.

c) Please provide the maximum diesel/LNG fuel mix, if LNG were used to the maximum.

ANSWER:

(a) and **(b)**

Questions (a) and (b) are beyond the focus of LWRF issues related to the current compliance filing, or issues addressed in the referenced document. YEC's 2016 Resource Plan, as filed in the current proceeding, reviewed air emission impacts of diesel and LNG as well as potential future opportunities to develop alternative renewable generation resources such as wind, hydro, geothermal of solar to replace fossil fuels.

(c)

YEC seeks to maximize LNG use versus diesel whenever this is practical and reasonable, given that LNG results in lower utility costs as well as lower GHG emissions than would occur with diesel use.

LWRF determinations relevant to the current proceeding must be consistent with the hydro and generation forecast assumptions as to water availability as approved for the last test year forecast, i.e., the LTA thermal generation forecast as approved for the 2018 test year.

The GRA forecast assumes that a practical and reasonable maximum LNG use for LTA generation is 90% LNG and 10% diesel. As reviewed during the oral proceeding, YEC did not have any specific "statistical" basis for deriving this 90/10 forecast split,[1] beyond reference to the LTA thermal generation being driven by a small share of the 35 water years with low water conditions.[2] YEC will review the LNG/diesel split in each future GRA as more experience is gained and as new loads and generation resources affect the grid.

[1] See Osler TR; 280:21 to 281:15 where it was also suggested that the 90/10 split be reviewed in each GRA.
[2] At forecast conditions representing forecast and actual 2017 grid loads (i.e., grid loads of 420 to 450 GW.h/year as reviewed in Appendix 3.4 of Exbibit B-1 at page 3.4-23), 51% to 75% of the LTA thermal generation occurs in the 20% of the 35 water years with the worst drought conditions. On this basis, it was concluded that 90% LNG share of LTA was reasonable as a forecast.

Utilities Consumers' Group
(UCG)

TOPIC:

REFERENCE: YEC Technical Session – Background Notes – Page 5

QUOTE:

PREAMBLE:

In the Average Annual Thermal Generation table for 1981 to 2015, YEC lists average thermal generation levels at 420 GWh, 380 GWh and 450 GWh load levels.

QUESTION:

a) Please provide similar tables for 1981 to 2015 and 1983 to 2018 showing the load levels split into two columns such that the actual mine load is isolated in its own column.

ANSWER:

(a)

The requested information is outside the scope of the current proceeding. The Board provided its directions on revenue requirement and revenue issues for the 2017 and 2018 test years in Order 2018-10 and Order 2019-04 and Yukon Energy's 2nd Compliance Filing addresses these directions. The only remaining issues relate to the LWRF - and LWRF determinations do not affect revenue requirement or revenues.

TOPIC:

REFERENCE: YEC Technical Session – Background Notes – Page 12

QUOTE:

PREAMBLE:

YEC provided a summary of the four-step process used to determine the functioning of the 2018 Low Water Reserve Fund (LWRF) deferral account.

QUESTION:

a) Please provide details of any other generation experts or academics that YEC has consulted regarding the method used to determine the LWRF.

b) Please provide details of any outside review conducted of YEC's calculations.

c) Please confirm how YEC determines "material changes" that would require a recalculation of the thermal generation due to water level variation.

d) Please confirm that in future GRA filings, YEC will be providing an analysis which compares its forecasts of hydro and thermal generation used to set rates for previous years with the actual generation results for those years with full explanations of the drivers of any variances.

ANSWER:

(a) and **(b)**

The four steps shown are from directions in Board Order 2019-04 as to how the LWRF is to be determined. Aside from Step C, the Board has determined the methods used for each step – and YEC has explained the methods used for Step C, which in effect include the LTA as approved by the Board and proposed sub-steps to estimate actual thermal generation as directed by the Board. These methods are not excessively complicated and are fully explained by the filing.

Methods to determine LWRF and/or DCF have been ongoing in YUB proceedings since the early 1990s. YEC has not consulted other generation experts or academics during this period on these issues, nor has YEC retained outside reviews of its calculations. Outside expertise used for YECSIM model development has been reviewed during the proceeding.

(c)

The issue of determining material changes was addressed in prior IRs, including IRs on the first compliance filing. Please see April 9, 2019 response to YUB-YEC-1-15 (a-c).

(d)

YEC will comment in future GRAs on the extent that hydro and thermal generation varied from LTA. As reviewed in the current proceeding at some length, LTA and short-term hydro and thermal generation forecasts differ material – and LTA forecasts are not intended to forecast actual hydro or thermal generation in any test year.

TOPIC:

REFERENCE: YEC Technical Session – Background Notes – Page 15

QUOTE:

PREAMBLE:

YEC provides summaries of four water and load level scenarios and the resulting Low Water Reserve Fund (LWRF) determinations.

QUESTION:

a) Please identify any other methods that YEC has considered to fund the LWRF.

b) Please identify alternatives to the LWRF that could be used to address the same issues.

c) Please confirm that YEC can control when load is added to the system so as to minimize adverse impacts on cost drivers like thermal generation.

d) Please describe the impact that YEC's operating policies have on the mix of thermal generation actually used.

ANSWER:

(a) and **(b)**

Methods considered to fund the LWRF and alternatives to the LWRF were addressed in detail during the 2017/18 GRA and in earlier proceedings.

Section 2.5 of Yukon Energy's Two-Part Application Regarding Energy Reconciliation Adjustment ("ERA") (December 6, 2017) reviewed issues and alternatives for the period 2017 forward.

UCG-YEC-2-17 filed during the 2017/18 GRA notes Yukon Energy is aware of the use of deferral accounts that deal with variances between forecast and actual costs; Yukon

Energy is also aware of jurisdictions were deferral accounts are used to track variances between forecast and actual costs of generation. YEC has reviewed, in past proceedings on the DCF and ERA, the range of such mechanisms in other hydro-electricity jurisdictions in Canada that address cost impact issues related to water variance versus load variance impacts from GRA forecasts. None of these alternatives have been considered to be reasonably applicable to the requirements as they have evolved in this Yukon jurisdiction.

Please also see response to YUB-YEC-2-9 and YUB-YEC-2-31 from the 2017/18 GRA. YUB-YEC-2-9 reviews the context and approaches used in other hydro-based Canadian jurisdictions (outside of Quebec). See also, the response to YUB-YEC-2-3(c) which reviews the historic context going back to 1989/90 for the development of contingency fund mechanisms in Yukon to address water variability risks borne by ratepayers. YUB-YEC-2-9(e) Attachment 1 provides YEC's Rebuttal Evidence from the 2014 DCF/ERA Proceeding. This Rebuttal Evidence reviewed the Yukon context for the DCF and reviewed other rate stabilization mechanisms used in Northwest Territories, Manitoba, Newfoundland and Nova Scotia.

(c)

Not confirmed.

Yukon Energy has an obligation to serve both non-industrial and industrial loads that are able to connect to the integrated grid. Yukon Energy is considered under the *Public Utilities Act* to have a typical utility obligation to serve new customers that request electrical service where these customers locate within areas presently served by Yukon Energy grid power.

(d)

The impact of operating policies on the mix of thermal generation actually used has been reviewed in detail during the 2017/18 GRA. Please see response to CW-YEC-1-2 (a-c) in this proceeding which reviews in summary the evidence provided.

TOPIC:

REFERENCE: **YEC Technical Session – Slide Presentation – Slide 6 - Rate Setting**

QUOTE:

PREAMBLE:

YEC states that rates are established based on generation forecasts that make some assumption about water conditions.

QUESTION:

a) Please confirm whether current rates charged by YEC are based upon short-term or long-term generation forecasts.

b) Please identify the benefits and drawbacks of both the short-term and long-term generation forecast methods and which method results in ratepayers carrying additional risk.

c) Please confirm that the short-term generation forecast method is more accurate.

d) Please provide details of the YUB's reasons for deciding which generation forecast method to use for rate setting.

ANSWER:

(a)

Board Order 2018-10 and 2019-04 approved the use of long term average generation forecasts for the 2017/18 GRA.

(b) to **(d)**

These matters were canvassed and addressed extensively during the 2017/18 GRA process.

In response to Board direction, Yukon Energy's Two Part ERA Application provided a ST Alternative GRA Forecast for 2017 and 2018. It also included an assessment of adopting ST versus LTA hydro forecasts for GRA purposes. These alternatives were reviewed in round 2 of the 2017/18 GRA IRs. See for example responses YUB-YEC-2-11 through 25. See also Yukon Energy's Final Argument for the 2017-18 GRA, pages 11-12.

In summary, the evidence showed that discontinuing an LWRF based on forecast LTA water conditions for the 2017 period forward, and instead relying on ST water condition forecasts and a related ST contingency fund mechanism (that would need to be developed) would:

- Increase rate instability;
- Mask, rather than display, the expected long-term cost of power; and
- Frustrate, rather than facilitate, intergenerational equity and fair treatment related to the benefits provided by hydro generation over its long-term economic life.[1]

The volatility of ST hydro and thermal generation forecasts was demonstrated during this proceeding by the ST versus actual thermal generation for 2017.[2]

- Based on November 29, 2016 reservoir levels and GRA forecast loads, the 2017 ST forecast thermal generation to supply loads was 1.1 GWh with 2017 forecast fuel cost of $0.320 million (including maintenance at $0.102 million and an assumed 60/40 LNG/diesel split for the ST).[3]

[1] Several of the referenced IRs address rate instability impacts of ST versus LTA forecasts. YUB-YEC-2-13 specifically reviews issues related to price signals and intergenerational equity and fair treatment as regards ST versus LTA hydro forecast use for setting rates.
[2] See Mr. Osler TR;643:22 to 645:3 which also noted that the ST forecasts used for GRA purposes are not what YEC operators would rely upon for system operation.
[3] Exhibit B-14, page A2.2-1 and 3.

- Taking into account the much higher actual grid load for 2017, the 2017 ST forecast thermal generation fuel cost forecast increased by 236% to $1.076 million (including maintenance cost and the same assumed 60/40 LNG/diesel split for the ST, indicating an updated ST forecast thermal generation slightly in excess of 5 GW.h).[4]

- Actual thermal generation in 2017 to supply grid load was slightly over 13 GW.h with a fuel cost of approximately $2.3 million[5] – well above the updated (let alone the initial) ST forecast, reflecting (among other factors) low water conditions at Mayo hydro facility, but still below the LTA thermal generation of 27.1 GW.h as updated for the final grid load.[6]

- Overall, a ST forecast for 2017 would have required a payment to YEC from the DCF - while the LTA forecast approach resulted in YEC paying into the DCF.

Review of 2018 updates highlighted additional volatility for use of ST versus LTA hydro and thermal forecasts for the second GRA test year.[7]

In conclusion, the evidence highlighted the advantages of continuing the use of LTA as a fair and balanced approach for both the utility and ratepayers, and the material disadvantages of using ST forecasts – including evidence that available ST forecasts for a GRA proceeding are not more accurate or reliable than LTA forecasts.

Overall, the issue of thermal generation forecast "accuracy" for specific test years is also not the real issue to address in selecting LTA versus ST forecast options. Traditional principles have sought to secure rate stability over the life of hydro assets versus high volatility in response to actual water conditions – and the LTA option is clearly more consistent with these traditional principles.

[4] Response to Undertaking #35 as filed July 20, 2018; Attachment 1, schedule 10, line 12.
[5] See DCF 2017 Annual Report as provided with Exhibit B-20, revised UCG-YEC-2-39, Attachment 1, line 17; see also CW-YEC-2-1 revised.
[6] Ibid, line 16.
[7] See response to Undertaking #36 Revised as filed July 23, 2018 which shows ST forecast fuel cost for 2018 ranging from $1.8 to $3.6 million depending on the assumed load forecast for 2016 and 2017.

TOPIC:

REFERENCE: **YEC Technical Session – Slide Presentation – Slide 8 – LTA Determination**

QUOTE:

PREAMBLE:

QUESTION:

a) Please explain how any changes to a water licence would drive changes in the YECSIM model.

b) Please explain what changes will be required in YEC's modelling with a functioning Independent Power Production (IPP) policy in place within the Yukon. Please elaborate on what levels of IPP would drive changes to YEC's modelling.

ANSWER:

(a)

The YECSIM model incorporates the operation rules and license requirements that specifically apply to each site. This includes minimum flow requirements for each river, and each segment of the river when the requirements change along the same water course, as well as the maximum and minimum levels of operation of each lake in the system, in accordance to the license.

When there is a change in water license requirements that change is also reflected in the YECSIM model. As the result, the changes in the model impact the long-term average hydro and thermal generation results depending on change in license requirements. For example, if the water license change reduces water storage volume then hydro generation reduces and thermal generation increases accordingly.

Please also see April 9, 2019 response to YUB-YEC-1-15(a-c).

(b)

The YECSIM model is a planning model that is designed to provide an accurate representation of the YEC power system and has been used to assess thermal generation requirements under long-term average water conditions at a particular load level and complex rules of operation and the regulatory demands on YEC. The model represents the YEC hydraulic power system, i.e., the hydraulic generation stations owned and operated by YEC, including the operation rules and license requirements that specifically apply to each site based on existing water licenses.

In addition, the YECSIM model must address non-dispatchable generation resources (e.g., wind or run-of-river hydro) as deductions from the forecast load prior to the YECSIM assessments.

It is expected that IPPs will be non-dispatchable generation. Therefore, the IPPs will be reflected in the YECSIM model runs similar to the wind generation where the model inputs will be adjusted to reflect IPP generation volumes that are expected to be delivered to the Yukon Grid.

As reviewed in the April 9, 2019 response to YUB-YEC-1-15, any addition or change to YEC's generation resources is expected to be treated as a material change for YECSIM model and LTA assessments. This would apply as well to any IPP connections.

TOPIC:

REFERENCE: **YEC Technical Session – Slide Presentation – Slide 13 – LWRF Impacts**

QUOTE:

PREAMBLE:

QUESTION:

a) Please provide details of actual generation by source by month for 2018 and 2019 year to date.

b) Please provide details on how actual water levels in 2018 and 2019 to date have affected actual levels of thermal generation in 2018 and 2019 to date.

ANSWER:

(a) and **(b)**

The requested information is outside the scope of the current proceeding. The first compliance filing in February 2019 provided 2018 preliminary actuals for the year for total generation and for thermal generation (see Appendix 2.2), and the October 8, 2019 Technical Session reviewed actual results for 2018 relative to GRA forecasts and LTA hydro.

TOPIC:

REFERENCE: YEC 2nd Compliance Filing – Page 1-1

QUOTE:

PREAMBLE:

"For 2017, YEC has included new YEC debt of $23.828 million and interest expense at $0.512 million; this equates to 2.15% interest. When combined with pre-existing debt which has various rates depending on market conditions at the time the debt was secured, the total debt rate for each test year is 2.40% for 2017 and 2.23% for 2018.

In summary, beyond providing clarifying information on this matter, there is no basis for YEC to change the overall mid-year long term debt interest costs for 2017 and 2018 from what was included in the first Compliance Filing."

QUESTION:

a) Please confirm that in its Order 2018-10 - Reasons for Decision, the YUB accepted the forecast market rate for YEC's total cost of debt of 2.15% for each of the 2017 and 2018 test years.

b) Please provide details of where the YUB has directed YEC to determine a total debt rate for 2017 and 2018 that is any different from the allowed 2.15%.

ANSWER:

(a) and **(b)**

Yukon Utilities Board ("YUB") in its Order 2018-10 approved an interest rate of 2.15% for the <u>new</u> long-term debt issued in the 2017 and 2018 test years as proposed by YEC in the original application. YEC's compliance filing continued using an interest rate of 2.15% for the new long-term debt issued in the 2017 and 2018 years in accordance with the YUB approval. The overall total long-term debt cost for each test year also includes interest on debt secured prior to 2017, and therefore this total debt rate is higher than 2.15% for each test year.

The percentages referenced in the preamble, 2.40% for 2017 and 2.23% for 2018, reflect weighted average cost of debt rates for the test years based on mid-year balance of the total long-term debt balances combined with pre-existing debt which has various rates depending on market conditions at the time the debt was secured and as approved by the YUB in the previous GRA applications. Please see Schedule 11 of Tab 7 in the compliance filing for list of long-term debt issues with interest rates (including new long-term debt with 2.15% interest rate as per YUB approval in the 2017/18 GRA) as well as calculation of the weighted average cost of debt at 2.40% and 2.23%.

TOPIC:

REFERENCE: YEC 2nd Compliance Filing – Page 1-2

QUOTE:

PREAMBLE:

"The Board determined that YEC's Low Water Reserve Fund (LWRF), its calculations and associated term sheet are not compliant with the directions of Board Order 2018-10 and are not approved; YEC was directed to revise its LWRF in accordance with the Board's findings in this decision in a second compliance filing with the Board.

This direction is addressed in this Compliance Filing through revisions to Appendix 2.1, and the required changes do not have any impact on the test year revenue requirement, the proposed rates, or other matters included in the Compliance Filing. Yukon Energy will file Appendix 2.2 (LWRF 2017 and 2018 Annual Reports & ERA 2017 and 2017 Filing) with the Board after Board final approval of the LWRF is provided."

QUESTION:

a) Please provide details on why changes to the LWRF will not impact the revenue requirements for 2017 and 2018.

ANSWER:

(a)

Please see October 9, 2019 Technical Session, YEC Presentation – Background Notes, pages 1 to 4.

- As shown in the figure at page 1, GRA decisions on rates determine thermal generation forecasts related to assumed water conditions – and the Board has now provided its directions regarding the revenue requirements for 2017 and 2018 in Board Order 2018-10 and Board Order 2019-04. Based on Board Order 2019-04, YEC understands that the 2017 and 2018 final revenue requirements have also now been determined.

- For 2018 (the only test year subject to LWRF determinations), the Board's decision included an LTA thermal generation forecast, and the assumed 90/10 LNG/diesel fuel mix for the LTA thermal generation forecast.

- LWRF determinations for 2018 must occur post GRA and therefore do not affect GRA decision regarding test year revenue requirements for 2017 and 2018.

- Decisions affecting interim rates are affected by the extent of delays in securing final test year GRA decisions, and therefore interim true-up rates may be affected by the timing required to finalize Board decisions – but this factor by itself has no impact on approved revenue requirement for 2017 and 2018 test years.

TOPIC:

REFERENCE: YEC 2nd Compliance Filing – Page 1-4

QUOTE:

PREAMBLE:

Table 1.1 - Summary of Changes to the Revenue Requirement and Revenues at Existing Rates.

QUESTION:

a) Please confirm that the revenue requirement and sales / revenues at existing rates for 2017 and 2018 represent actuals for those years. If not, please provide an updated Table 1-1 showing actuals for 2017 and 2018.

ANSWER:

(a)

The requested information is outside the scope of the current proceeding. The Board provided its directions on revenue requirement and revenue issues for the 2017 and 2018 test years in Order 2018-10, including the extent (if any) to which actuals were to be used, and Yukon Energy's 1st Compliance Filing in February 2019 addressed these directions. Yukon Energy's 2nd Compliance Filing in response to Board Order 2019-04 made no changes to Table 1.1 as filed in February 2019. The only remaining issues relate to the LWRF - and LWRF determinations do not affect revenue requirement or revenues.

TOPIC:

REFERENCE: YEC 2nd Compliance Filing – Page 1-7

QUOTE:

PREAMBLE:

YEC notes that Order 2018-10 directed that the operation of the Diesel Contingency Fund (DCF) / Low Water Reserve Fund (LWRF) be made less complex.

QUESTION:

a) Please explain how YEC believes it has made the operation of the LWRF less complex than the previous DCF.

ANSWER:

(a)

This was addressed in the February 25, 2019 Compliance Filing. Appendix 2.1, page 2.1-2 notes that "the DCF's complexities occur in separating out the share of this variance between actual and forecast thermal generation that is due to variance in actual versus GRA assumed water conditions. 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." The LWRF Term Sheet included a Fixed Change Factor to simplify the determination of LTA forecast thermal generation at actual YIS load for any fiscal year.

Please also see response to YUB-YEC-1-1 in the current round of IRs.

TOPIC:

REFERENCE: YEC 2nd Compliance Filing – Page 1-11

Order 2018-10: Reasons for Decision – Page 63

QUOTE:

PREAMBLE:

In its September 23, 2019 compliance filing, YEC has requested the following final approvals:

1. Approval to set an ongoing Rider J at 22.32% for retail customers and 18.67% for industrial customers, effective October 1, 2019 if this Rider J rate is approved on or before September 27, 2019, and otherwise effective November 1, 2019, applicable to all YEC and AEY firm retail and industrial rates, including fixed Rider F and fixed monthly payments for major industrial rates (all AEY recoveries from this rider would flow through to YEC).

2. Approval to set a time-limited Rider J1 to be in effect the same date that the above Rider J is effective, and to continue for 24 months, with Rider J1 at 8.76% if effective October 1, 2019 and at 8.99% if effective November 1, 2019, and applicable to all YEC and AEY firm retail and industrial rates (all AEY recoveries from this rider would flow through to YEC), to collect the remaining 2017, 2018 and 2019 net revenue shortfall as well as required Rider F adjustments for 2017, 2018 and the first six months of 2019. Effective 24 months after starting (that is, at either September 30 or October 31, 2021), Rider J1 would be set to zero.

PREAMBLE:

"319. Given the isolated nature of the Yukon environment, the ramifications that low water events can have on electricity prices and the need to mitigate those impacts, the Board finds that a DCF-type of mechanism is required."

QUESTION:

a) Please explain how common it is to expect a regulator to review and approve requested rate riders within 4 days of a utility's compliance submission.

b) Please describe how ratepayers will be advised in advance of the rate riders being added to their bill at the start of the 2019/2020 heating season.

c) Please provide detailed calculations of the total bill (including all proposed and taxes) for a residential customer in Whitehorse using 800 kWh, 1000 kWh, 1200 kWh and 1400 kWh per month in January 2016, January 2017, January 2018, January 2019 and January 2020. Please provide details of the bill calculations and indicate overall percentage changes in the total bill for each year.

d) Please explain how the significant impact of the proposed rate riders on ratepayers' bills entering the most expensive time of year for electricity will be mitigated.

ANSWER:

(a)

Following Yukon Energy's 2012/13 General Rate Application, Yukon Energy issued its 2nd Compliance Filing on June 20, 2013. The Board issued Order 2013-14 approving this compliance filing on June 24, 2013 for rates that then became effective July 1, 2013. It is important to note that this fast implementation reflected the completion of an earlier 1st compliance filing and implementation of a few specific changes as directed by the Board.

As noted in the September 23, 2019 Compliance Filing, none of the changes resulting from Board Order 2019-04 affected the revenue requirement or proposed rates included in the first Compliance Filing, i.e., the only change for rates from the first Compliance Filing relates to adjusted true-up amounts and related rate riders required due to delay in finalizing the 2017-18 GRA revenue requirements and final rates.

More specifically, required changes to the LWRF do not affect the test year revenue requirement, the proposed rates or other related rate matters included in the first or second

Compliance Filing. Yukon Energy had requested the revenue requirement and rates be approved on or before September 27, 2019 in order to enable rates to become effective October 1, 2019 and thereby prevent further added true up cost impacts on final rates. It was noted that should the Board require additional time to review the proposed changes to the LWRF, YEC proposed that such matters could be addressed separately so as not to further delay approval of final 2017/18 rates and riders.

(b)

Ratepayers will be advised directly when the bill is issued. Opportunities for prior notification, beyond public notices, are constrained by the timing of any final Board approval decision.

(c) and **(d)**

Please see response to UCG -YEC-1-3 provided on September 22, 2017 (Tables 1-1 through 1-4) that shows bill impact for the residential customers with different energy consumptions as requested in the Information Request, including impact of interim increase to Rider J effective September 1, 2017.

Since that time there has been no changes in YEC's base rates. Based on YUB Orders 2018-10 and 2019-04 on YEC's 2017/18 GRA, calculated final Rider J is 22.32% which would results in $7.91/month increase in monthly bill for residential customer that uses 1,000 kW.h/month [$6.50/month for 800 kW.h/month; $10.81/month for 1,200 kW.h/month and $13.71/month for 1,400 kW.h/month consumption].

Due to delay of the implementation of the final rates there also would be a true-up rider which YEC can only finalize at the time of final submission that is currently expected to be on November 4, 2019.

YEC has proposed a two year interim true-up rate period, rather than the normal one year period, in order to mitigate the impact of the true-up rider required due to the timing of final rate decisions and the low level of the interim rate riders approved during the extended 2017-18 GRA proceeding period.

TOPIC:

REFERENCE: YEC 2nd Compliance Filing – Attachment 2.1-1: LWRF Term Sheet

QUOTE:

PREAMBLE:

QUESTION:

a) Please confirm that the annual and quarterly reports regarding the LWRF calculations and LWRF balance updates to be provided to the YUB can be provided to intervenors of this proceeding and made available on YEC's web site for the public to view.

b) Please provide details of the current balance of the LWRF (based on transfers from the DCF) and how the current balance would be impacted by the proposals in this compliance filing.

c) Please provide an update to Table 2.1-2 (LWRF Operation Example for 5 Forecast Years) starting with the actual LWRF balance in January 2018 and YEC's best estimates of the actual operations of the LWRF between 2018 and 2022.

d) Please provide versions of Table 2.1-1 (Example LWRF Determination) that change the Fixed Change Factor of 45.3% to 38%, 40%, 43% and 50%.

e) Please explain the pros and cons of using a Fixed Change Factor versus the term sheet calculations.

ANSWER:

(a)

These reports will be filed with the Yukon Utilities Board. Prior reports have been made available on the Board's website and it is expected that future reports would continue to be available on the Board's website. Please see link below:

http://yukonutilitiesboard.yk.ca/reports/

(b)

The balance at December 31, 2017 is $6.710 million as reported in Appendix 2.2 of February 25, 2019 Compliance Filing (Attachment 1, Table 2).

The February Compliance Filing estimated a 2018 transfer to YEC of $0.894 million, and interest on the 2018 balance of $0.076 million. Final LWRF transfers for 2018 have not yet been determined by the Board (YEC's current estimate based on Board Order 2019-04 is a transfer of $0.846 million).[1]

Rider E rebates for 2018 and Q1 2019 totalled $3.727 million. Board Order 2019-02 ended Rider E rebates as of April 1, 2019.

Final LWRF transfers for 2018 will be determined when the Board approves the LWRF. Therefore, YEC is unable to determine a final fund balance to the current date. Based on YEC's current estimate for the 2018 LWRF transfer, the LWRF balance as at March 31, 2019 would be $2.213 million.

(c)

The information being requested is beyond the scope of the current proceeding and cannot be provided. Table 2.1-2 was only provided as an illustrative example, and was never intended to reflect forecasts or future year conditions that might be reasonably expected. Any estimates of actual operations would require forecasting water conditions over the period. YEC is not aware of any credible model for forecasting water conditions beyond 12-18 months in the future.

[1] The October 8, 2019 Technical Session used a simplified example that indicated $0.922 million for the 2018 LWRF transfer to YEC. The actual final year end numbers differ slightly such that using the methods set out in the Technical Session with Board Order 2019-04, the LWRF transfer is $0.846 million for 2018.

(d)

YEC has no basis to change the Fixed Change Factor in Table 2.1-1 as requested, given that this table is intended to reflect 2018 LWRF determination based on available information.

(e)

Please see response to YUB-YEC-1-7 for a detailed review of options with the Fixed Change Factor versus the LWRF term sheet approach as used in the past. Either option is acceptable to YEC as a simple approach to implementing the LWRF. The term sheet approach is more accurate in addressing updated LTA thermal generation for actual loads that vary from the GRA forecast load – however, if the sole LWRF requirement is to use the actual load LTA thermal generation to estimate actual thermal generation at the forecast load, the Fixed Change Factor may be a more accurate approach (simply because it avoids considering how LTA thermal percent of incremental load rises as load increases).

TOPIC:

REFERENCE: YEC Technical Session – Background Notes – Page 8

YEC 2nd Compliance Filing – Footnote, page 1-6

QUOTE:

PREAMBLE:

The table provided for the technical session indicates hydro and thermal generation levels at various grid load levels. For example, at YEC grid load of 420 GWh, the hydro generation is assumed to be 403.769 GWH and the thermal generation would be 16.231 GWh. This appears to be the same data provided in Table 2.1-4 on page 2.1-4 of the 2nd Compliance Filing that incorporates a Minto load shape change.

PREAMBLE:

The lower 2018 Minto load used for the Compliance Filing reflects a sharp decline in about mid-year for the balance of the year, versus the Application forecast which was reasonably flat throughout the year.

QUESTION:

a) Please provide an updated table reflecting the actual Minto mine load for 2018.

b) Based on YEC's discussions with the Minto mine, please confirm that proven and probable reserves give the Minto mine an estimated four more years of production.

c) Please explain how the load identified for Minto (16,391.7 MWh in 2019 and 18,000 MWh in 2020) in Table 1.1-7 in the Compliance Filing qualifies Minto as a Rate Schedule 39 (Industrial Primary) customer that is required to have an electricity demand in excess of 1,000 kW.

d) Please provide an update to Table 1.1-7 in the Compliance Filing based on current industrial sales in 2019 through 2021.

ANSWER:

(a)

As reviewed below, there is no basis in this proceeding to "update" Table 2.4-1 for the actual Minto load in 2018.

Table 2.4-1 from the original compliance filing (which was copied at page 8 of the October 8, 2019 Technical Session, YEC Presentation – Background Notes) was provided for the 2018 GRA LTA thermal generation forecast. It reflected the best information that was available for YEC at the time of preparation of the compliance filing based on YUB Order 2018-10, paragraph 46. Board Order 2019-04 indicated that the 2018 GRA thermal generation forecast as derived from Table 2.4-1 has now been approved by the Board.

The LWRF Term Sheet that is currently being reviewed only allows for updates to Table 2.4-1 to address material changes in LTA hydro system capability due to changes in loads, installed capacity, licensing/ permits or other factors.

Changes in grid load volumes within the range addressed in Table 2.4-1 do not constitute a material change, i.e., the fact that Minto's actual sales were 36.91 GWh versus 32.19 GWh in the compliance filing forecast (see AEY-YEC-1-1) does not constitute any material change for 2018 LWRF determinations. As regards the seasonal shape of Minto's 2018 load, the following are noted:

- The compliance filing forecast expected this load to decline sharply to care and maintenance mode requirements starting from July of 2018.

- Actual Minto load did in fact decline sharply to care and maintenance mode requirements starting in late October of 2018.

- The delay in the occurrence of this sharp load decline occurred over the July to mid October period, i.e., a period when load changes of 1.1 to 1.5 GWh/month at 2018 loads do not materially change LTA thermal generation requirements.

In summary, the final Minto load for 2018 did not result in any material change as regards Table 2.4-1, and therefore updating Table 2.4-1 for the actual 2018 Minto load is beyond the scope of the current proceeding.

(b) and **(d)**

Table 1.1-7 in the September 2019 Compliance Filing reflects the most recent available information on industrial load. YEC does not have any updated information from Minto that confirms a load forecast other than that shown in Table 1.1-7.

(c)

The Minto mine load as referenced would continue to be above 1 MW. OIC 1995/90 defines a major industrial customer as "a customer engaged in manufacturing, processing, or mining, whose peak demand for electricity exceeds 1 MW, but it does not include an isolated industrial customer."

TOPIC:

REFERENCE: YEC 2nd Compliance Filing – Page 2-2

QUOTE:

PREAMBLE:

"In response to Directive #2, prior to the next GRA YEC will endeavour to consult with AEY on a fulsome basis with respect to sales forecast methodology. YEC believes that the use of different methodologies can provide a more robust approach to testing sales assumptions and ultimately will result in better forecasts. Regardless, YEC will review its methodology to align its forecasts where reasonable and feasible with AEY's forecasts (particularly where such forecasts in an AEY compliance filing have been approved by the Board). YEC notes that for the 2017 and 2018 test years actual wholesales have been considerably higher than GRA forecasts provided by both AEY and YEC."

QUESTION:

a) Please explain how YEC will determine the reasonableness of its wholesale sales forecast.

b) Please explain how YEC will refine its methodology to ensure its forecasts align closely with AEY's forecasts in future GRA submissions.

c) Please provide a table comparing YEC and AEY's wholesale sales forecasts with actuals for 2015 through 2018.

d) Please confirm that, effective January 1, 2019, the Rate Policy Directive does not contain any restrictions on how rates can be rebased pursuant to a cost allocation study.

e) Please give an estimate on when YEC intends to submit its next general rates application and cost allocation study.

ANSWER:

(a) and **(b)**

Please see the preamble to this question which outlines how YEC will review its methodology to align its forecasts where reasonable and feasible with AEY's forecasts (particularly where such forecasts in an AEY compliance filing have been approved by the Board).

(c)

Wholesale forecast and actual information for 2016 to 2018 is provided in response to AEY-YEC-1-1. The additional information requested is out of scope for the current proceeding.

(d)

Rate Policy Directive 1995/90 does not prevent rate riders from being included into base rates. This occurred as part of the 2009 Phase II Rate Application.

OIC 2018-220 requires that the Board ensure that rate adjustments for all retail and industrial customers apply equally, when measured as percentages.

(e)

Yukon Energy is currently planning to file a 2019/20 General Rate Application. Yukon Energy has no plans to file a cost allocation study at this time.

TOPIC:

REFERENCE: YEC 2nd Compliance Filing – Page 2-3

QUOTE:

PREAMBLE:

"At paragraph 66, the Board noted its view that peak loads are likely to grow in coming years, and encouraged YEC to communicate closely with all parties (for example, customers, developers, mining operations) to forecast as accurately as possible to meet increased peak loads and new mining energy requirements. In response, Yukon Energy will continue to communicate with relevant stakeholders in order to ensure forecasts are as accurate as possible."

QUESTION:

a) Please explain how YEC will consult with residential customers regarding plans to address changes in peak loads.

ANSWER:

(a)

Yukon Energy will continue to communicate with relevant stakeholders in order to ensure forecasts are as accurate as possible. This includes communication with the AEY and major industrial customers regarding the load forecasts.

There are more than 16,500 residential customers in Yukon, most of whom are customers of AEY. Yukon Energy is not planning to consult with the individual residential customers to address peak loads. For its retail non-industrial customers, YEC routinely reaches out to community stakeholders (e.g. First Nations, Municipal reps, local YEC staff) to gauge growth expectations for the coming year.

TOPIC:

REFERENCE: YEC 2nd Compliance Filing – Page 2-5

QUOTE:

PREAMBLE:

"The Compliance Filing for the 2018 thermal generation forecast continues to use the 90:10 LNG: diesel fuel mix as assumed in the Application."

QUESTION:

a) Please provide details on the actual thermal generation mix for 2018.

b) Please provide an update to Table 2-3 (Actual Production Costs by Category) on page 2-8 of the Compliance Filing showing the actual breakdown of production costs for 2018.

ANSWER:

(a)

Please see response to AEY-YEC-1-4.

(b)

The requested information is outside the scope of the current proceeding. The Board provided its directions on revenue requirement and revenue issues for the 2017 and 2018 test years in Order 2018-10 and Order 2019-04 and Yukon Energy's 2nd Compliance Filing addresses these directions. The only remaining issues relate to the LWRF - and LWRF determinations do not affect revenue requirement or revenues.

TOPIC:

REFERENCE: YEC 2nd Compliance Filing – Page 2-8

QUOTE:

PREAMBLE:

"2017 actual transmission and distribution results are provided in the tables that follow, along with variance explanations. 2018 forecasts from the Application are also provided, with adjustment to Labour as required to reflect the updated capital-to-maintenance ratio."

QUESTION:

a) Please provide an update to Table 2-4 (Transmission Costs) and Table 2-5 (Distribution Costs) on page 2-9 of the Compliance Filing showing the actual breakdown of transmission and distribution costs for 2018.

ANSWER:

(a)

The requested information is outside the scope of the current proceeding. The Board provided its directions on revenue requirement and revenue issues for the 2017 and 2018 test years in Order 2018-10 and Order 2019-04 and Yukon Energy's 2nd Compliance Filing addresses these directions. The only remaining issues relate to the LWRF - and LWRF determinations do not affect revenue requirement or revenues.

TOPIC:

REFERENCE: YEC 2nd Compliance Filing – Page 2-10

QUOTE:

PREAMBLE:

"As directed, further line item detail for actual 2017 O&M costs is provided in the table that follows. The Compliance Filing assumes 2017 actual results. The 2017 variance for labour reflects the changes discussed above for Labour; the balance of other 2017 costs increased 5.4% over forecast, reflecting increased transportation and maintenance requirements net of lower than forecast SCADA communication requirements. The 2018 forecast retains the Application forecast (modified as discussed above for updated Labour capital-to-maintenance ratio)."

QUESTION:

a) Please provide an update to Table 2-8 (General O&M Costs by Category) on page 2-11 of the Compliance Filing showing the actual breakdown of O&M costs for 2018.

ANSWER:

(a)

The requested information is outside the scope of the current proceeding. The Board provided its directions on revenue requirement and revenue issues for the 2017 and 2018 test years in Order 2018-10 and Order 2019-04 and Yukon Energy's 2nd Compliance Filing addresses these directions. The only remaining issues relate to the LWRF - and LWRF determinations do not affect revenue requirement or revenues.

TOPIC:

REFERENCE: YEC 2nd Compliance Filing – Page 2-11

QUOTE:

PREAMBLE:

"As directed, further line item detail for actual 2017 Administration costs is provided in the table that follows. The Compliance Filing assumes 2017 actual results (modified as discussed above for Labour). The 2018 forecast retains the Application forecast (modified as discussed above for updated Labour capital-to-maintenance ratio)."

QUESTION:

a) Please provide an update to Table 2-9 (Administrative Costs by Category) on page 2-12 of the Compliance Filing showing the actual breakdown of administrative costs for 2018.

ANSWER:

(a)

The requested information is outside the scope of the current proceeding. The Board provided its directions on revenue requirement and revenue issues for the 2017 and 2018 test years in Order 2018-10 and Order 2019-04 and Yukon Energy's 2nd Compliance Filing addresses these directions. The only remaining issues relate to the LWRF - and LWRF determinations do not affect revenue requirement or revenues.

TOPIC:

REFERENCE: **YEC 2nd Compliance Filing – Capital and Deferred Projects – Page 2-22**

QUOTE:

PREAMBLE:

QUESTION:

a) Please confirm whether any costs associated with the recent abandonment of a proposed new 20 MW thermal power plant in Whitehorse are included in the costs being recovered in proposed 2017 and 2018 rates.

ANSWER:

(a)

As noted in the 1st Compliance Filing and the 2nd Compliance Filing, this project was forecast in the Application to remain in WIP during the test years. No costs are included in the test year revenue requirements.

Yukon Utilities Board
(YUB)

ISSUE/SUB-ISSUE: **Complexity**

REFERENCE: **Application, Appendix 2.1 — Page 2.1-1**

QUOTE: YEC quotes directions from Board Order 2018-10:

> The Board finds (paragraph 320) that the existing DCF is complex and that a simpler mechanism is needed for adjusting for variances between approved forecast hydro and thermal generation and actual (rather than modelled) hydro and thermal generation in a test year.

PREAMBLE:

QUESTION:

a) What options did YEC consider, other than the fixed change factor, to reduce the complexity of the Low Water Reserve Fund LWRF calculation? If other options were considered, why were those options not adopted for the LWRF calculations. If no other options were considered, please explain why.

ANSWER:

(a)

YEC understood that any option to simplify the LWRF still must meet the principles and specified objectives for the LWRF, whereby ratepayers bear the risk for any actual year-end thermal generation costs due to changes in water conditions from GRA forecasts and whereby the LWRF also smooths out water-related rate impacts over time.

For example, the Diesel Deferral Account (DDA) is a simplified approach rejected by the Board on the grounds that it did not meet LWRF objectives (see Appendix A to Board Order 2015-01, Section 2.3.1.4). The central challenge to this issue is the need to separate thermal generation into costs attributed to water-related risks, and those costs that relate to other risks that are properly attributed to the utility. The DDA approach was correctly rejected by the Board because it made no attempt to differentiate these risks and simply attributed all costs to rate payers.

YEC believes its DCF/LWRF approach as proposed in its June 2017 GRA Application meets this challenge and is consistent with approaches adopted in other hydro based jurisdictions. Further, while parties have made complaints regarding the complexity of this approach, during this extensive proceeding no one has offered any options that meet the desire for more simplicity while reasonably meeting the LWRF risk allocation objectives.

After review of the Board's direction in paragraph 320 of Board Order 2018-10, YEC identified the Fixed Change Factor as one possible simplification for consideration by the Board. YEC was not able to identify from the Board Order or submissions of parties, or from YEC's independent review, any other options in this regard that would meet the principles and objectives for the LWRF. The prior LWRF and subsequent DCF evolved in Yukon to reflect Yukon hydro grid conditions in a manner consistent (as required by OIC 1995-90, section 3) with principles established in Canada for utilities.

YEC proposed the Fixed Change Factor for consideration prior to Board Order 2019-04 which directed that LWRF determinations now be restricted to the GRA forecast load (see April 9, 2019 responses to YUB-YEC-1-20 and YUB-YEC-1-21). This direction might be seen as a simplification, by removing the LWRF requirement to address water-related thermal generation cost impacts as regards load changes from GRA forecast. However, as indicated in YEC's second compliance filing in September 2019, this new requirement adds new complexities to LWRF determinations which YEC has attempted to address. YEC also has concerns as to this new requirement's consistency with LWRF principles and objectives as addressed in paragraphs 321 and 322 of Appendix A to Board Order 2018-10 and in YEC's response to IRs related to the February 2019 compliance filing (see April 9, 2019 responses to YUB-YEC-1-14, YUB-YEC-1-17 and YUB-YEC-1-20, which also reference prior IR responses as relevant).

Board Order 2019-04 states (at page 11 of Appendix A) that "it was YEC's submission that the utility bore the risks with costs associated with incremental load". On this specific matter, YEC's responses and submissions have consistently affirmed that cost impacts due to water and wind availability and fuel price risk are borne by ratepayers – and that this principle applies to <u>actual</u> loads supplied by the utility, i.e., costs due load change from GRA forecast that are to be allocated to the utility are based on GRA fuel prices and GRA hydro water conditions (e.g., LTA hydro generation for 2018).[1]

[1] See for example YUB-YEC-2-1, (g and h), which states: "Based on normal regulatory principles, none of the risks related to water variance are borne by the utility."

ISSUE/SUBISSUE: **Thermal fuel ratio**

REFERENCE: **Application, Appendix 2.1 — Page 2.1-2, response, point 5**

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%.

QUESTION:

a) Please explain and illustrate the impact if YEC is not restricted to a thermal ratio of 90% LNG and 10% diesel.

b) Why is it necessary that the thermal ratio be fixed?

ANSWER:

(a)

For GRA purposes, an assumption must be made with respect to the thermal ratio. The YUB has approved a term sheet which determines the long term average thermal generation that is put into revenue requirement but there must by a fuel price assumption to convert KWh to dollars. YEC's approved GRA forecast for 2018 assumes a thermal generation ratio of 90% LNG and 10% diesel for the forecast LTA thermal generation fuel costs approved to set rates. Based on the GRA forecast fuel prices ($0.2633/kWh for diesel and $0.14668/kWh for LNG), the GRA average cost for forecast thermal generation is $0.1583/kWh.

YEC's final year end thermal generation fuel costs for 2018, after all LWRF transfers, will increase to the extent that the final thermal ratio (after LWRF transfers) is not restricted to the GRA ratio and instead reflects to any degree the actual thermal fuel ratio for 2018 of

approximately 82% LNG and 18% diesel,[1] e.g., the final average cost for thermal generation at the actual thermal ratio (82% LNG, 18% diesel) is $0.1677/kWh, or about 6% higher than the assumed GRA cost per kWh. Any final thermal ratio with diesel greater than 10% will result in a final average thermal generation cost higher than the assumed GRA forecast at $0.1583/kWh.

Under YEC's proposed LWRF approach in the Application the final year end thermal ratio was not necessarily fixed. YEC proposed that LWRF transfers enable the final year end thermal ratio to move as close as possible to 90% LNG when the actual generation share for diesel exceeds 10%; YEC's final year end LNG share after all LWRF transfers under this approach cannot exceed 90%, i.e., YEC's final average thermal generation costs at year end cannot end up being less than the $0.1583/kWh amount per the GRA forecast. (See April 9, 2019 response to YUB-YEC-1-12 (a) and (b) for review of prior responses on this matter.)

(b)

YEC's proposed LWRF approach to address fuel mix simply enables YEC's final year end thermal generation average cost per kWh to reflect as closely as possible the approved GRA thermal generation average cost per kWh.

As noted in more detail in YEC's April 9, 2019 response to YUB-YEC-1-18 (a) and (b), it is unclear what other options might be proposed for the LWRF approach to deal with the thermal ratio. YEC's operating philosophy with respect to thermal generation is to maximize LNG production in order to minimize costs and GHG emissions; the extent to which this is not feasible in practice is beyond YEC's control. One LWRF option to using the GRA ratio is to use the actual ratio for the year - however, the actual thermal ratio does not necessarily bear any relevance to the LTA fuel expense that YEC financial results are based on, and YEC also has no real ability to control the actual thermal ratio.

The October 8, 2019 Technical Session (see YEC Presentation – Background Notes, Part 6 at pages 20-22) reviewed LWRF thermal ratio issues and options for a range of scenarios with and without Board Order 2019-04 - including options that no longer require (as per the above quote for this IR) that LWRF transfers constrain the LNG share to not

[1] See October 8, 2019 Technical Session, YEC Presentation – Background Notes, table at page 22 (L7b3 for Actual). This reflects fuel mix net of capital, RFID and maintenance. AEY-YEC-1-1 shows a 2018 fuel mix of 81% LNG and 19% diesel that includes maintenance and capital.

exceed 100% of the transfer.[2] (See April 9, 2019 response to YUB-YEC-1-12 and YUB-YEC-1-3 for review of GRA proceeding evidence on this matter).

In conclusion, LWRF rules regarding the thermal ratio can be simplified to ensure that the thermal ratio for final YEC costs after all LWRF transfers is the same as approved for the GRA thermal generation cost forecast. This approach would ensure that YEC's final average thermal cost per kWh each year will equal the last approved GRA average thermal cost per kWh – and utilize the LWRF deferral account to accommodate actual cost variances from this GRA forecast that are beyond YEC's control.

[2] This constraint is not needed given that actual accounting for LWRF transfers addresses only net dollar amounts without recording any specific LNG or diesel generation amounts (see response to YUB-YEC-1-15). Retention of this constraint creates situations when diesel share of final YEC thermal costs will exceed 10%.

ISSUE/SUB-ISSUE: Simplified LWRF method

REFERENCE: Application, Appendix 2.1 — Page 2.1-3

QUOTE: The above changes in the amended LWRF were provided in the first Compliance Filing to simplify, as directed, the method used to determine the variance in hydro generation due to water availability.

QUESTION:

a) Please explain how each of the five points in the response on page 2.1-2 simplify the process for determining the LWRF.

ANSWER:

(a)

The five points in the response on page 2.1-2, as stated, simply summarized elements of the earlier GRA Application Term Sheet that were being retained. None of these elements were stated to be new items to simplify the process for determining the LWRF.

As previously stated, the only new measure proposed in the February Compliance Filing to simplify the LWRF in response to Board Order 2018-10 was adoption of the Fixed Change Factor (see April 9, 2019 response to YUB-YEC-1-13 and YUB-YEC-1-20). See response to prior IRs related to the September Compliance Filing (YUB-YEC-1-1 and YUB-YEC-1-2).

ISSUE/SUB-ISSUE: **Actual load versus forecast load**

REFERENCE: **Application, Appendix 2.1 — Page 2.1-3**

QUOTE: …In order to address this onus, the LWRF first determines (as provided for in the first Compliance Filing) the overall thermal generation cost change due to water condition changes for the actual load; the second step then assigns a portion of this thermal generation cost change to the forecast load for assignment to the LWRF as directed by the Board.

QUESTION:

a) Why does YEC's proposed LWRF calculation include water condition changes for actual load? Could a two-step process be used for load, (1) up to the forecast level, and then (2) applying a set of assumptions for load above forecast?

b) In order to determine the forecast thermal generation at the forecast level of load can the YECSIM model actual hydro conditions for actual load up to the forecast level of load?

c) For a test period in which a load forecast has been determined, at the start of that test year would YEC expect the forecast load to equal its forecast?

d) Regarding the response to part (c) above, in order to meet changing hydro conditions, at what point in a test year does YEC, through its operations, change its hydro generation from that reflected in the forecast for that test year? Please explain.

e) Regarding the response to part (c) above, in order to meet changing load conditions, at what point in a test year does YEC, through its operations, change its hydro generation from that reflected in the forecast for that test year? Please explain.

ANSWER:

(a) and **(b)**

Board Order 2019-04 requires YEC to estimate (after the end of the year) what the "actual" thermal generation with water availability impacts would have been at the forecast (rather than the actual) level of load.

Board Order 2019-04 recognized, in YEC's April 9, 2019 response to YUB-YEC-1-14(b), that YEC stated "…absent new model analysis, there is no basis to estimate what the actual thermal generation would have been with only the forecast load." In short, some form of new model analysis is required to comply with the Board's direction.

In its April 9, 2019 response to YUB-YEC-1-20, YEC set out the approach that was adopted in this regard for the September 2019 Compliance Filing. This approach retains established and tested methods (with the proposed Fixed Change Factor simplification) to assess water related changes for the actual load, and uses the results to provide a simple assessment to estimate actual thermal generation at the forecast load. The approach was reviewed in more detail in the October 8, 2019 Technical Session (see YEC Presentation – Background Notes, Parts 1 to 5). The methodology applies the ratio of actual thermal to modelled thermal at actual loads to forecast (approved) thermal to inflate/discount the forecast thermal for the water availability impact; see below for detailed description of this approach.

In summary, the proposed LWRF calculation includes water condition changes for actual load in order to assess, using established and tested methods, the extent that actual water conditions resulted in actual thermal generation varying from the LTA water conditions assumed for the approved GRA thermal generation forecast. This is the first step in a two step process to assess actual thermal generation at the forecast load – it provides the percentage for actual thermal generation relative to LTA thermal generation. The second step then applies this percentage to the LTA thermal generation at the forecast load to estimate actual thermal generation at that forecast load.

The question in effect asks whether YEC could instead re-run the YECSIM model after each year end, assuming forecast load and actual water conditions, in order to estimate actual thermal generation for the forecast load. This is not achievable with the current model as described below.

The YECSIM model used for the 2017-18 GRA is designed, tested and used to determine LTA hydro and thermal generation for a specified load based on simulation of weekly grid system operation (assuming current hydro generation capabilities and licences) over 35 years of historical water records. It has not been used, and is not designed to be used, to assess retroactively what actual hydro and thermal generation would have been under various possible loads for specific conditions that actually occur in any one year (let alone to determine retroactively the estimated actual thermal generation in such a year for a forecast load that did not in fact occur).

In theory, YEC might be able to redevelop the YECSIM as suggested to model, after a year has ended, what the actual thermal generation is expected to have been at the forecast load and the actual water conditions. This would require re-run of the model when the LWRF year end is being determined, i.e., unlike the proposed approach (or the approach used for past DCF/ LWRF determinations) it would not be practical to obtain Board approval in advance of a simple method that avoids any need to re-run YECSIM. The requirements for carrying out this approach, and the issues that may arise in assessing its implementation, have not been assessed. YECSIM redevelopment for this very different use could be complex, if practically feasible, with a need for each new LWRF annual year-end assessment of inflows available for outflows for the specified actual year. The increased reliance on modelling will also add to regulatory review complexity and, based on past experience, the resulting increased regulatory costs cannot be estimated at this time.

See also response to YUB-YEC-1-5 as regards YECSIM model.

(c), (d) and **(e)**

YEC is unclear as to what is being asked in question (c). Forecasts are subject to change continuously, particularly for load which can be affected by numerous factors (e.g. customer counts, weather, water supply, economic activity, etc.)

The LWRF for 2018 must address the LTA hydro and thermal generation forecast approved for GRA purposes. YEC's operation "short-term" hydro and thermal generation forecast for 2018 were not used for the GRA forecast, and therefore have no bearing on LWRF determinations for 2018. Therefore how and when YEC updates operational short-term forecasts has no bearing on LWRF determinations for 2018.

In the event that short-term forecasts were reconsidered in future GRAs, additional information is provided below on YEC's internal short-term forecasts for ongoing operations.

A test year forecast is often (but not always) developed prior to the start of the test year. As events unfold after the forecast is made, YEC will adjust its internal short-term forecasts accordingly in response to new information, i.e., there is no reason to assume that YEC will not change its internal forecast prior to the start of the test year.

Moreover, short-term operation forecast estimates will continue to change as required throughout a test year, i.e., there is no set dates/ times within the year for making such changes, beyond normal spring hydro updates based on winter snow load information. Hydro generation forecasts in particular are changed when needed during the year in response to new water supply information as well as new load information. Experience in the early 1990s highlighted a case where water supply was suddenly greatly enhanced by above normal rainfall at Aishihik Lake in late summer. Experience in 2019 has highlighted changes throughout the summer in expected water conditions at both Aishihik Lake (more than was expected pre-summer) and Mayo Lake (lower than expected pre-summer).

Such operational forecast changes at any time during a test year, however, typically have no bearing on what forecast will in fact be approved by the Board in a GRA for that test year, and certainly do not affect LTA forecasts used for GRA and LWRF determinations.

The 2018 GRA approved load forecast is a simple example in this regard. Evidence provided during the GRA proceeding indicated updated information with regard to this load forecast, including the updated expectation that it would materially exceed the initial GRA forecast of approximately 420 GWh. The final GRA approved forecast nevertheless, in accordance with past GRA practice, did not materially change the 2018 load forecast (beyond reflecting the fact that Minto's load was expected to decline somewhat). And short term hydro and thermal generation forecasts for test years were reviewed and not adopted for 2017-18 test year GRA purposes.

In contrast, the Board approved actual load results for the 2017 GRA test year, reflecting the extent that the proceeding had been extended well beyond that test year.

ISSUE/SUB-ISSUE: LWRF modelling

REFERENCE: Application, Appendix 2.1 — Page 2.1-4

QUOTE: Absent model analysis to assess actual thermal generation relative to actual firm load (and to determine how actual thermal generation compares with LTA thermal generation as determined for the GRA approved forecast), there is no basis to use the above information to do what the Board directs, i.e. to determine what actual thermal generation would have been with actual water conditions and only the forecast load.

QUESTION:

a) Within the existing YECSIM model, could model analysis be used to assess actual thermal generation relative to actual firm load? If it can, what is the expected cost of the analysis?

ANSWER:

(a)

The question in effect asks whether YEC could re-run the YECSIM model after each year end, assuming forecast load and actual water conditions, in order to estimate actual thermal generation for the forecast load.

The YECSIM model used for the 2017-18 GRA is designed, tested and used to determine LTA hydro and thermal generation for a specified load based on simulation of weekly grid system operation (assuming current hydro generation capabilities and licences) over 35 years of historical water records. It has not been used, and is not designed to be used, to assess retroactively what actual hydro and thermal generation would have been under various possible loads for specific conditions that actually occur in any one year (let alone to determine retroactively the estimated actual thermal generation in such a year for a forecast load that did not in fact occur).

If YEC was so ordered, this would effectively require the development of an additional model which would presumably be subject to separate review and verification by the

Board. In theory, YEC might be able to redevelop the YECSIM as suggested to model, after a year has ended, what the actual thermal generation is expected to have been at the forecast load and the actual water conditions. This would require re-run of the model when the LWRF year end is being determined, i.e., unlike the proposed approach (or the approach used for past DCF/ LWRF determinations) it would not be practical to obtain Board approval in advance of a simple method that avoids any need to re-run YECSIM. The requirements for carrying out this approach, and the issues that may arise in assessing its implementation, have not been assessed. YECSIM redevelopment for this very different use could be complex, if practically feasible, with a need for each new LWRF annual year-end assessment of inflows available for outflows for the specified actual year. The increased reliance on modelling will also add to regulatory review complexity and, based on past experience, the resulting increased regulatory costs cannot be estimated at this time.

Please see response to YUB-YEC-1-4 (a) and (b) for review of the proposed approach as compared to the above approach requiring re-run of YECSIM. YEC adopted the proposed approach to avoid new model analysis and to utilize established and tested methods that the Board and intervenors have reviewed in detail in the current GRA proceeding as well as in prior GRA proceedings.

ISSUE/SUB-ISSUE: Estimated actual diesel generation

REFERENCE: Application, Appendix 2.1 — Page 2.1-5

QUOTE: …Board Order 2019-04 requires that the LWRF be determined based on estimated actual thermal generation for the forecast load; to comply with this direction, the percent of actual diesel at the estimated actual thermal generation for the forecast load is assumed to be the same as the actual diesel generation percentage of actual year-end YEC firm generation (see Attachment 2.1-1 and Tables 2.1-2 and 2.1-3 for examples).

QUESTION:

a) Please explain how the accounting works in the LWRF if the actual diesel generation percentage is different from the forecast.

ANSWER:

(a)

Please see response to YUB-YEC-1-15 (a).

ISSUE/SUB-ISSUE: LWRF Term Sheet – Fixed change factor

REFERENCE: Application, Attachment 2.1-1, pages 2.1-1 to 2.1-2

QUOTE: 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 change in YIS firm load (actual minus approved GRA forecast). 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. (Footnote removed)

QUESTION:

a) Please discuss the impact to YEC and customers if the above quoted paragraph is removed from the term sheet.

ANSWER:

(a)

The above quoted paragraph from the LWRF term sheet establishes use of the Fixed Change Factor to determine LTA generation at the actual load. Removal of this paragraph without a replacement would render the LWRF inoperable, i.e., it is assumed necessary to specify LTA generation at the actual load in order to proceed with year-end LWRF determinations regardless of Board Order 2019-04 requirements (see response to YUB-YEC-1-4).

As per Appendix 3.4 of the GRA Application, it is assumed that the replacement would re-establish determination of the expected YEC thermal generation at the actual load based on LTA water-based YEC hydro generation that is forecast using a formulaic relationship to load in each year (including non-test years) as per a Term Sheet Table (for 2018 GRA this would be Table 2.4-1 from the February Compliance Filing - see copy of table in October 8, 2019 Technical Session, YEC Presentation – Background Notes, Part 4),

including provision for the Board to review and approve table update when required in future to address the same material changes as referenced in the above quoted paragraph.

Removal of the Fixed Change Factor and resumed use of a Term Sheet Table would increase the LTA thermal generation estimate used at the actual 2018 generation load, from 28.464 GWh in the Compliance Filing to 31.295 GWh (see calculations explained at October 8, 2019 Technical Session, YEC Presentation – Background Notes, Part 4, pages 9 and 10). A higher LTA thermal generation at actual load for 2018 would reduce the LWRF payment to YEC related to water conditions being less than LTA. Under YEC proposed approach to implement Board Order 2019-04 directions, estimated actual thermal generation at forecast load would be reduced by 1.89 GWh (from 20.92 GWh in the second compliance filing to 19.03 GWh), thereby reducing the gap between actual and LTA generation for this load by this same amount. Under LWRF implementation prior to Board Order 2019-04 directions, the gap between actual and LTA generation at the actual load would be reduced by 2.831 GWh.

Overall, the Fixed Change Factor simplification compared to the earlier LWRF/DCF Term Sheet Table approach leads to variances that benefit YEC versus customers for any plus or minus variance in actual load from forecast load. This is shown in the figure at page 10 of the October 8, 2019 Technical Session, YEC Presentation – Background Notes. See also April 9, 2019 response to YUB-YEC-1-15 (pages 2 and 3) which highlighted variance in results related to adoption of the Fixed Change Factor and how this variance increases as load change from GRA forecast increases.

ISSUE/SUB-ISSUE: LWRF Term Sheet — LWRF Thermal Savings (Costs)

REFERENCE: 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 (when setting LWRF based on actual load) 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, with adjustments to comply with Board Order 2019-04. (Footnotes removed)

QUESTION:

a) Please discuss the impact on YEC and customers if the above quoted paragraph is removed from the term sheet.

ANSWER:

(a)

The above quoted paragraph from the LWRF term sheet establishes rules for addressing fuel mix to determine LTA thermal generation transfer costs. Removal of this paragraph without a replacement would render the LWRF inoperable, i.e., it is necessary to specify fuel mix in order to translate energy impacts (kWh) to dollars that adjust YEC fuel cost and LWRF account balances.

See the response to YUB-YEC-1-2 (current IRs) for a review of the following related to fuel mix and LWRF requirements and options:

- Basic requirements and options relating to LWRF fuel mix rules;

- Reference to an outstanding need to edit the above quoted paragraph to implement changes otherwise noted to be required to implement Board Order 2019-04 directions; and

- Review of related examples and information from the October 8, 2019 Technical Session, YEC Presentation – Background Notes, Part 6 that address the following:

    - LWRF with Board Order 2019-04 directions context with modified fuel mix rules whereby the diesel share of the actual load is assumed also to apply for forecast load actual diesel (subject to LNG share never being more than 90%); in addition, the refined fuel mix determinations in the October 8, 2019 Technical Session materials no longer required that LWRF transfers constrain the LNG share to not exceed 100% of the transfer, i.e., the refined rules focused on the final fuel mix that results at year end for YEC after all LWRF transfers.

    - LWRF prior to Board Order 2019-04 directions with modified fuel mix rules, i.e., when actual thermal generation exceeds LTA (i.e., lower water conditions than LTA) LTA generation fuel mix in the Technical Session materials assumed diesel at the share applicable to actual generation (to address situations where actual diesel cannot be assumed to be required for the LTA thermal generation). In all other situations, the LTA generation fuel mix continued to assume actual diesel with LNG not to exceed 90%. The response to YUB-YEC-1-2 also assessed the impact of simply assuming that the LWRF fuel mix rules would set the expected LTA thermal fuel mix at 90% LNG and 10% diesel without regard to actual diesel thermal generation, and remove any constraint that LNG transfers not exceed 100% in cases where actual diesel thermal generation exceeds 10%.

Overall, fuel mix rule options in the LWRF can have a direct impact on YEC final thermal costs (i.e., after all LWRF transfers) for a completed fiscal year. The stated objective is to end up with YEC actual fuel mix costs unchanged from the GRA forecast (based on 90% LNG and 10% diesel, using GRA forecast fuel prices).

- YEC is not able to secure costs below the GRA fuel mix cost - however, under some fuel mix options YEC can end up bearing costs greater than the GRA fuel mix cost (i.e., when diesel share of final thermal generation costs exceeds 10%).

Customers have no immediate rate impact cost from LWRF fuel mix options – however, fuel mix options that increase YEC fuel mix costs above GRA forecasts also in effect change the cost of LWRF transfers (i.e., YEC payments to LWRF increase under high water conditions, and LWRF refunds to YEC decrease under low water conditions) and the result improves the net balance in the LWRF (which in turn benefits customers in the long term).

Under the above proposed rules with Board Order 2019-04 directions, the October 8, 2019 Technical Session information indicated that final YEC thermal generation fuel costs (i.e., after all LWRF transfers) under each scenario example considered would match the 90% LNG and 10% diesel fuel mix assumed for the GRA forecast – however, reinstitution of the constraint that LNG transfers not exceed 100% would increase YEC final year end fuel mix costs per kWh in most cases examined.

The response to YUB-YEC-1-3 indicated, under proposed rules assuming LWRF based on actual load, YEC final year end costs per kWh higher than the GRA fuel mix for most of the scenario examples considered; however, these YEC final year end costs would equal the GRA fuel mix costs if the fuel mix rules are simplified to set the expected LTA thermal fuel mix at 90% LNG and 10% diesel without regard to actual diesel thermal generation, and without any constraint that LNG transfers not exceed 100% in cases where actual diesel thermal generation exceeds 10%.

In summary, the impact on YEC and customers will vary depending on the replacement fuel mix rules adopted. Simplified fuel mix rules are identified to ensure that final YEC fuel mix costs per kWh (i.e., after all LWRF transfers) equal GRA forecast fuel mix costs for LWRF options based on either forecast load or actual load.

ISSUE/SUB-ISSUE: LWRF Term Sheet — Diesel on the margin

REFERENCE: Application, Attachment 2.1-1, pages 2.1-2 to 2.1-3

QUOTE:

QUESTION:

a) Please discuss the impact on YEC and customers if the paragraph regarding "Diesel on the Margin" is removed from the term sheet?

ANSWER:

(a)

Removal of the quoted paragraph regarding "Diesel on the Margin" would have no impact on YEC or on customers. This paragraph was adopted during the period when the DCF was being re-activated after the Faro Mine closure – and its only purpose is to state the Board's determination that there is a reasonable expectation that under current conditions that diesel or "thermal" generation will form part of baseload generation thus making the question of diesel being either "on the margin" or "off the margin" moot.

ISSUE/SUB-ISSUE: LWRF Term Sheet — Quantum & Cap

REFERENCE: Application, Attachment 2.1-1, page 2.1-3

QUOTE:

QUESTION:

a) Should the cap be reconsidered when new major loads are coming onto the system? Please explain.

b) Should the cap be reconsidered when new major loads are leaving the system? Please explain.

c) Should the cap be reconsidered when new major production facilities are either being deployed on the system or being removed from the system? Please explain.

ANSWER:

(a) through **(c)**

Overall, the LWRF cap should be reconsidered when any of the changes noted in this question occur, subject to practical and reasonable limits on the timing and frequency of such reconsiderations and the impact on current rider charges or rebates for customers (e.g., reducing the cap can lead to rebate riders when the cap is positive, and the lower rider charges when the cap is negative – and it would not be desirable if such changes adversely impacted rate stability objectives for the LWRF).

In Section 1.4 of the Appendix 3.4 and Attachment 3.4.4 of the Application Yukon Energy provided assessment of the LWRF (old DCF) cap.

Yukon Energy specifically noted the following regarding the fund:

> "The DCF has been established to provide stability for rates, and to reflect the underlying long-term valuation of renewable hydro and wind resources (where economic feasibility typically is assessed based on long-term average energy

> supply). Rate stability is achieved, as noted above by the Board in Order 2015-01, by limiting the requirement for separate rider collections/refunds to ratepayers, and by enabling ratepayers (to the extent practical) to pay the same LTA cost during droughts as during floods."
>
> "To achieve its objectives, the DCF needs robust threshold limits, i.e., maximum and minimum levels allowed before funds are dispersed (for overages) or replenished (when fund falls below minimum)."

For example, assessment in Attachment 3.4.4 of the Application showed that at higher loads a higher cap of +/- $16 million (versus the current +/- $8 million cap) could reduce Rider E impact frequency and enable the fund to be more robust in dealing with severe drought (with reduced rate instability for ratepayers).

In the Application, page 3.4-11 YEC also noted that "there is no reasonable basis today to consider any lower cap than the +/-$8 million last approved by the Board." Therefore, the increase of the cap would be a reasonable approach with higher loads, but there is no reasonable basis at this time to reduce the cap if the load reduces.

The system changes such as addition or removal of significant renewable generation source added to the Yukon grid that replaces thermal generation or causes dramatic increase in thermal generation could also trigger the review of the LWRF cap. However, in the near-term Yukon Energy does not expect any such changes.

Please also see prior GRA proceeding responses to YUB-YEC-1-47, YUB-YEC-2-11 (c) and (d), AEY-YEC-1-3 (a) through (d), AEY-YEC-2-2.

ISSUE/SUB-ISSUE: LWRF Term Sheet — Quarterly and Annual Reporting

REFERENCE: Application, Attachment 2.1-1, page 2.1-3

QUOTE:

QUESTION:

a) Should the LWRF be adjusted on an annual basis or, alternatively, as part of the process for a GRA? Please explain.

b) Should the LWRF be reconciled on an annual basis or as part of the process for a GRA? Please explain.

ANSWER:

(a) and **(b)**

In cases such as the current 2018 year end determination, the process of finalizing the LWRF term sheet and GRA forecasts for 2017 and 2018 is overlapping with the process for the 2017-18 GRA – but in cases where a year ends without a concurrent GRA, the LWRF adjustments and/ or reconciliations should still be concluded rather than waiting for another GRA.

As reviewed in the October 8, 2019 Technical Session, YEC's Presentation – Background Notes at page 1, the LWRF implementation at fiscal year-end requires prior completion of a GRA process. Accordingly, LWRF determinations for GRA test years cannot be concluded until the GRA is concluded – and can be addressed therefore as part of the process for a GRA. After GRA test years have been addressed, the LWRF determinations should proceed on an annual basis until the next GRA test years occur.

In summary, the GRA process establishes the rules for transfers in and out of the LWRF. Once actual generation is known, YEC has all the information required to determine the adjustments required to properly record its annual fuel expense and close off its financial statements. The Board reviews and approves each LWRF Annual Report – at which time adjustments can be made to LWRF LTA-related assessments if so required in response to material changes in loads, generation capability or licences, or other factors.

ISSUE/SUB-ISSUE: YEC cost risks

REFERENCE: YEC Technical Session, Notes for Oct. 8, 2019 technical session final.doc, graphs pages 15 and 16 and table on page 19

QUOTE: The figure highlights the water related thermal generation of 37.09 GW.h related to load changes that YEC would be at risk as a cost. [page 16]

PREAMBLE:

Scenario 4 in the graphs and table, the drought scenario, uses an increase in load of 37.8 GW.h or a 9% increase in load over forecast and an increase in thermal generation of 89.64 GW.h or an increase of 548% in thermal generation over forecast.

QUESTION:

a) Please comment on the probability that YEC could incur a load forecasting error of 9% or greater during a test period.

b) Please comment on the probability that YEC could incur a thermal generation forecasting error of 548% or greater during a test period.

c) With respect to the response to part (b), would the use of a short-term forecast provide a more accurate accounting in a drought scenario? Please explain.

d) If the changes in the drought scenario were to occur outside of a test period, could YEC mitigate these risks by submitting an application to the Board for any necessary adjustments to the LWRF?

e) Regarding thermal cost risks due to incremental load, are these costs mitigated through increased revenues from existing rates? Please explain why or why not.

f) If YEC's revenue requirement, based on forecast levels, recovers its forecast costs over forecast volumes, then for the exception of variable costs such as

fuel, would incremental revenue above forecast load levels provide a greater net contribution to YEC earnings (assuming no incremental fixed costs)? Please explain.

ANSWER:

(a)

YEC has very little likelihood of incurring a load forecasting error of 9% or greater during a test period, i.e., in 2018 the actual load was 6.4% higher than the forecast approved by the Board.

Reducing the Scenario 4 load change to the actual 2018 load (i.e., the 6.4% higher than forecast load) would reduce the water change impact borne by YEC to 32.09 GWh (versus 37.09 GWh in the figure at page 16).

Looking beyond a test year, however, YEC could incur a load forecast increase of 9% or greater if a major new industrial load was connected, e.g., connection of the Victoria Gold load would result in an increase over the 420 GWh 2018 GRA forecast well in excess of this limit even if the Minto load had been disconnected.

(b), (c) and **(d)**

YEC's GRA forecasts thermal generation for 2018 are based on LTA hydro, not short term hydro forecasts, in accordance with Board Order 2018-10 directions. Therefore there is no basis to discuss a "forecast error" for thermal generation under this 2018 scenario.

In the LTA forecast context an actual increase of thermal generation to Scenario 4 levels of 106 GWh is within the limits of the 35 year water record YECSIM assessment for a grid load of only 420 GWh, i.e., a higher one-year drought impact maximum would occur at any higher load. Detailed YECSIM forecasts as provided in the Application for each of 35 water years as used to derive LTA thermal generation for three grid load forecasts (including the 420 GWh load forecast) are provided in the October 8, 2019 Technical Session, YEC Presentation – Background Notes, page 5.

Short term YEC internal operation forecasts (outside any GRA period) may reveal to YEC the risk of an extreme drought annual impact given evidence (see above) that the historic

extreme drought water year of 1989 occurred after 3 or 4 years of significant low water years. As noted at the October 8, 2019 Technical Session, YEC would therefore likely have ability to mitigate the extreme impacts shown in Scenario 4 by filing a new GRA with an adjusted load forecast such that YEC does not bear the identified risk, i.e., all reasonable water related risk for a drought [and potentially added risk] is assigned to ratepayers under Board Order 2019-04 so long as actual grid load is less than the last GRA forecast load (see summary conclusions at pages 17 and 18 of October 8, 2019 Technical Session, YEC Presentation - Background Notes).

Notwithstanding the above mitigation options for the extreme drought event, the 35 water year information referenced above includes an initial year drought impact for 420 GWh load requiring 50 GWh of thermal generation. Assuming an actual load as per 2018 results this drought event would result in a material water change impact borne by YEC of 9.16 GWh. YEC would obviously seek to mitigate this risk by filing a new GRA - but timing options in practice are far less reliable in this situation compared to the extreme drought event.

(e) and **(f)**

Increased revenues occur with added loads compared to GRA forecasts – however, it is not appropriate to consider such added revenues as “mitigating” for YEC bearing any added costs clearly due to water related risks, i.e., the basic principle is that ratepayers and not the utility bear all risks for added thermal generation costs due to adverse water condition changes. Further, the LWRF focus today is limited to thermal generation fuel cost impacts related to water changes from LTA – and fuel costs for all actual loads are assessed at forecast fuel prices, i.e., no added complexities are included to separate actual versus forecast fuel costs for actual versus forecast loads.

Under Board Order 2019-04, it is also relevant to note that YEC bears the risk of added water-related costs under Scenario 3 when actual load is less than forecast and water conditions are better than LTA average. In this scenario YEC obviously bears the added reality that actual sales revenues are less than GRA forecast, and no opportunity exists for YEC to mitigate adverse water related impacts.

TOPIC:

REFERENCE: **YEC Technical Session, Notes for Oct. 8, 2019 technical session final.doc, table on page 19**

QUOTE:

ISSUE/SUB-ISSUE: Residual impact of water change borne by YEC

PREAMBLE:

Line 12 of Table 2.1-1, scenario 4 shows an extra cost to YEC of $5.872 million.

QUESTION:

a) Please provide: (1) the offsetting revenue associated with the incremental load, stating all assumptions; and (2) the increased other variable costs associated with the increased load, stating all assumptions.

b) Given your response to part (a), show the net impact to YEC.

ANSWER:

(a) and **(b)**

As reviewed in response to YUB-YEC-1-12, Scenario 4 represents an extreme drought impact as well as a major new mine load plus added 2018 wholesale loads above GRA forecast. The extra water-change thermal cost borne by YEC shown of $5.872 million assumes thermal generation added of 37.09 GWh and final YEC year-end fuel mix at GRA average forecast cost.

YEC has no estimate of added revenues associated with the hypothetical added load of 35.80 GWh for that scenario because there is no basis for assuming which customer classes will generate the additional load. Based on 2018 actual results (see AEY-YEC-1-1) compared to GRA forecast, over half of the sales increase would be wholesales and most of the balance would be industrial sales. As demonstrated by ERA assessments in Appendix 2.2 of the February compliance filing, added sales are likely at this time to

provide more revenues than added costs for YEC so long as added thermal generation is assessed at LTA hydro (with added thermal at well under 100% of added generation with the Fixed Change Factor). However, a severe drought combined with material added load will likely result in all added load being supplied by thermal generation at a cost of at least 15.83 cents per kWh of generation (assuming 90% LNG and 10% diesel), or about 17.32 cents per KWh of added sales (assuming losses at 9.34% for 2018). In this situation added sales will not provide added revenues equal to the added thermal fuel generation costs. Added wholesales will likely yield added revenue of only about 11 cents per kWh of added generation[1] - and the impact on AEY of any ERA recoveries may flow through to ratepayers. Revenue for the bulk of the balance of added load relating to industrials will depend a great deal on load shape - however, total added revenues per kWh of added generation are not expected to approach the 17.32 cents of added thermal costs.

The utility would also bear increased cost of maintenance on thermal generation units from additional run time. For example, cost consumables like filters, oil changes, minor overhauls would be significantly higher due to higher run times. There is no reasonable basis for estimating these costs at this time as the actuals would be dependent on which specific units in the fleet were run and the associated run times. In accordance with current practice for non-test years, these costs would be absorbed by YEC.

As reviewed in YUB-YEC-1-12 (d and e), increased revenues occur with added loads compared to GRA forecasts – however, it is not appropriate to consider such added revenues as “mitigating” for YEC bearing any added costs clearly due to water related risks, i.e., the basic principle is that ratepayers and not the utility bear all risks for added thermal generation costs due to adverse water condition changes. Further, the LWRF focus today is limited to thermal generation fuel cost impacts related to water changes from LTA – and fuel costs for all actual loads are assessed at forecast fuel prices, i.e., no added complexities are included to separate actual versus forecast fuel costs for actual versus forecast loads, notwithstanding that actual fuel costs for a 90% LNG and 10% diesel fuel mix are currently higher than the GRA forecast.

[1] See Table 3 of Appendix 2.2 of February compliance filings (shows added revenues at 10.9 cents per kWh of wholesales).

ISSUE/SUB-ISSUE: **Fuel Mix**

REFERENCE: **YEC Technical Session, Notes for Oct. 8-19 technical session final.doc, page 20**

QUOTE: In addition to LWRF overall thermal generation assigned to the LWRF at the end of 2018, it is also necessary to address actual diesel/LNG fuel mix relative to the GRA forecast assumption of 90/10 diesel/LNG fuel mix. Fuel mix assessments affect the final costs for thermal generation transfers in or out of the LWRF.

QUESTION:

a) Must the LWRF contributions to/payments from be set according to forecast fuel mix? Please explain, also providing any other options considered by YEC.

b) What is the effect of using actual fuel mix in calculating contributions to/payments from the LWRF? Please explain.

ANSWER:

(a) and **(b)**

Please see response to YUB-YEC-1-2 and YUB-YEC-1-8 for detailed review of fuel mix issues and options, including references to April 9, 2019 IR responses related to the same matters. The responses address effects of adopting fuel mix costs that are higher than the GRA forecasts – in practice, the impact will increase YEC's final year end thermal generation fuel costs (after all transfers) and increase LWRF balances.

It is important to remember that forecast fuel mix for GRA forecasts assumes LTA thermal generation (and not any forecast of actual thermal generation at the forecast load). There is therefore no reasonable basis for assuming that LWRF transfer costs should be tied to actual fuel mix – and use of the GRA forecast fuel mix results in GRA average fuel costs being retained for YEC final actual (i.e., after LWRF transfers) thermal generation subject to LWRF transfers.

ISSUE/SUB-ISSUE: **Fuel Mix**

REFERENCE: **YEC Technical Session, Notes for Oct. 8-19 technical session final.doc, page 21**

QUOTE: In summary, the detailed fuel mix assessment for 2018 increases the dollar value of the year-end 2018 actual example for the LWRF transfer from $0.722 million in Table 2.1-1 (which assumed the average fuel price of $0.1583/kWh) to $0.922 million (average cost of $0.2022 per kWh). The increase in average cost reflects the high proportion of diesel in the LWRF transfer required to yield a year-end 90/10 LNG/diesel mix for the forecast load thermal generation cost.

QUESTION:

a) If the actual fuel mix costs are greater than forecast, how and where is this difference accounted for? Please explain using an illustrative example.

b) If, in response to part (a), the difference is adjusted through the provision to the LWRF, does this mute or amplify any impacts due to low-water (or high-water) events? Please explain.

ANSWER:

(a)

Table 1 below provides the example information used to respond to this question, based on the 2018 GRA and 2018 actual example in the October 8, 2019 Technical Session, YEC Presentation – Background Notes, pages 21 and 22. The example shows:

i. The 2018 GRA forecast as approved for load, thermal generation fuel mix, and LNG and diesel fuel prices.
    - The GRA forecast assumed 90% LNG and 10% diesel fuel mix, and a resulting cost of $2.590 million.

ii. YEC actual thermal generation (as relevant for LWRF), with the actual fuel mix and YEC costs as booked at GRA forecast fuel prices.
   - Actual thermal generation in the example show 82% LNG and 18% diesel fuel mix, and a resulting cost of $6.112 million.

iii. Assumed LWRF deferral account adjustments for water change impacts to forecast load as per Board Order 2019-04, with the assumed fuel mix and cost transfers to YEC.
   - The assumed transfer of $0.922 million assumes a fuel mix of approximately 52% LNG and 48% diesel which results in YEC's final costs after this transfer for the forecast load having a fuel mix as per GRA forecast (90% LNG and 10% diesel) and a resulting cost of $5.190 million.

iv. Resulting YEC final booked costs of $5.190 million reflects the combined impact of the LWRF adjustments for the forecast load and YEC actual thermal generation costs for the balance of the actual load. The resulting overall fuel mix in the example that would be reflected on YEC's accounts is approximately 86% LNG and 14% diesel.

Table 1: 2018 Illustrative Example

		2018 GRA	Assumed 2018 Actual	
		A	B	
	Total Thermal			
1	*YEC Net Diesel/LNG*	16,355	36,400	MW.h
2	*Diesel*	*1,636*	6,628	MW.h
3	*LNG*	*14,720*	29,772	MW.h
4	Diesel Fuel Cost per kW.h	26.333	26.333	cents/kW.h
5	LNG Fuel Cost per kW.h	14.668	14.668	cents/kW.h
6=2*4/100+3*5/100	**Total YEC Thermal Cost before LWRF**	**$2,590**	**$6,112**	**$000**
7	Transfers to/(from) LWRF		($922)	$000
8	*Diesel transfer (volume)*		(2,173)	MW.h
9	*LNG transfer (volume)*		(2,386)	MW.h
10=8*4/100	*Diesel transfer ($)*	*$0*	*($572)*	$000
11=9*5/100	*LNG transfer ($)*	*$0*	*($350)*	$000
12=6+7	**Total YEC Thermal Cost after LWRF**	**$2,590**	**$5,190**	**$000**

Notes:
1. GRA column reflects 2018 forecast in the 2017/18 GRA.
2. Assumed actual reflects Actual 2018 example provided in October 8, 2019 Technical Session, page 22.
3. The load for assumed actual is YEC Grid load net of expected Fish Lake and Wind.
4. Diesel and LNG fuel prices are based on 2017/18 GRA approved prices. Variations form these fuel prices variations are included in DFPVA.

None of the GRA forecast information [bullet (i)] is entered through accounting into YEC's financial records. The accounting record occurs 1) after actual thermal costs are incurred

[bullet (ii)], and then again 2) after year-end when the LWRF transfers occur to adjust YEC's actual year end thermal fuel generation costs [bullet (iii)].

The accounting entries are as follows [based on illustrative example in Table 1; $ amounts only]:

1) After actual thermal costs are incurred[1]

<Debit> Fuel Expense (Income Statement)	$6.112M
<Credit> Cash (Balance Sheet)	$6.112M

2) After year-end when the LWRF transfers occur[2]

<Debit> Low Water Reserve Fund (Deferral Account)	$0.922M
<Credit> LWRF Transfer (Income Statement)	$0.922M

Therefore, net fuel expense to YEC is $5.190 M ($6.112M less $0.922M).

(b)

The above illustrative example shows a year with lower than LTA water and a load that was well above GRA forecast. The LWRF in this example mutes the impact of the low water, but only for the forecast load (per Order 2019-04) – and the LWRF mechanism to adjust the fuel mix from actual reduces final YEC costs for the forecast load to conform with the GRA fuel mix (which results in YEC's actual costs for the forecast load being equal to the GRA forecast cost).

The October 9, 2019 Technical Session, YEC Presentation – Background Notes, Part 4 reviews impacts on YEC costs of the LWRF under varying load and water condition scenarios.

[1] The final amounts shown are costs for fuel from inventory, and after DFPVA adjustments. Actual fuel cost recording tracks LNG and diesel costs separately.

[2] LWRF recording track the final LWRF dollar amount transfer to or from YEC; details on fuel mix assumed for these transfers is not tracked for accounting records.