Yukon Energy Corporation
Energy Project Certificate and Energy Operation Certificate Application for the Proposed Whitehorse Diesel to Natural Gas Conversion Project

Yukon Utilities Board (YUB) Information Request Round 1 to Yukon Electrical Company Limited (YECL)

YUB-YEC-1

Reference: YEC LNG Project Application (Application), page 12

Issue/sub-issue: YESAB screening

Quote: The schedule anticipates completion of the YESAB review, Part 3 YUB review, and Decision Body Approvals, and securing all needed permits and approvals required to commence construction of the Project by May 1, 2014.

o The YESAB Executive Committee assessment process includes, at a minimum, the following major steps:

- A pre-screening adequacy review …
- Screening with Public Comment …
- Release of draft screening report – February 1, 2014 is targeted for issuance of the draft screening report …
- Public comment on the Draft Screening Report and release of the final report recommendations… YEC's schedule assumes review and comment on the YESAB Draft Screening Report will be complete within 30 days of its release, with Final YESAB Recommendations provided within 60 days of the YESAB's release of its Draft Screening Report, i.e., by April 1, 2014.
- YEC's schedule assumes approval of the YESAB Recommendations by all Decision Bodies (i.e., the Yukon Government) within 15-20 days following release of YESAB's Recommendations.

Preamble: The Board requires further information.

Request:

(a) Given the relatively short construction season in Yukon and the regulatory processes that are necessary in order that YEC obtain the required permits and approvals for the project to proceed, does YEC have contingency plans in place in case the necessary approvals are not issued by May 1, 2014 and it is unable to commence construction on this date? Please explain what these plans are.

(b) Please provide an update with regard to the expected release date of YESAB's draft screening report.

(c) Please provide updated release dates of (i) the YESAB Final Recommendations report, and (ii) expected "approval of the YESAB recommendations by all Decision Bodies (i.e. the Yukon Government.)"

(d) Considering that the LNG project costs "…are preliminary estimates developed in mid-2013 based on preliminary quotes and engineering,"[1] can YEC provide any updates to its project costs and is YEC anticipating any additional costs for mitigation measures that may result from the YESAB review that is currently underway? If no updates to the project costs are available, can YEC provide what order of magnitude of additional costs may result from further engineering or the YEASAB review?

1. Application, page 8.

YUB-YEC-2

Reference: Application, page 39
Issue/sub-issue: Regulatory and schedule risks
Quote: Regulatory/Schedule risks — Exist to the extent that permits and approvals are not available, or weather conditions are not favourable, to allow construction activities to commence as planned starting May 1, 2014. Delay of Project construction beyond May 1, 2014 threatens the ability to complete Project construction in the 2014 summer construction season and the ability to have the Project in service before the end of Q4 2014 in order to be available to displace diesel requirements in the winter of 2014/2015. Delay of Project in service also increases the risk of YEC incurring added capital costs. Not having the Project in service by the end of 2014 means that the Project will not be in place to reduce ratepayer fuel costs in the first half of 2015 by approximately $2.1 million and that new thermal generation capacity for reliable service will also not be available as required during that winter.
Preamble: The Board needs further information.

Request:

(a) What, if any, are the financial impacts to YEC or its customers beyond the lost $2.1 million ratepayer savings, if there are delays of six months or one year with respect to having the LNG project in service prior to the end of Q4 2014?

(b) Please provide detailed cost/benefit analyses assuming (i) a six-month delay and (ii) a one-year delay with respect to the estimated end of Q4 2014 project start-up date. Please provide explanations related to additional maintenance costs that may arise. Please provide calculations in an Excel spreadsheet with all formula intact. Please include additional maintenance costs (beyond normal O&M costs) to allow the existing diesel generators to operate.

(c) Please provide detailed sunk costs to YEC if the project does not proceed.

(d) Does YEC anticipate any delays with respect to the delivery of long-lead equipment orders at this time?

YUB-YEC-3

Reference: Application, page 4
Issue/sub-issue: Engineering design and permitting
Quote: The precise location of each component of the Project will be finalized upon completion of detailed engineering design and permitting by regulators following assessment under the *Yukon Environmental and Socio-economic Assessment Act* ("YESAA").
Preamble: The Board requires further information.

Request:

(a) When will detailed engineering design be completed? Please explain what detailed engineering design entails.

(b) Please provide YEC's expectation as to the length of time it will take to receive the required permits once the YESAA final assessment has been completed.

YUB-YEC-4

Reference: Application, page 2, page 10, page 11 and page 13
Issue/sub-issue: LNG supply
Quote: Yukon Energy has secured an LNG supply of up to 250 m^3 per day for a minimum of five years from Shell Canada's Jumping Pound LNG plant being developed near Calgary and scheduled to start operation before the end of 2014. Yukon Energy also retains the potential during the term of the Shell Canada contract to source LNG from the Fort Nelson area in northern British Columbia should additional liquefaction facilities come into service in this area, and/or Shell Canada arranges to make LNG supplies available in this area.

…

Yukon Energy has secured a minimum five-year (starting from date of first delivery) flexible LNG supply of up to 110,750 kg per day (approximately 250 m^3 per day) from Shell Canada's Jumping Pound production facility being developed near Calgary, which is planned to start operation before the end of 2014 with an estimated capacity of 250,000 metric tonnes per year (i.e., more than 1,500 m^3 per day). LNG costs to Yukon Energy under the contract with Shell

Canada will fluctuate each month to reflect the latest published monthly Alberta Energy Company (AECO) index price of natural gas as reported by the Natural Gas Exchange.
…

With development of more efficient operations with larger and more stable loads, the estimated A-Train delivery cost from Calgary is estimated to fall to 3.7 cents/kWh and from the much closer Fort Nelson area (978 km) the estimated cost would fall to 1.6 cents/kWh. The initial tractors for the LNG haul are assumed to be diesel-fueled engines. To secure lower costs and emissions, ongoing efforts will occur to secure LNG-fueled tractors as soon as they are available commercially in Canada.
…

Yukon Energy is assessing opportunities for coordinating LNG shipping activity with NT Energy and other active and potential northern users of LNG, and YEC also plans an RFP for preliminary design and potential fabrication for the A-Train trailer units in order to address the tight timelines for the Project and the objective to keep delivered LNG costs as low as possible.

Preamble: The Board requires further information.

Request:

(a) Has there been any change to the scheduled start-up date of Shell Canada's Jumping Pound LNG plant? If yes, what is the new date?

(b) If YEC's LNG project has been commissioned for use, are there contingencies in place to address delays respecting Shell Canada's Jumping Pound LNG plant's scheduled start-up date?

(c) Besides Western Copper & Gold, has YEC identified other possible users of LNG that may be able to partner with YEC to help reduce LNG supply chain costs?

(d) Please provide further information respecting "development of more efficient operations".

(e) What is the likelihood of a Fort Nelson area facility being developed? Within what timeframe?

(f) In terms of the price for LNG, YEC stated its contract with Shell prices the commodity based on the AECO index. How is the price on the AECO index adjusted to determine a price based at the Calgary facility?

(g) Would there be a different adjustment to the prices for product acquired in Fort Nelson? Please explain.

YUB-YEC-5

Reference: Application, page 10

Issue/sub-issue: LNG transport

Quote: Significant travel distances and the comparatively low density of LNG (approximately 60% of diesel fuel) emphasize the importance of having the most economical type of transportation possible while maintaining rigorous safety standards. Yukon Energy and Western Copper & Gold contracted PROLOG Canada to work with tractor trailer manufacturers to design a double trailer (A-Train) combination with a 95,000 litre capacity as an alternative to the Tridem units with a 54,000 litre capacity that are currently used to transport fuel into Yukon. The A-Train has been approved for use in Yukon for supply to Whitehorse along the Alaska Highway, but has yet to be approved for use in Alberta or British Columbia.
…

Preamble: The Board requires further information.

Request:

(a) Respecting the contract that Yukon Energy and Western Copper & Gold entered into with PROLOG Canada toward designing a double trailer, please provide:
    i. any contract related costs that YEC has incurred and will be incurring into the future; and
    ii. the terms of reference for the contract.

(b) Are the costs referenced in part (a) included in the estimated LNG project capital costs shown in Table 3-1 of the Application? If not, why not?

(c) Who is responsible for the costs of the RFP for the preliminary design and potential fabrication of the A-Train trailer units? Are any of these costs included in the LNG project cost/benefit analysis?

(d) Please explain how the coordination of LNG shipping with others would work? Would other users have access to the YEC unloading facility? Storage? Vapourization unit?

(e) Considering the displacement assessment shown in Appendix D of the Application, if the LNG project is approved and the LNG units are commissioned and in use, approximately how many trips per month are required by the A-Train scenario and the Tridem units scenario to assure adequate supply of LNG to provide the generation (GW.h/year) shown?

(f) In the event of an Alaska Highway closure are there contingencies in place that allow procurement of LNG from alternative sources? If yes, please explain what these contingencies are. If no, please explain.

(g) Please provide an update respecting the expected timeframe when the A-Train units will be available (fabricated and licensed) to transport LNG fuels.

(h) Please explain how an A-Train unit that has not been designed or fabricated has been approved for use in Yukon along the Alaska Highway? When was that approval obtained?

(i) Please describe the regulatory process and timeframe to get A-Train approval for use in Alberta and B.C.

(j) Will YEC own the A-Trains?

(k) If the answer to (j) is not affirmative, please describe the lease agreement and terms regarding the A-Trains.

(l) Please provide copies of the transportation agreements for both the A-Trains and the Tridem units.

YUB-YEC-6

Reference: Application, page 5 and page 6

Issue/sub-issue: Project components

Quote: 2. Components on Expanded Site Area: Construction and operation of the following components on the Expanded Site Area:

a. LNG truck offloading, storage, and vapourization facilities and related infrastructure, including up to three 166.5 m^3 and two 120 m^3 storage tanks, a short all weather access road from Miles Canyon Road for truck offloading and access to the components on the Expanded Site Area, vapour barrier, fencing and other facilities required for safe operation.

…

4. Utility Trench on the WTGS [Whitehorse thermal generating station] for an underground pipe system between the existing WTGS diesel plant and the facilities on the Expanded Site Area for:

a. Water supply to the Expanded Site Area for fire suppression;

b. Glycol/water heating system to make use of the heat produced by the engines located in the existing WTGS facility; and

c. Natural gas supply for conversion of the existing oil boiler to natural gas, future conversion of existing diesel engines to fuel blend (diesel and natural gas), and/or future installation of new gas or dual fuel engines at the existing WTGS service bays previously used by diesel engines that have been removed.

Preamble: The Board requires further information.

Request:

(a) The Board notes that the expanded site area is to include "up to three 166.5 m^3 and two 120 m^3 storage tanks." If all five storage tanks are not included in the business case, please provide an explanation as how many storage tanks are included in the business case and what size they are.

(b) Is the water supply to the area meant to extinguish a liquid natural gas fire?

(c) Please explain why the utility trench is required to accommodate "natural gas supply for conversion of the existing oil boiler to natural gas?" How is the current oil boiler utilized?

(d) With respect to part (c) of the above quote, is YEC proposing to include in its LNG project proposal (cost/benefit analysis) an underground piping system between facilities on the expanded site and the existing WTGS diesel plant (P126) that, in future, would enable the future replacement of existing diesel generation units to future gas or dual fuel generation units? If yes, please explain the reasons for doing so.

(e) Are the utility trench infrastructure costs shown above included in the Table 3-1 of the Application?

YUB-YEC-7

Reference: Application, pages 15 to 16
Issue/sub-issue: Safety and training/employee complement
Quote: While the consequences of a fire, explosion or cryogenic burn may be high, the likelihood of such an event occurring with such consequences is considered to be extremely low. YEC's existing WTGS operations provide long-term experience addressing such risks related to use of diesel fuel at this site. YEC is required to have measures in place to address such events including an emergency response plan, an updated spills management plan and training for on-site workers and for drivers transporting LNG.

In summary, adverse effects on health and safety related to possible accidents and malfunctions with LNG and natural gas will be addressed through a comprehensive range of well established measures, including application of existing non-discretionary legislation, standards and codes, regulators' responsibility to ensure safety through regulation of the Project, and safety measures being applied by the proponent, including primary containment, secondary containment, safeguard systems and separation distances. Based on these measures, the Project's adoption of a new fuel (LNG and natural gas) will be properly and prudently managed in the same way as current WTGS facilities properly and prudently manage operations with diesel fuel.
…

(Footnote 15) Yukon Energy will also adhere to appropriate LNG storage and transfer protocols such as CSA standard Z276-11 as well as applicable fire prevention codes, and will use equipment that meets or exceeds the safety and industry standards making a spill or unwanted ignition highly unlikely
Preamble: The Board requires further information.

Request:
(a) If the consequences of an event occurring are considered high, how was it determined that the likelihood of such an event occurring is extremely low?

(b) Please identify the impact to the area of a worst-case incident occurring. Were any considerations given for an alternative location for this project? If not, why not?

(c) What expertise does YEC have regarding the handling, storage and vapourization of LNG and what additional operations training might be required for employees to safely operate the LNG equipment?

(d) Will YEC directly hire people with experience in this area or contract out the services?

(e) In the event of a spill or facility explosion, does YEC have an approved emergency response plan that has been considered and accepted by the City of Whitehorse Fire Department?

(f) Please provide the updated measures in place that address the risks related to WTGS diesel and proposed WTGS LNG fuel operations, including an emergency response plan, a spills management plan and training for on-site workers and for drivers transporting LNG.

(g) Please provide a copy of YEC's most recent corporate safety audit.

(h) Please provide examples where YEC will use equipment that exceeds the safety and industry standards.

(i) What does YEC expect in terms of changes to annual insurance premiums regarding the storage and vapourization of LNG and the running of natural gas generation units?

YUB-YEC-8

Reference: Application, page 4
Issue/sub-issue: Necessity
Quote: Projected in-service for the third natural gas-fired unit (4.4 MW) will occur as required to meet grid capacity planning requirements, and is anticipated to be within a few years after the first two units are in-service.

Request:

(a) What is the current project in-service date for the third natural gas-fired unit (the additional 4.4 MW of generation capacity) with WD1 and WD2 remaining in place?

YUB-YEC-9

Reference: Application, page 5 and page 6
Issue/sub-issue: Components on expanded site area
Quote: …including a separate switchgear module, a fluid transfer station, and a small substation to transmit power from the new generating units to the electrical grid via S150 substation.
…

The new small substation in the Expanded Site Area will have quick connect capability for a standby mobile genset in the event that this is required due to loss of connection to S150. Heat to start the vapourizer will be from the glycol/common water loop that will be kept warm year round (using multiple heat sources, e.g., diesel and gas units when operating, and an electric boiler, diesel and natural gas boiler in the diesel plant) to keep diesel and gas gensets on hot standby.
Preamble: The Board requires further information.

Request:

(a) Please provide details regarding the components and component costs of the LNG project substation.

(b) Is the sizing of the small substation predicated on the installation of only the three LNG units or future installation?

(c) Does the LNG substation design afford SCADA control and protection of the units?

(d) With respect to the alternative diesel option — i.e. two 6.7 MW diesel units — are there any incremental substation costs?

(e) Under which item in Table 3.1 are the costs for "quick connect capability for a standby mobile genset" shown?

(f) Does YEC currently have a standby mobile genset in Whitehorse that can be put in place quickly if there is a loss of connection to S150? If not, are the purchase costs of a standby mobile genset included in Table 3.1?

(g) After loss of connectivity with S150, how much time can elapse before the genset is necessary?

YUB-YEC-10

Reference: Application, page 6
Issue/sub-issue: Other site infrastructure
Quote: There are, however, several feasible options for this component including the ditch/depression located just south of the existing main gate or to a site on the west side of Robert Service Way so as to tie into the existing drainage infrastructure maintained by the City of Whitehorse. The final location and design (by an engineer licensed to practice in the Yukon) of the storm water retention pond will be determined in collaboration with the City and applicable regulators as a part of the detailed design to ensure it will be able to handle run off from the Project site and from Robert Service Way.
Preamble: The Board requires further information.

Request:

(a) Please provide an update regarding how close YEC is to completing final location and design of the storm water retention pond.

(b) Are the LNG truck offloading, storage, and vapourization facilities and related infrastructure sized for only the three proposed LNG units? Please explain how future expansion of the LNG facilities is to take place.

(c) Were other locations considered with respect to the LNG truck offloading, storage, and vapourization facilities? If yes, please explain why these sites were not acceptable.

YUB-YEC-11

Reference: Application, page 7
Issue/sub-issue: Final design
Quote: Additional changes to site layout and related components may occur during final design of the Project, subject in each instance to the restrictions that they be confined to the YEC-acquired property area within the Expanded Site Area and the vapour barrier requirements to comply and conform with the requirements of *CSA Standard Z276-11: Liquefied Natural Gas (LNG) Production, Storage and Handling*, as assessed in the vapour dispersion analysis.

Request:

(a) When is final design of the project, per the above quote, expected to be completed?

(b) Has YEC included contingency costs for design changes that may arise with respect to site layout and related components that may arise during final design of the LNG project?

(c) If final design of the project is complete per part (a), please provide additional changes and related costs, if any, to site layout and related components shown in Appendix A.

YUB-YEC-12

Reference: Application, page 7
Issue/sub-issue: Project savings
Quote: This schedule is driven by forecast thermal generation requirements for the winter of 2014/15, both to provide new thermal generation capacity for reliable service during that winter and to save in excess of $2.1 million of thermal fuel generation costs charged to ratepayers in 2015. Cost savings resulting from the Project will benefit all of Yukon's electricity ratepayers.

Request:

(a) Please provide the GW.h of capacity required of WD1 and WD2 for the periods January 1, 2011 to June 30, 2011, January 1, 2012 to June 30, 2012, January 1, 2013 to June 30, 2013 and January 1, 2014 to June 30, 2014.

(b) The $2.1-million savings reflects the "difference between estimated diesel fuel cost of $4.02 million with existing diesel units (based on YEC's 2012/13 GRA compliance filing average diesel fuel generation cost of 28.7 ¢/kW.h.), and $ 1.89 million with new LNG units (based on LNG fuel cost at 13.5 ¢/kW.h with 100% diesel displacement, and assuming A-train LNG transportation is established and an AECO gas price of $4.5 per MMBtu."

   i. Please provide the current average diesel fuel generation cost in ¢/kW.h.

   ii. Please provide the amount of diesel displacement (GW.h).

   iii. Please provide the current AECO gas price ($/Gj).

   iv. Please provide the calculation respecting how YEC obtained the $/MMBtu value to enable comparison of dollars saved in moving from diesel (¢/kW.h) to LNG ($/MMBtu).

(c) Please explain what the $4.4 million estimate for the third unit includes.

(d) Are there any updates to the estimated cost for the third unit at this time?

YUB-YEC-13

Reference: Application, page 24 and page 25
Issue/sub-issue: Project alternatives
Quote: Two diesel generation alternatives to the Project during the 2014-2017 period have been considered: (a) life extension of the Mirrlees units (WD1 and WD2) and (b) replacement of the Mirrlees units with new higher-efficiency diesel engines.

…

YECL proposed, in its recent GRA, a 2 MW new diesel engine on the grid at Carcross at a cost of $3 million.

…

i. Refurbishment of the remaining two Mirrlees units at WTGS (WD1 and WD2) is not considered to be practical or cost effective due to increasing lack of parts for these 45 year old engines.
ii. The Corporation will be able to utilize some of the parts off of the retiring WD1 and WD2 engines...
iii. If parts were not an issue, updated cost assessment for balance of plant work requirements for the WTGS suggest that extending the 9 MW rated capacity of these two units for another 10 years would likely require a capital cost of at least $6.75 million with risks that actual capital costs would exceed this amount.

b. Even if feasible and cost effective, the life extension option for WD1 and WD2 would at most only provide 9 MW of the forecast new capacity requirement and would do this at most for only 10 years, i.e., additional new capacity would be required by late 2016, with at least 4 MW of added capacity needed by late 2017 (to meet capacity requirements in early 2018) and the full 9 MW of new capacity would once again be needed by at least late 2024. The location and costs for this added 4 MW and subsequent 9 MW of capacity would need to be addressed.

…

Assumed capital cost of at least $0.75 million per MW or 50% of the minimum $1.5 million per MW likely for a new unit in an existing facility without extensive balance of plant cost requirements such as are expected to be required at WTGS today. Based on experience, costs today for WD1 and WD2 are expected to materially exceed Yukon Energy's 2008/2009 GRA filing estimates of an expected average cost per MW for Mirrlees unit life extension at Whitehorse of approximately $0.482 million/ MW including provision for common upgrade costs required.

Request:

(a) Please provide the business cases and analyses undertaken regarding the life extension of units WD1 and WD2 relative to replacing the units with new diesel units and to the proposed LNG project.

(b) If maintenance is an issue with units WD1 and WD2, please provide the maintenance history of these units for the years 2005 to 2013 inclusive. Please provide a table of capital expenditures for <u>each</u> of WD1 and WD2 for the years 2005 to 2013 inclusive.

(c) YEC submits that the "…updated cost assessment for balance of plant work requirements for the WTGS suggest … $6.75 million."[2] Please provide a table, similar to Table 3-1 which provides a summary of the cost items, and explanations regarding the cost items which make up the "balance of work requirements" for the WTGS.

(d) Considering that WD1 andWD2 are scheduled to be decommissioned by 2015, is the WTGS "balance of plant work" required?

(e) If available, please provide an assessment report for the WTGS facility.

2. Application, page 25, a. iii.

(a) Please contrast this conclusion with the recommendation made in the 2006 YEC 20-Year Resource Plan and explain any differences between the conclusion and the recommendation.

(b) Please explain this change in comparison to the requested deferred overhaul expenditures of $0.18 million to the end of 2011, $1.28 million for 2012 and $1.60 million for 2013 in YEC's 2012-2013 GRA.

(c) Please explain YEC's change in position regarding the refurbishment of the Whitehorse Mirrlees units as cited in paragraph 210 (page 42) of Appendix A to Board Order 2009-8.

(d) Please provide further justification of the change in estimates for the refurbishment of the Whitehorse Mirrlees units from a cost of $0.482 million/MW in YEC's 2008-09 GRA to costs of at least $0.75/MW in this Application.

(e) Why did YEC not undertake the refurbishments of WD1 and WD2 at an earlier date? Please explain.

(f) As part of the WD3 refurbishment, did YEC upgrade the facilities for the WD units?

(g) Please explain the WD3 refurbishment. How long was the life of WD3 expected to be extended? What was the total cost of the WD3 refurbishment?

(h) If refurbishment of the WD1 and WD2 units extended the life for those units an additional 10 years, would this option allow sufficient time for alternative projects to proceed?

YUB-YEC-14

Reference: Application, page 24 and page 26
Issue/sub-issue: Higher-efficiency diesel engine replacement option
Quote: YECL proposed, in its recent GRA, a 2 MW new diesel engine on the grid at Carcross at a cost of $3 million.
…
For comparative purposes, an alternative has been examined assuming two new 6.7 MW diesel engines (13.4 MW), with the first unit installed in late 2014 at an estimated capital cost of $22.5 million … and the second unit installed in late 2015 at an estimated capital cost of $11.0 million ...

Preamble: The Board requires further information.

Request:

(a) Can YEC explain why its estimate regarding the installation costs of two high-efficiency 6.7 MW diesel replacement units, the first at $22.5 million and the second at $11.0 million, are significantly greater than the 2 MW unit that YECL proposed, in its recent GRA, to install at Carcross for $3 million.

(b) Footnote 38 refers to "40% efficiency". How valid is that assumption in terms of the proposed new diesel units?

(c) With respect to the new higher efficiency diesel option, please provide details regarding what the estimated $22.5 million capital cost, related to the installation of the first unit, is comprised of. Please provide a table similar to Table 3.1, which lists the detailed cost items, and also provide an explanation regarding each component item in the table.

(d) Similar to question (a), please provide explanation regarding the component costs and a table listing the cost items that make up the $11.0 million capital cost related to the installation of the second unit.

YUB-YEC-15

Reference: Application, page 27, footnote 42
Issue/sub-issue: GE pre-engineered J624 modular units
Quote: Review of potentially available modular unit options indicated that GE is the only vendor currently offering such gas fired options in the scale relevant to Yukon Energy and with demonstrated cold climate northern operating experience.
Preamble: The Board requires further information.

Request:

(a) Please describe the process that YEC undertook to review/investigate the modular LNG generating unit options to choose from.

(b) Please provide criteria that YEC made use of to inform its decision to choose the three J624 modular 4.4 MW units versus a larger size of unit.

(c) Please provide a list of alternative modular units considered and reasons for not opting for that particular model of LNG unit.

(d) What additional information can YEC provide that demonstrates these units are proven in cold climate northern operations? For instance, at which locations in northern climates are such units located, in what quantities (unit numbers and total MW at each location) and for how long have these units been operating on LNG? What problems have been encountered in their operations and what additional costs have be incurred in their operation?

(e) What investigation did YEC undertake to ensure these units are suitable for use in northern climate operations and that no unknown problems or additional costs would be encountered in their installation and operation?

YUB-YEC-16

Reference: Application, page 11 and page 35

Issue/sub-issue: LNG fuel cost savings

Quote: Assuming 40% energy conversion efficiency at a minimum for the modular gas-fired engines, the initial low volume LNG haul cost to Whitehorse from Shell's Calgary facility (2,325 km) is estimated at 4.4 cents/kWh with A-Train units and 6.3 cents/kWh with Tridem units.

…

Table 4-5: Range of LNG Fuel Cost Savings Examined

LNG Fuel Cost Saving ($/kW.h)		
New Diesel LNG		LNG Saving
	A-Train from Calgary with 18% premium	
0.246	0.115 gas at $3.5/MMBTu, efficiency 44%	0.131
0.200	0.115 gas at $3.5/MMBTu, efficiency 44%	0.085
0.246	0.135 gas at $4.5/MMBTu, efficiency 40%	0.111
0.200	0.135 gas at $4.5/MMBTu, efficiency 40%	0.065
	Tridem from Calgary with 10% premium	
0.246	0.133 gas at $3.5/MMBTu, efficiency 44%	0.113
0.200	0.133 gas at $3.5/MMBTu, efficiency 44%	0.067
0.246	0.154 gas at $4.5/MMBTu, efficiency 40%	0.092
0.200	0.154 gas at $4.5/MMBTu, efficiency 40%	0.046

Preamble: Additional information regarding the impact of assumed efficiencies is needed

Request:

(a) How valid is the 40% energy conversion assumption? Please provide confidence intervals for that assumption.

(b) Please provide the detailed calculations in electronic format, as to how the 4.4 cents/kw.h for the A-Trains and the 6.3 cents/kw.h for the Tridem units are calculated.

(c) Please determine the range of LNG fuel cost savings, as shown above, using efficiencies of 30 and 35 percent.

YUB-YEC-17

Reference: Application, page 48
Issue/sub-issue: Design modification risks
Quote: Yukon Energy does not anticipate material risks of major design modifications resulting from regulatory approvals and review process for this Project. The proposed Project will be built using conventional construction technologies suited for northern climate conditions, and following all applicable construction and design practices for works of this nature, including building and electrical codes and adhering to industry best practices. The technologies employed in the Project for the LNG facilities and the GE J624 modular gas-fired engines are industry standard in all material respects and proven in northern climate conditions. The Project will also adhere to all applicable national and territorial standards used in the design of all Project components.

Stringent standards and regulations for design, construction and operation for LNG transport, storage and vapourization facilities have developed over the last 40 years to prevent accidents and minimize the adverse impacts of events. LNG facilities must meet all standards, codes and regulations enforced by federal, provincial/ territorial or municipal jurisdictions. Accordingly, no special added costs are anticipated at this time to be required for the Project to comply with anticipated material conditions in approvals or permits.

The major regulatory risk for the Project remains material delays in schedule which could adversely affect Project costs and benefits for ratepayers starting in winter 2014/15.
Preamble: The Board needs further information.

Request:

(a) Does YEC anticipate design modifications resulting from the YESAB review?

(b) Please provide additional information that shows the technologies employed in the project for the LNG facilities and the GE J624 modular gas-fired engines are industry standard.

(c) Please explain what constitutes "material delays in schedule." Has YEC included contingency costs in its proposal to account for delays that may adversely affect LNG project costs?

(d) Please provide examples of industry best practices respecting LNG projects YEC is referring to in the above quote.

(e) Please provide examples of LNG facilities that have developed over the last 40 years.

(f) Are added costs anticipated at this time?

YUB-YEC-18

Reference: Application, page 4 and 14
Issue/sub-issue: Summary description
Quote: The precise location of each component of the Project will be finalized upon completion of detailed engineering design and permitting by regulators following assessment under the *Yukon Environmental and Socio-economic Assessment Act* ("YESAA").
The Project lies within the Traditional Territory of the Kwanlin Dün First Nation ("KDFN") and the Ta'an Kwäch'än Council ("TKC"). In May 2012, TKC and KDFN were invited to become partners in assessing the feasibility of using LNG as a fuel source in Yukon and agreed to co-develop a Partnership Committee with terms of reference and signed confidentiality agreements completed July 2012. Regular partnership meetings have been held since July 2012, focused on review of the business case, establishing a good working relationship and making substantive progress toward developing economic and business opportunities for the two First Nations relative to the Project. This has also included discussion regarding a possible investment in the Project by TKC and KDFN through negotiation of a Partnership Agreement**.**
…
Other positive effects include the potential for local jobs and business activity during the construction period (including opportunities for KDFN and TKC), savings for Yukon ratepayers compared to what would be required with continued reliance on diesel generation, and potential business and employment opportunities for KDFN and TKC.

Preamble: The Board requires further information.

Request:

(a) Considering that detailed engineering design is yet to be finalized, how accurate are YEC's forecast LNG project costs in terms of +/- percentages?

(b) Would YEC consider a deferral account to protect its customers from cost overruns?

(c) Please provide updates regarding the discussions with the two First Nations' possible investment in the LNG project through negotiation of a partnership agreement.

(d) If a partnership agreement has been entered into with the two First Nations, please provide the terms of reference and detail the cost impacts, if any, to customers.

(e) Have the costs related to the partnership agreement been taken into account respecting the cost/benefit analysis of this project?

YUB-YEC-19

Reference: Application, page 29 and page 32, Table 4-3
Appendix D, Tables D-1 and D-2
Appendix C, Table C-2

Issue/sub-issue: Ratepayer Impacts

Quote: The annual fuel cost estimates in Table 4-3 assume long-term average thermal generation requirements are supplied with the new and more efficient gas or diesel generation units being operated on a prioritized basis where feasible to maximum capacity prior to use of any other grid diesel generation. The annual fuel costs estimates in Table 4-3 also assume operation of these new units to enhance hydro storage use in wintertime (so that enhanced hydro generation can help displace diesel generation during periods of peak diesel requirements).

Preamble: The Board seeks clarification of this statement both with respect to the use of new gas or diesel units to enhance hydro storage use in wintertime and its effect on fuel costs.

Request:

(a) How does YEC propose to operate new gas or diesel units in a manner that would enhance hydro storage use in wintertime? Specifically refer to the values in the tables in Appendices C and D in your discussion, using the actual plant capacities proposed for both the LNG and new diesel projects in the sequence proposed (13.2 MW for LNG and 13.4 MW for new diesel).

(b) What is the cost in each case in each of the years 2015 to 2018 to achieve this benefit?

(c) Please explain how the amount and value of enhanced hydro was calculated and incorporated into Table 4-3. Please provide a table showing the calculations.

(d) In Table 4-3, how were the values for fuel displacement arrived at, given there is no reference to 2018 in Appendix D?

(e) What might be the opportunities for LNG or new diesel unit operation to enhance hydro storage use in wintertime beyond 2018 to 2020?

YUB-YEC-20

Reference: Application, page 8, Table 3-1, footnote 1, and page 25

Issue/sub-issue: Ratepayer Impacts

Quote: This work to decommission WD1andWD2 ($1.45 million) is expected to occur in summer 2015; all other work is expected to be completed before the end of 2014.

Request:

(a) Once these units are decommissioned and salvaged, what does YEC propose to do physically with these units?

(b) What salvage value will these units have, either in whole or in parts? Will that value be allocated back to ratepayers? If yes, how will it be allocated?

(c) Is any of this salvage value reflected in Table 4-3? If so, where and how?

YUB-YEC-21

Reference: Application, page 24 and page 25
Issue/sub-issue: Project alternatives
Quote: The current situation differs from that reviewed in many respects, including current forecasts for grid diesel generation as well as updated assessments of the practicality and cost requirements for this option.

Based on the Corporation's recent experience with refurbishment and subsequent maintenance of the WD3 Mirrlees in Whitehorse and FD1 Mirrlees in Faro, the following have been concluded...

Preamble: On pages 24 and 25, in Section 4.2.3 - Diesel Generation Alternatives to the Project, YEC discusses the issue of life extension of WD1 and WD2.

Request:

(a) Please provide further discussion of the specific physical and cost issues that lead YEC to conclude that it is impractical and not cost effective to carry out a life extension of WD1 and WD2.

(b) Please provide details regarding YEC's plans to utilize some of the parts off the retiring units to keep WD3 and FD1 operating through to currently planned retirement dates.

(c) Please provide details regarding YEC's statement that if parts were not an issue, a life extension for WD1 and WD2 would cost $6.75 million.

(d) Why is there a risk that the capital costs would exceed the $6.75 million? What forms the basis for this statement?

(e) What forms the basis for the per-MW cost estimates cited in footnote 32, at the bottom of page 25, both for existing and new units?

YUB-YEC-22

Reference: Application, page 32, Table 4-3,
Issue/sub-issue: Capital costs

Request:

(a) Can YEC confirm that the capital costs cited in Table 4-3 for the initial cost of each alternative includes the $1.45 million salvage costs of the WD1 and WD2 units cited in footnote 1 of Table 3-1 on page 8? What about the $0.3 million in BOP-Preliminary Assessment costs cited in Table 3-1 itself?

(b) Can YEC clarify what costs are included in BOP-Preliminary Assessment?

(c) Can YEC confirm that both of these costs are capitalized in Table 4-3 under the year 2014 and a return on those costs is included in both of the lines “Return Diesel (new)” and “Return LNG” for the years 2015 through to 2018?

YUB-YEC-23

Reference: Application, page 26
Issue/sub-issue: Project alternatives
Quote: For comparative purposes, an alternative has been examined assuming two new 6.7 MW diesel engines (13.4 MW)...

Request:

(a) Can YEC confirm that the two diesel units cited for comparative and cost purposes are in fact the 6.7 MW Wartsila dual fuel engines cited in footnote 35 at the bottom of page 26?

(b) What additional capital costs are associated with the selection of a dual fuel engine for comparative purposes, both in terms of the engine itself and any additional associated plant requirements?

(c) In the costing of the new diesel alternative, were any additional costs associated with running the proposed units on LNG included?

(d) Referring to footnote 35 at the bottom of page 26, why would these units be selected to replace WD1 and WD2?

YUB-YEC-24

Reference: Application, page 23
Issue/sub-issue: Project alternatives
Quote: However, retention of the WD1 and WD2 Mirrlees units beyond planned retirement would expose all grid customers to unreliable generation capacity as well as higher O&M fuel costs, and replacement or life extension of these units would be required in any event as soon as feasible, i.e., by late 2015 at the latest.

Exposure of grid customers to unreliable generation that fails to meet the grid reserve capacity planning criteria, as would occur with this option, is not acceptable to Yukon Energy.

Request:

(a) Why does YEC assert that the two existing WD1 and WD2 units are unreliable and their retention in their current condition, even in the short term, i.e. through 2015, is unacceptable?

(b) What evidence can YEC present from their operations and maintenance records that demonstrate such unreliability?

(c) In terms of grid reserve capacity planning criteria (with no retirement of WD1 and WD2 and without either of the LNG or new diesel options):

i. given YEC's current baseload forecast, does the need for additional new capacity occur at the beginning of 2016?

ii. does the retention and operation of theWD1 and WD2 units over the winter of 2014-2015 meet the grid reserve capacity planning criteria?

iii. depending on the accuracy of the baseload forecast, is it possible that the retention and operation of the WD1 and WD2 units might still meet that criteria beyond the start of 2016, given the magnitude of the projected deficiency in capacity at the beginning of 2016?

YUB-YEC-25

Reference: Application, page 4 and page 8
Issue/sub-issue: Project scope
Quote: Two natural gas-fired units (8.8 MW total capacity) are anticipated to be in service Q4 2014 to provide capacity and fuel cost savings during the winter of 2014/2015. Projected in-service for the third natural gas-fired unit (4.4 MW) will occur as required to meet grid capacity planning requirements, and is anticipated to be within a few years after the first two units are in service.
…
Yukon Energy does not at this time have firm pricing for the third GE natural-gas fired generating unit – the $4.4 million estimate continues to be the best available information at this time.
Preamble: Clarification about the scope of the project is sought.

Request:

(a) Can YEC clarify whether the scope of the project includes the third 4.4MW natural gas-fired unit to be installed at an undetermined date beyond the end of 2014?

(b) If the installation date and the cost of the third unit are as yet undetermined, why should the Board consider approval of the third unit and any associated facilities within the scope of the applied-for project?

YUB-YEC-26

Reference: Application, page 26
Issue/sub-issue: Project capital costs
Quote: For comparative purposes, an alternative has been examined assuming two new 6.7 MW diesel engines (13.4 MW), with the first unit installed in 2014 at an estimated capital cost of $22.5 million ...and the second unit installed in late 2015 at an estimated capital cost of $11.0 million ...

Request:

(a) Provide a table similar to Table 3-1, shown on page 8 that gives a breakdown of the $33.5 million in capital costs of the new diesel development alternative discussed in the Application.

(b) Discuss the main differences in each of the cost components between the tables for the LNG and the new diesel case.

YUB-YEC-27

Reference: Application, page 8
Issue/sub-issue: Project capital costs

Request:

(a) Please provide a version of Table 3-1 that shows a breakdown of the complete capital cost ($38.8 million) of the project, including the third gas-fired unit.

(b) Please provide a version of Table 3-1 that shows a breakdown of the current estimate of the capital cost ($4.4 million) of the third gas-fired unit by itself.

(c) What is the capital cost on a per-MW basis of the total $38.8 million of the project, similar to the $3.9 million cited in the second paragraph on page 8?

YUB-YEC-28

Reference: Application, page 8, Table 3-1,
Issue/sub-issue: Project capital costs
Preamble: In Table 3-1, page 8, YEC cites the costs of the LNG Gen - Engines as being $11.4 million, which if divided by two, gives a cost of $5.7 million per unit. When compared to the $4.4 million capital cost cited to install the third unit by itself, these costs on a per-unit basis are $1.3 million higher.

Request:

(a) What accounts for this difference in cost between the first two units and the third unit?

(b) Are there any financial advantages to buying all three units at the same time? If so, please explain.

YUB-YEC-29

Reference: Page 40, Capital cost increase risks and other construction risks
Issue/sub-issue: Project capital costs
Quote: The GE Engines are the largest cost component for the Project (33% of the total WTGS capital costs) - there is a high degree of certainty regarding this cost component as Yukon Energy has entered into an EPC contract with GE/Gas Drive to engineer, build, deliver and install the units (including related switchgear) on site.

YEC is also concluding at this time contract arrangements related to the key LNG facilities equipment, including storage tanks and vaporizer.

Request:

(a) Were the contracts for the LNG generators, the storage facilities, the vaporizer and each component's installation tendered? If they were not tendered, explain why not?

(b) If they were tendered, please provide details of the tendering process, including pricing received and names of all bidders.

YUB-YEC-30

Reference: Application, pages 21 and 22 and Table 4-2 and
Appendix C - Table C-4, page C-8

Issue/sub-issue: Forecast new grid capacity requirement

Preamble: Table C-4, for the Base Case no Alexco, shows the N-1 Surplus (shortfall) (MW) forecast for the years 2013 to 2020. Reference is made to those numbers in Table 4-2 and in the paragraph immediately below Table 4-2 on page 22.

Table C-4 and Table 4-2 show a 7.0 MW deficiency for 2015 and a 13.0MW deficiency for 2018 respectively, while the discussion in the paragraph following Table 4-2 speaks of that same capacity being required in late 2014 and 2017 respectively.

Request:

(a) Please clarify the timing of the need for new capacity in terms of when in the year cited new capacity is needed — i.e. the beginning or end of the year, based on the N-1 criteria.

(b) Please provide a table similar to Table 4-2 that shows the need for new capacity in each of the years from 2015 to 2020 based on Table C-4.

(c) Given that Table C-4 appears to show a need for additional new generating in 2017 (i.e. 10.9MW- 8.8MW = 2.1MW shortfall), why hasn't YEC chosen to apply for the commissioning of the third LNG unit during 2016, for the beginning of 2017?

YUB-YEC-31

Reference: Application, Table 4-3, page 32
Appendix C, Table C-2, page C-5

Issue/sub-issue: Ratepayer Impacts

Request:

(a) Please confirm that the numbers shown for Forecast Diesel (GW.h) (underneath each of the columns for 2015 to 2018) in Table 4-3, as part of the Annual Fuel Cost calculation are taken from Table C-2, page C-5, Appendix C.

YUB-YEC-32

Reference: Application, page 36

Issue/sub-issue: LNG capital cost sensitivity

Quote: Table 4-6: Ratepayer Cost Savings Sensitivity to Project Capital

Costs and Fuel Cost Saving Risks

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

	0.474	**0.626**	**0.779**	**0.932**	**1.085**
	Table 4-3	plus 5%	plus 10%	plus 15%	plus 20%
LNG Fuel Cost Saving ($/kW.h)					
0.13	3.6	4.8	6.0	7.2	8.3
0.11 Table 4-3	4.3	5.7	7.1	8.5	9.9
0.09	5.3	7.0	8.7	10.4	12.1
0.07	6.8	8.9	11.1	13.3	15.5
0.05	9.5	12.5	15.6	18.6	21.7

Preamble: The Board requires further information regarding cost savings sensitivity of the project.

Request:

(a) Please provide Table 4-6 in an Excel spreadsheet with all formulas intact and explanations about the contents of the cells and directions to users as regards to using the spreadsheet in determining cost savings sensitivities shown in the Table 4-6 and otherwise.

YUB-YEC-33

Reference: Application, page 5, page 27 and page 31
Issue/sub-issue: Project components
Quote: a. LNG truck off loading, storage, and vapourization facilities and related infrastructure ...

Concurrent with the modernization and diesel unit replacement needs today at the Whitehorse Diesel Plant, there is an opportunity to convert from diesel to LNG-supplied gas-fired generation to meet growing electricity loads on the Yukon grid with a fuel that is cleaner burning and cheaper than diesel, benefitting both the environment and Yukon ratepayers.
In order to secure similar diesel displacement without requiring incremental new generation, Yukon Energy is also examining (for a future stage of the Project) retrofit of the remaining EMD units at Whitehorse to a blended use of gas and diesel during the few times when new gas-fired engines would not be fully able to displace all diesel generation.

Request:

(a) What role do the vapourization facilities play in the operation of the LNG units? How do they function and what are their components?

(b) What is the capacity of the proposed vapourization facilities and how does that capacity and its sizing relate to the needs of the first two LNG units, the third LNG unit and any possible future expansion of LNG use at this location (such as the conversion of existing EMD units as referred to at the top of page 31)?

(c) Does the sizing of the vapourization facilities take into consideration and any other possible developments at the Whitehorse site (such as the possible future installation of dual fuel gas-diesel units such as the Wartsila diesel units cited as an alternative to the proposed LNG units)?

(d) How does the sizing of the vapourization facilities affect the sizing of the piping systems to be installed in the utility trench?

(e) What difference in cost would there be for the vapourization facility if sized to handle the three proposed LNG units only and the facility sized as currently proposed? What difference in cost would there be with respect to the sizing of the piping systems in the utility trench?

(f) Are there any other facilities proposed as part of this project that are sized beyond the immediate needs of the project? If so, what are they and what is their additional cost as compared to sizing related to the project's immediate needs?

(g) If there is a difference in vapourizer sizing and cost and in the piping systems from that needed for just the three proposed LNG units or for any other such additional costs, what justifies spending any extra capital on these facilities at this time?

YUB-YEC-34

Reference: Application, page 11
Issue/sub-issue: Fuel efficiency
Quote: …the delivered cost of Shell Canada-supplied LNG at Whitehorse would be less than 15.5 cents/kWh (assuming 40% minimum average fuel conversion efficient).
Preamble: The Board requires further information.

Request:

(a) What are the manufacturer's minimum guaranteed unit heat rates for each of the GE J624 and Wartsila 6.7 MW units?

(b) What unit efficiency does that translate to for each unit?

(c) Why were unit efficiencies of 40% and 44% chosen for comparison purposes?

YUB-YEC-35

Reference: Application, page 5
Issue/sub-issue: Project Facilities

Request:

(a) How does YEC intend to deal with boil-off gas from its LNG installation?

(b) What facilities does it intend to install to deal with the boil-off gas and what are the costs of those facilities?

(c) Please provide the expected quantity of boil-off gas generated by the LNG installation on a month-by-month basis, both with the two-unit and three-unit developments.

(d) Please provide details of the use of this gas on a month-by-month basis for both the two- and three-unit developments

(e) Will any of this boil-off gas be replacing electricity as a source of energy? If so, please provide details.

YUB-YEC-36

Reference: Application, page 27, footnote 40
Section 4.2.4, pages 30 and 31
Issue/sub-issue: Project economics
Quote: Percent displacement of other diesel estimates based on analysis provided in Appendix D. Actual displacement likely to be less than these estimates given the assumptions adopted in Appendix D to assess maximum potential displacement with full utilization of the new capacity.

Request:

(a) What assumptions were made with respect to operation of existing diesel units in the YECSIM model and why were they made?

(b) What operational reasons would there be to operate existing diesel units despite the installation of the proposed LNG generation?

(c) For a case similar to the one adopted in the YECSIM model, by how much (in GWh) might existing diesel usage for operations reduce the amounts claimed for the proposed LNG generation in each of the years 2015 through to 2018?

(d) Given those amounts of existing diesel use, what would be the reduction in fuel cost savings claimed for each of the years 2015 through to 2018 as shown in Table 4-3 on page 32?

(e) Is it reasonable to accept the results of the YECSIM model as evidenced in Appendix D for purposes of YEC's economic analysis without some discounting of the benefits claimed? If the answer is yes, please explain why.

YUB-YEC-37

Reference: Application, page 1
Issue/sub-issue: Modernization of the Whitehorse Thermal Generating Station
Quote: The Project will modernize Yukon Energy's WTGS to meet growing requirements for reliable and flexible thermal generation on the Yukon grid, with conversion of WTGS thermal generation units scheduled for retirement from diesel fuel to cheaper burning and cleaner natural gas fuel supplied by liquefied natural gas ("LNG") delivered by truck from Alberta or British Columbia.

Request:

(a) The Board notes YEC's submission that the proposed LNG project "will modernize Yukon Energy's Whitehorse Thermal Generation Station." Did YEC consider other locations for the project outside the Whitehorse area, wherein the related small substation could connect to the 35 kV distribution/transmission line?

(b) Were any of the Whitehorse diesel engines recently refurbished? If so, please identify which units were refurbished.

(c) Please provide a 10-year capitalization history (2003-2013), by unit, for each of the existing Whitehorse diesel units.

YUB-YEC-38

Reference: Application, page 5
Issue/sub-issue: Generating Units
Quote: Planned in-service for the first two natural gas-fired units (8.8 MW) is in fourth quarter 2014, …

Request:

(a) Please provide the forecast generation for the two new natural gas-generating units for the last quarter of 2014 and for 2015.

(b) Please provide the forecast energy consumption for the natural gas-generating units for the years 2014 to 2020 inclusive. Clearly state your assumptions which support that forecast.

YUB-YEC-39

Reference: Application, page 5, footnote 5
Issue/sub-issue: Storage
Quote: The revised Project plan retained the three gas-fired units for the Project (two to be developed in 2014), with provision for three initial LNG storage tanks (499.5 m^3 for a total of 6 days storage) and the potential to add in future two additional smaller storage tanks (240 m^3) to retain 6 days storage with the third gas-fired module.

Request:

(a) Please provide the MW.h conversion of 499.5 m^3 of LNG.

(b) Are the proposed natural gas units expected to be baseload or peaking units?

(c) In terms of merit order, will the natural gas units be dispatched ahead of the Whitehorse diesel units? All other diesel units?

YUB-YEC-40

Reference: Application, page 6, footnote 6
Issue/sub-issue: Heat to start vapourizer
Quote: Heat to start the vapourizer will be from the glycol/common water loop that will be kept warm year round (using multiple heat sources, e.g., diesel and gas units when operating, and an electric boiler, diesel and natural gas boiler in the diesel plant) to keep diesel and gas gensets on hot standby.

Request:

(a) Please provide the forecast incremental costs of the heat required to start the vapourizer and to keep the diesel and gas gensets on hot standby for the years 2014-2020 inclusive.

YUB-YEC-41

Reference: Application, page 7
Issue/sub-issue: Decommissioning of units WD1 and WD2
Quote: 5. Decommissioning of two Mirrlees Diesel Units (WD1 and WD2) in the existing WTGS, including ancillary equipment and disconnection from the electrical grid.

Request:

(a) Do the decommissioning costs include net salvage of the two WD units and any site reclamation costs? Please explain.

(b) To December 31, 2013, what is the NBV of WD1 and WD2?

YUB-YEC-42

Reference: Application, page 11, and page 7, footnote 7.
Issue/sub-issue: Economic Assumptions
Quote: This schedule is driven by forecast thermal generation requirements for the winter of 2014/15, both to provide new thermal generation capacity for reliable service during that winter and to save in excess of $2.1 million[7] of thermal fuel generation costs charged to ratepayers in 2015.

Estimated based on long-term average thermal generation of more than 14 GW.h for Base Case load forecast (no Alexco) over the six month period from January 1, 2015 to June 30, 2015; reflects the difference between estimated diesel fuel cost of $4.02 million with existing diesel units (based on Yukon Energy's 2012/13 GRA Compliance Filing average diesel fuel generation cost of 28.7 c/kW.h), and $1.89 million with new LNG units (based on LNG fuel cost at 13.5 c/kW.h with 100% diesel displacement, and assuming A-train LNG transportation is established and an AECO gas price of $4.5 per MMBtu).

Request:
(a) Is the Alexco mine currently operating? If so, please redo the analysis showing the inclusion of the Alexco mine.

(b) Does the base case load forecast include the Whitehorse Copper load in 2015? What is the effect if that load is included? Please show the analysis.

(c) What is the current cost of diesel fuel?

(d) What is the current cost of LNG fuel?

(e) Does the fuel price comparison include the capital costs of the LNG project? If not, please show the analysis of the comparison, including the amortization of the capital costs.

YUB-YEC-43

Reference: Application, page 7
Issue/sub-issue: Average annual utilization
Quote: New natural gas-fired engines are assumed to have an economic life of 40 years, based on expected average annual utilization of these assets.

Request:
(a) Please provide the assumed average annual utilization of <u>each</u> of the natural gas units in terms of operating hours/year and MW.h of generation/year for the years 2014-2020 inclusive.

YUB-YEC-44

Reference: Application, page 7
Issue/sub-issue: Transportation costs
Quote: Truck delivery of LNG to the WTGS will use a new double trailer (A-Train) combination with a 95,000 litre capacity, although currently available Tridem units with a 54,000 litre capacity may be used initially if there are delays in the licensing and/or fabrication of the new A-Train units.

Request:
(a) Please provide the cost differential in $/litre comparing the A-Train costs versus the Tridem delivery costs.

YUB-YEC-45

Reference: Application, page 8
Issue/sub-issue: Project costs
Quote: Table 3-1 provides a summary of the estimated Yukon Energy capital costs of $34.4 million (approximately $3.9 million per MW) for the initial Project facilities at the WTGS to be completed prior to the end of 2014, including the first two gas-fired units and other work related to LNG facilities (truck offloading, storage, and vapourization), distribution and communication line, utility trench, and decommissioning of the two Mirrlees diesel units. These costs are preliminary estimates developed in mid-2013 based on preliminary quotes and preliminary engineering. (Underlining added)

Request:

(a) Please provide the expected range of costs from preliminary to actual using confidence intervals.

(b) What is the decision point in terms of capital costs where the project should not proceed?

(c) What is the decision point in terms of rising prices for liquid natural gas or declining cost of diesel fuel where the project should not proceed?

(d) Is there a further update to the preliminary costs?

(e) Is the owner of YEC willing to accept as a cost to the shareholder any cost overruns from the preliminary engineering estimates?

(f) Please provide the detailed NPV model in Excel format that compares the LNG installation (3 generators) to a complete new diesel replacement. Please include all assumptions and explain the results.

(g) What is the impact of this project on the proposed DCF and ERA modifications as requested by YEC?

(h) Prepare a sensitivity analysis that show the point of comparability in the DCF based on stable diesel prices but increasing LNG prices on an NPV basis.

YUB-YEC-46

Reference: Application, page 9
Issue/sub-issue: Capital costs
Quote: Capital costs associated with the installation of the gas-fired generation units at Whitehorse are incrementally higher than would be required with new diesel generation units, due primarily to the requirement to develop related LNG storage, vapourization and truck offloading facilities. However, lower fuel costs of LNG compared to diesel generation yield material net fuel cost savings each year with the Project compared to the new diesel generation alternative.

Request:

(a) Please provide an electronic version of the business case with formulae intact showing the above analysis.

YUB-YEC-47

Reference: Application, page 11 and 12
Issue/sub-issue: Anticipated timelines
Preamble: On page 12 of the Application, YEC states that the public comment on the revised project proposal is to conclude on December 20, 2014.

Request:

(a) As the date noted in the preamble is around the proposed in-service date for the project, is the date a typographical error?

YUB-YEC-48

Reference: Application, page 19, footnote 20
Issue/sub-issue: West Creek hydro
Quote: Yukon and Alaska recently signed an Economic Development Agreement with provision to look at the feasibility of transmission line connection between Skagway and the Yukon grid, including potential support for development of West Creek hydro.

Request:
(a) Where does West Creek hydro fall within the planning horizon of YEC?

(b) What must YEC accomplish for West Creek hydro to proceed? What criteria must be met?

YUB-YEC-49

Reference: Application, page 24, footnote 28
Issue/sub-issue: Techo Wind Farm
Quote: … Yukon Energy is also pursuing a 20 MW wind farm at Techo (also known as Ferry Hill) in the Stewart Crossing area …

Request:
(a) Please provide further information regarding the pursuit of this wind farm.

(b) If YEC decided to go ahead with the wind farm, what would be the timing from that decision point to actual wind generation?

(c) How would the costs for this project compare to the costs for the LNG option?

YUB-YEC-50

Reference: Application, page 30
Issue/sub-issue: Hydro storage
Quote: Operation of the new gas-fired generation capacity can be used, however, to assist in storing water at Aishihik and (to a much lesser extent) at Mayo during summer or other periods when thermal generation requirements are low, thereby allowing added hydro generation capability to be utilized in peak winter months …

Request:
(a) Does the above quote imply that thermal generation would displace hydro generation in the summer, which, in the end would displace thermal generation in the winter? Please show any cost/benefit analysis to support such a statement.

YUB-YEC-51

Reference: Application, page 32, Table 4.3
Issue/sub-issue: Ratepayer impacts

Request:
(a) Are other non-capital costs considered in the comparison, such as the handling, storage and vapourization of the LNG? Please explain.

YUB-YEC-52

Reference: Application, page 33
Issue/sub-issue: Risks
Quote: Risks that increase annual capital cost charge penalties from the Project, for example: higher than assumed Yukon Energy capital costs of $38.8 million for the Project (which could reflect a wide variety of potential factors, including costs arising from delays), faster than assumed depreciation of these capital costs, and/or higher than assumed YEC annual costs of capital (costs for debt and equity) …

Request:
(a) Please explain how the 40-year depreciation life was determined and provide all assumptions inherent in that estimate.

YUB-YEC-53

Reference: Application, page 33
Issue/sub-issue: Risks
Preamble: Page 33 of the Application discusses risk cases where capital costs are higher than proposed and where there are reductions in annual fuel price savings.

Request:
(a) Please provide a similar analysis where forecast diesel generation is less by 5%, 10%, 20% and 25%.

YUB-YEC-54

Reference: Application, page 40
Issue/sub-issue: Capital cost risks
Quote: Capital cost increase risks and other construction risks – May be expected for any project of this nature, location, and stage of development.

Request:
(a) Please explain what YEC has done to determine the price, and therefore reduce the risk of cost overruns, for the natural gas generators, the unloading facility, the storage tanks and the vapourization unit.

YUB-YEC-55

Reference: Application, page 40
Issue/sub-issue: LNG fuel cost risks
Quote: LNG Fuel Cost Risks – There is a risk that the assumed annual fuel cost savings with LNG compared to the new diesel alternative may be reduced due to changing market conditions (affecting the price of LNG compared to diesel), differences in efficiency, or due to increased LNG transportation costs (e.g., due to requirement to rely on Tridem trailers for transport in initial years due to A-Train trailers not being permitted for available and/or increased costs due to lower initial loads).

Request:
(a) What analysis has YEC undertaken to test correlations and trends between LNG costs and diesel fuel costs? Please explain.

(b) How is YEC able to determine and compare the efficiencies of the natural gas and new diesel gensets? How will YEC be able to determine the difference between the stated efficiencies and the actual operating efficiencies?