

# **Yukon Utilities Board**

Report to Yukon Minister of Justice

Yukon Energy Corporation for Energy Project Certificate

And Energy Operation Certificate Regarding

the Proposed

Whitehorse Diesel to Natural Gas Conversion Project

May 14, 2014



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## 1 INTRODUCTION

On November 22, 2013, pursuant to Section 36 of the *Public Utilities Act*, the Government of Yukon designated the Yukon Energy Corporation's (YEC's) proposed Whitehorse Diesel to Natural Gas Conversion Project (Project) as a Regulated Project under Part 3 of the *Public Utilities Act*.<sup>1</sup> On December 10, 2013, YEC filed an application for an Energy Project Certificate and an Energy Operation Certificate for the Project (Application) with the Yukon Minister of Justice (Minister).

By letter dated December 30, 2013, the Minister referred the Application to the Yukon Utilities Board (Board) for a review and hearing pursuant to Part 3 of the *Public Utilities Act*. The letter included Terms of Reference,<sup>2</sup> which set out the purpose and aspects of the Project to be reviewed, stipulated that the Board hold a public hearing, and submit its report and recommendations to the Minister no later than April 15, 2014. In a letter dated January 14, 2014, the Board requested that the reporting deadline be extended to May 30, 2014 because it had not received the Application until December 31, 2013. The Board explained that the schedule proposed by YEC did not provide sufficient time to complete all of the necessary steps for the public hearing process, while still ensuring a fair and transparent public process.

On January 14, 2014, the Board issued Board Order 2014-01, giving notice of the Application, setting out the process schedule for the Application including a public hearing to be held in Whitehorse, Yukon commencing on March 31, 2014, in accordance with terms set out in the order.

Board Order 2014-01 also requested parties intending to participate in this proceeding register in writing with the Board by January 31, 2014. In their submissions, interested parties were to indicate the nature of their interest and the issues of interest in relation to the Application.

The Board received requests for intervener status from the Yukon Electrical Company Limited (YECL), the Utilities Consumers' Group (UCG), the City of Whitehorse (CW), Don Roberts, and from John Maissan (Leading Edge Projects Inc.) and the Yukon Conservation Society — a joint intervention request (YCS-LE). All requests for intervener status were granted.

All interveners were provided the opportunity to submit information requests, file evidence, cross-examine the YEC witnesses, and provide final argument and reply.

Board Order 2014-01 also indicated that on the evening of March 31, 2014, the Board would hold a community session to allow individuals who were not registered parties to present information and make submissions respecting the Application. Prior to the hearing, community session guidelines were made available to the public. The guidelines indicated that oral statements should be related to the Minister's Terms of Reference on the Project.

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<sup>1</sup> Order-In-Council 2013/200 – Designating Whitehorse Diesel to Natural Gas Conversion Project as Part 3 *Public Utilities Act* regulated project.

<sup>2</sup> See Appendix 2

## 2 OVERVIEW

As described in the Application, the Project will modernize Yukon Energy's Whitehorse thermal generation station (WTGS) in addition to meeting increasing requirements for reliable and flexible thermal generation on the Yukon grid.

The Project includes the replacement of two diesel-generating units scheduled to be retired by 2015, with up to three new modular natural gas-fired generating units supplied by liquefied natural gas (LNG), and the installation of LNG truck offloading, storage, vapourization and related infrastructure. YEC indicated that the LNG will be delivered by truck from Alberta or British Columbia.

YEC submitted that two natural gas-fired generating units were anticipated to be in service Q4 2014 to provide capacity and fuel cost savings during the winter of 2014-15. YEC added that the third unit's projected in-service date would "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."<sup>3</sup>

To accommodate the new facilities required for the Project, YEC indicated that it will acquire approximately 0.9 hectares (ha) of public utility zoned Government of Yukon lands and create access and utility crossings at various locations along the 0.6 ha of privately held railway right-of-way on the expanded site area adjacent to the south of the existing WTGS site. The location of related facilities will be finalized once the Project has been assessed under the *Yukon Environmental and Socio-economic Assessment Act*. YEC submitted a proposal to the *Yukon Environmental and Socio-economic Assessment Board* in August 2013.

YEC submitted that the estimated capital cost (2013\$) for the Project was \$38.8 million, with \$34.4 million allocated to the initial phase, which is expected to be completed by the end of 2014, and the balance of \$4.4 million being spent at the time the third natural gas-fired unit is installed.

### 2.1 Community Session

This section summarizes the statements of the community session participants.

Pointing out YEC's claim that there would be significant savings by using LNG gas for backup instead of diesel, Gordon Gilgan indicated that it might not be uncommon on an annual basis, to require in the order of two to three gigawatt hours (GW.h) of backup generation for the hydro generation on an annual basis. Mr. Gilgan qualified his statement by submitting that he did not have all of the historical background regarding backup diesel generation requirements. Referencing LNG and diesel fuel costs, Mr. Gilgan went on

To state that LNG generators would have to generate 33.14 GW.h of electricity in 2015 to produce a fuel saving of \$2.7 million, which YEC claimed it would save in 2015. For 2017, the LNG backup generators would have to generate 51.55 GW.h. Respecting the sourcing of LNG, Mr. Gilgan stated that the source keeps shifting and may or may not be available. Mr. Gilgan added that installing a smart grid to regulate the consumption of

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<sup>3</sup> Application, page 4.

power and installing wind or solar alternatives provide increased capacity and allow for the transition from fossil fuels. In summary, Mr. Gilgan submitted that YEC's proposal is simply replacing one fossil fuel with another with no guarantee that it would provide a benefit to electricity consumers.<sup>4</sup>

Considering that the cost of LNG had risen elsewhere in Canada, coupled with information provided by stock market analysts, Skeeter Wright indicated that LNG has increased and would continue to increase in price, which in turn would increase electricity rates. Mr. Wright, therefore, suggested that diesel generation was the preferred alternative. Pointing out that LNG production exceeds the effect on greenhouse gases when compared to diesel production, Mr. Wright concluded by stating that Yukoners would be contributing in a greater way to climate change if the Project were approved.<sup>5</sup>

Although she did not dispute the need for diesel generation in order to meet emergency demands and peaking requirements, Sally Wright disagreed with the construction of the Project to cover periods of drought. Ms. Wright submitted that generation requirements during periods of drought should be addressed via renewable energy. Furthermore, it was time for YEC to diversify and to pursue wind energy in combination with load management schemes. Pointing out YEC's response to YCS/LE-YEC-1-59(c), wherein YEC indicated that it was not able to provide an unredacted version of the Wind Assessment Feasibility Study final report, Ms. Wright urged the Board to direct YEC to produce the report, in order that all alternatives may be considered.<sup>6</sup>

Indicating that LNG can't be separated from its full lifecycle, which includes hydraulic fracturing, Rob Lewis submitted that energy projects need to be assessed in relation to climate change. Moreover, comparing the volatility of LNG to diesel fuel, Mr. Lewis stated that LNG has to be used in a shorter period and using it as a backup fuel source is questionable. In addition to being unstable, Mr. Lewis suggested that if LNG were not handled properly, people and property were at risk. With this in mind, Mr. Lewis expressed concerns with the location of the proposed Project. Mr. Lewis concluded by stating that in lieu of the Project, he supported a move to renewable energy, e.g. wind or the building of a transmission line to Skagway.<sup>7</sup>

Aubin Tuzlak, not being supportive of the Project, submitted that there was not proof that LNG gas prices would stay low, which brought into question any money-saving benefits. He added that hydraulic fracturing was destructive to the environment.<sup>8</sup>

Werner Rhein submitted that natural gas in its lifecycle is worse than coal as an environmental pollutant. Mr. Rhein further stated that considering that natural gas is a highly flammable and explosive fuel, the location chosen by YEC for the LNG storage facility was questionable. Considering this, Mr. Rhein indicated that for the sake of

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<sup>4</sup> Community Session transcript, page 6 to 12.

<sup>5</sup> Community Session transcript, page 12 to 16.

<sup>6</sup> Community Session transcript, page 16 to 20.

<sup>7</sup> Community Session transcript, page 20 to 22.

<sup>8</sup> Community Session transcript, page 22 to 23.

emergency backup power, a decentralized facility, made of renewable resources, could be constructed.<sup>9</sup>

Theo Stad questioned the building of a highly compressed gas storage facility near a populated area at the base of a dam. Mr. Stad expressed his concerns stating that the Project has high environmental risks, potential safety risks and comes at a very high cost to taxpayers. Mr. Stad added that, albeit the Board does not necessarily oversee these issues, a renewable energy solution could provide energy without compromising future generations' ability to meet their needs with clean air and water. Mr. Stad concluded by stating that YEC should replace the aging diesel generators with new efficient diesel-powered generators and put investment money into more renewable sources and energy efficiency and conservation programs.<sup>10</sup>

Respecting the prudence of moving forward with the Project, Lois Johnston questioned the predictability of long-term supply and cost. Pointing to the number of LNG exporting plants in the planning or construction phase in North America, Ms. Johnston submitted that the projected increases in domestic and international markets suggests that YEC will be paying much higher prices for LNG in the future. Furthermore, Ms. Johnson questioned the prudence of switching to LNG in light of the need to reduce greenhouse gas emissions and the consequential economic costs of disasters related to climate change. Options for renewable generation alternatives deserve greater attention.<sup>11</sup>

Maryanne Lewis stated that the Yukon needs to move away from fossil fuels and consider renewable resource choices, such as a line to Skagway. Ms. Lewis added that there is need for government to lead the move to renewable energy choices.<sup>12</sup>

Considering the prudence of moving forward with the Project, Jennifer Line spoke to the impacts of climate change, on which any fossil fuel burning has an impact. Ms. Line pointed to climate change concerns related to changes in the Yukon and stated that the changes are real and happening in the Yukon. She added that there are green alternatives. In summary, Ms. Line submitted that climate change effects are real and Yukoners need to show leadership on this issue.<sup>13</sup>

Mary Amerongen stated that the Project does not make economic sense and ties the Yukon further into using fossil fuels, and further, that carbon in the atmosphere is the main contributor to global warming. Pointing out that diesel peaking needs have dropped in the last three years and diesel makes up less than one percent of grid electricity generation, Ms. Amerongen suggested that the Project was not urgent. Ms. Amerongen went on to state that there was time to use an alternative electricity source — a source that would not lock the Yukon into the new unstable fossil fuel, as this major new project would. Pointing out that the price of LNG would rise when exported from BC, Ms. Amerongen submitted that economics don't support the Project.

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<sup>9</sup> Community Session transcript, page 23 to 30.

<sup>10</sup> Community Session transcript, page 30 to 35.

<sup>11</sup> Community Session transcript, page 35 to 41.

<sup>12</sup> Community Session transcript, page 41 to 47.

<sup>13</sup> Community Session transcript, page 47 to 53.

Moreover, funds invested in renewable electrical energy stay in the community and do not cause pollution.<sup>14</sup>

Cam Kos expressed concerns with the Project's location at the base of the dam and there being no backup source of LNG supply. Mr. Kos stated that there was a myriad of possibilities respecting the breaking of the critical supply chain or getting the required fuel up to Whitehorse. Mr. Koss suggested that the replacement of the diesel units needed to be thought through very carefully. Mr. Koss indicated concerns that the economics of the Project did not account for LNG special skills or training necessary for YEC's personnel, the BC government's recent announced tax increase on exported natural gas and LNG prices based on a fixed price with two-percent inflation. Mr. Koss was concerned that seniors would be affected by increased rates should the Project proceed.<sup>15</sup>

Ken de la Barre recommended that the Board consider delaying the Project and take the time to seriously look at other alternatives including an improved diesel installation, wind and energy storage systems to name a few.<sup>16</sup>

Jacqueline Vigneaux voiced a concern regarding funds that have been committed prior to the granting of an approval for the Project as well as concerns related to LNG pricing and security of supply. She stated that this volatile source of energy can run out at any time. Ms. Vigneaux opposed the Project based on the premise that the new source of gas would be fracked.<sup>17</sup>

Gary Bemis suggested that additional costs to obtain LNG are not being considered. The carbon footprint of fracked gas and associated pollution should be considered by the Board. Mr. Bemis also submitted that there are health care costs related to fracked gas.<sup>18</sup>

Colleen James indicated that this is not a prudent project and should not proceed. Ms. James recommended that the Board, YEC and the Yukon government take their time and apply due diligence and do their homework in respect of the Project. Ms. James submitted that for the sake of our grandchildren and for future generations, YEC should not spend that kind of money on the Project.<sup>19</sup>

Bob Jickling suggested that the Project was badly conceived. With regard to prudence, Mr. Jickling added that the decision to proceed with the Project is not a technical decision; it is a moral decision. Moreover, the Yukon is small enough to do things differently and take alternatives seriously. Mr. Jickling concluded by stating that the Project should be declined; furthermore, there is no community licence to go forward with the Project.<sup>20</sup>

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<sup>14</sup> Community Session transcript, page 53 to 56.

<sup>15</sup> Community Session transcript, page 57 to 62.

<sup>16</sup> Community Session transcript, page 63 to 66.

<sup>17</sup> Community Session transcript, page 66 to 68.

<sup>18</sup> Community Session transcript, page 69 to 71.

<sup>19</sup> Community Session transcript, page 71 to 74.

<sup>20</sup> Community Session transcript, page 74 to 79.

## **2.2 Letters of comment**

The Board also received letters of comment from interested individuals.

## **2.3 Board statement on community input**

The Board appreciates the effort taken by many individuals to present information that may not have been considered by registered interveners and the Applicant. The Board took into consideration in its deliberations the views and statements of individuals who made presentations at the community session and who submitted letters of comment.

# **3 NECESSITY FOR THE LNG PROJECT**

## **3.1 Public Need for the LNG Project**

The Minister asked the Board to consider the public need for the Project under various reasonable electric load forecasts, including near-term requirements related to industrial and non-industrial loads and the effect of the Project on the rates of customers. In this section, the Board considers the public need for the Project under various electric load forecasts.

### **3.1.1 Views of YEC**

YEC pointed out that in Appendix A, the Reasons for Decision to Board Order 2013-01,<sup>21</sup> the Board considered that LNG-powered thermal generation appeared to be a viable project. YEC added that in the same decision, the Board directed YEC in its compliance filing to base its hydro and diesel energy requirements on 100-percent long-term average (LTA) hydro generation for the forecast load.

YEC submitted that the Project would provide reliable and flexible new generation capacity that is required today in Whitehorse to meet Yukon Energy's reserve capacity planning criteria for the Yukon grid, including reserve capacity for seasonal low water periods and drought years, while at the same time, supplying short-term non-industrial load growth and peak winter demand.

Furthermore, although the isolated Yukon grid<sup>22</sup> is predominantly served today by hydro-electric generation, YEC stated that reliable and flexible thermal generation continues to be a critical component. To that end, YEC submitted that it owns and operates 37 megawatts (MW) of diesel generation to provide reserve capacity for the Yukon grid in order to meet emergency backup requirements, as well as grid loads during winter months and other periods when water availability for hydro generation is limited by seasonal or drought conditions or is otherwise insufficient to meet grid load requirements

YEC submitted that completion of the Carmacks-Stewart Transmission Project (CSTP) that connected the Whitehorse-Aishihik-Faro (WAF) and Mayo-Dawson (MD) grids, and completion of the Mayo B Hydro Enhancement and the Aishihik Third Turbine projects expanded Yukon Energy's hydro generation capability on the new integrated grid with

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<sup>21</sup> Board Order 2013-01 Appendix A – Reasons for Decision, paragraph 384.

<sup>22</sup> "Yukon's isolated grid has no access to external...power grids"; Application, page 17.

forecast reductions in LTA diesel generation from these new projects estimated to be in excess of 20 GW.h per year in 2012 and 2013.

Notwithstanding these increased generation capabilities, YEC asserted that load growth on the Yukon grid has depleted the surplus hydro availability. Consequently, thermal generation is becoming the default option to meet current energy and capacity requirements, until “long-term loads are sufficient to support economic new renewable generation.”<sup>23</sup>

As a result, YEC submitted that it was pursuing new renewable energy developments to displace growth in diesel generation requirements. Moreover, YEC submitted that it was working with YECL in order to implement a demand-side management (DSM) program to reduce the load-growth impacts on generation requirements.

Respecting the need for the Project, YEC submitted that the Project is driven by a forecast grid capacity shortfall of 7 MW by the start of 2015, 10.9 MW by the start of 2017 and 17 MW by the start of 2019. YEC added that these forecast grid capacity shortfalls reflect forecast non-industrial peak winter load, reserve capacity needed to meet the N-1 risk (loss of Aishihik line) and the firm winter capacity of existing and currently committed generation and transmission. YEC pointed out that Whitehorse diesel engines, WD1 and WD2, being at the end of their useful lives in the 2014-15 timeframe, in effect removes eight MW of derated capacity at the Whitehorse diesel plant and drives the need for seven MW of new capacity by the start of 2015.

YEC submitted that the Project’s 8.8 MW of new gas-fired generation capacity, forecast to be in service by the start of 2015, will meet this shortfall requirement. Furthermore, the third gas-fired unit (4.375 MW), currently expected to be in service by the start of 2017, will meet the forecast capacity shortfall at that time.

Pointing to an additional benefit accruing to the Project, YEC submitted that the capacity shortfall need results in an opportunity to modernize the existing Whitehorse diesel plant with gas-fired units that are cleaner burning and cheaper to run than diesel units.

In its argument, YEC reiterated that the primary need for the Project was capacity, which is needed to meet YEC’s capacity requirements that are based on a conservative load forecast. Respecting the load forecast, YEC stated that the forecast does not include the Alexco mine load, which will be back on the grid in 2015, and is based on future LTA hydro. Moreover, YEC added that the remaining five diesel units at the WTGS were all planned to be retired within the next 13 years. As a result, ongoing modernization of this key facility is needed over this period.<sup>24</sup>

YEC pointed out that the Project will allow YEC to install new capacity required to meet the shortfall grid-load capacity without raising rates. Moreover, YEC submitted that Project costs for capital and fuel charges under the base case forecast would be less than would occur with no new capacity.

...if there was nothing done, no capital costs for either new diesels or refurbishments and it was compared to the LNG alternative, there would be

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<sup>23</sup> Application, Section 4.1.2, page 18

<sup>24</sup> Transcript, April 2, 2014, page 444 and 445.

savings and rates to customers of \$700,000 in 2016 and increasing to 2.1 million by 2018.

...

...if you didn't do anything to the diesels, just from a pure economic point of view, the LNG project drives very significant savings for ratepayers.<sup>25</sup>

Responding to YCS/LE comments about renewable energy projects providing capacity, YEC submitted that Aishihik No. 3's capacity was not the purpose of this review; "this review is about the terms of reference."<sup>26</sup> YEC added that the prudence of costs is a matter for a future general rate application if the Project goes ahead. Further referencing YCS/LE comments, YEC reiterated that "hydro – based systems require thermal backup."<sup>27</sup>

YEC resubmitted that when assessing the prudence of the Project, ratepayer savings and costs of the Project were determined by using LTA diesel and hydro generation requirements. Respecting the intervenor comments regarding the spread between LNG and diesel forecasts of the U.S. Energy Information Administration (EIA) and the National Energy Board (NEB), YEC submitted that the forecasts were determined by leading U.S. and Canadian energy agencies. Moreover, YEC submitted that it "could not find one credible forecast ... that was, in substance, different than what the NEB and EIA said."<sup>28</sup> Furthermore, YEC stated that the forecast spread has been on the record for some time and remains unchallenged.

### 3.1.2 Views of Interveners

UCG pointed out that currently in Whitehorse, backup capacity for the grid was being provided by 46-year old Mirrlees (WD1 and WD2) diesel engines. UCG acknowledged that there was a need for capacity to replace these engines with some alternative in the near future.

UCG argued that, aside from Mr. Morrison's discussions with his engineer regarding WD1 and WD2, there was no written report respecting the different aspects of the wear and tear on the engines and the alternatives for their future replacement. Notwithstanding, UCG accepted that, in the short-term, the Mirrlees would have to be replaced.<sup>29</sup>

UCG noted that YEC had indicated that they required the ability to replace the capacity provided by WD1 and WD2 and there was also a need for capacity to address increasing load, in effect "expanding the need for capacity along with the replacement of the existing engines."<sup>30</sup> UCG expressed concerns that there was very little evidence that YEC was looking to reduce any amount of load that may be contributing to an increased need for capacity.

... in relation to the public need, we would be more encouraged if this application was accompanied by more significant commitment to reduce load. Particularly

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<sup>25</sup> Transcript, April 2, 2014, page 445, line 22 to page 446, line 1 and page 446, lines 7 to 10

<sup>26</sup> Transcript, April 2, 2014, page 542, lines 4 to 5.

<sup>27</sup> Transcript, April 2, 2014, page 543, line 4.

<sup>28</sup> Transcript, April 2, 2014, page 547, lines 3 to 5.

<sup>29</sup> Transcript, April 2, 2014, page 479, lines 17 to 24.

<sup>30</sup> Transcript, April 2, 2014, page 480, lines 5 to 6.

more significant commitment for new renewable generation and enhancement of DSM.

...

... the company has downplayed the ability to request some industrials to rely on their own diesel in the case of an emergency ... this kind of capacity...is an additional factor that [may be used] in relation to how much capacity is needed and when it is needed.<sup>31</sup>

Respecting the projected rate savings of the Project to customers based on the anticipated differential between the price of natural gas and diesel, UCG pointed out that the predicted savings for ratepayers may not occur because of price volatility.

YCS/LE noted that the Project concerned capacity and energy and pointed out that renewable energy projects could provide capacity:

... a good example of that is the Aishihik project of YEC's. It provides energy, but it also provides capacity. And it provides dependable capacity, firm capacity, ... it's available, and it's only subject to a transmission outage.<sup>32</sup>

Suggesting that YEC had known about the grid's capacity problem since 2006, YCS/LE submitted that the WD1 and WD2 need to be replaced and there has been plenty of time to look at alternatives. Furthermore, as a result of poor planning and not moving toward a solution considerably sooner, YEC has put the Board in a very awkward position in that YEC has already committed approximately \$16.7 million to the Project without Board approval. YCS/LE concluded by indicating that BC Hydro had been directed by the government of British Columbia to run its predominantly hydro-based electric system without any major thermal generation.<sup>33</sup> YCS/LE argued that the accuracy of the forecasts adopted by YEC in respect of oil and natural gas prices have a great influence on Project economics.

... [The project] at its core it's relying on a price gap forecast the representatives of YEC did not prepare and are not qualified to interpret, and is based on a 4-year business case where the assets have a 40-year life.<sup>34</sup>

Mr. Roberts expressed concerns that YEC did not have a solid plan to convert diesel to LNG and had spent a large amount of money on the Project without approvals. Submitting that there was a need for reliable backup capacity for emergency situations, Mr. Roberts suggested that options had been discounted by YEC without engaging Yukon ratepayers. Considering that WD1 and WD2 were to be decommissioned a decade ago, Mr. Roberts questioned the urgency for immediate replacement of the Mirrlees engines. Mr. Roberts submitted that the Project should be deferred until there is a better understanding of where natural gas and LNG prices are going and reasonable alternatives to the Project have been fairly and adequately considered. Mr. Roberts concluded that this Project should not move forward until all the evidence is before the Board.<sup>35</sup>

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<sup>31</sup> Transcript, April 2, 2014, page 480, line 23 to page 481, line 2 and page 481, lines 8 to 14.

<sup>32</sup> Transcript, April 2, 2014, page 492, lines 6 to 11.

<sup>33</sup> Transcript, April 2, 2014, page 494.

<sup>34</sup> Transcript, April 2, 2014, page 521, lines 4 to 7.

<sup>35</sup> Transcript, April 2, 2014, pages 523 to 536.

CW did not object to the Project, subject to various concerns being addressed. These concerns and the conditions requested by CW are discussed in Section 3.5.6. However, CW maintained its position that YEC's focus should be on development of new alternative, renewable energy generation that does not result in carbon emissions or the same amount of carbon emissions as thermal generation alternatives. It added that it expects that additional LNG facilities will not be developed to the detriment or exclusion of more environmentally sound alternatives. CW did not want LNG to be used as anything but backup or emergency generation and may not support additional LNG projects in the future.

### 3.1.3 Views of the Board

The Board notes and accepts YEC's submission that the

Project is to provide sufficient new gas-fired generation capacity between the end of 2014 and 2018 at Base Case forecast loads (a) to meet expected grid capacity planning requirements during these years with retirement of the two Mirrlees units, and (b) to displace during each of these years more than 95% of the expected grid diesel generation requirements (assuming long-term average hydro generation) and reduce overall diesel generation during drought years. [footnote omitted]<sup>36</sup>

### 3.2 Retirement of the Mirrlees WD1 and WD2 units

YEC identified the need to replace or significantly refurbish its aging diesel generating units as part of its 2006, 20-Year Resource Plan filing. The Board took note of the November 2013 update to YEC's 20-Year Resource Plan which indicates that 7.0 MW of additional grid capacity is required by 2015, as the two Mirrlees units, WD1 and WD2, at the WTGS are to be retired in 2014 and 2015.<sup>37</sup> The interveners did not take issue with respect to the required replacement of WD1 and WD2 in the short term; however, interveners did question the urgency of replacing the units and suggested examining other alternatives.

The Board is convinced by YEC's submission that retention of the WD1 and WD2 Mirrlees units beyond retirement would expose all grid customers to unreliable generation capacity in addition to higher fuel costs. Moreover, replacement or life extension of these units would be required as soon as possible, by late 2015 at the latest. Respecting the life extension option, the Board agrees with YEC that refurbishment could be a very expensive and unreliable option.

What I can state is that in fact the cost estimates that the company has generated for the refurbishment of the Mirrlees has risen from a half a million dollars a megawatt to three-quarters of a million dollars a megawatt based on the experience gained in our first two rebuilds on WD3 and FD1. And that is now approximately half the cost of a new replacement diesel.

...

When we undertook FD1 and WD3 ...

... getting parts in the end [was a problem]. These refurbishments took not just months longer, they took a year plus longer than they should have, that being a big part of the reason. In the end we had to try to get somebody to fabricate

<sup>36</sup> Application, page 8, Section 3.1.2.

<sup>37</sup> Application, page 9.

parts, which is not a good idea. We got parts that were completely ill-fitting, they didn't fit. They were the wrong dimensions. All of the capacity for building parts for these engines on a new basis has been outsourced ... There is no guarantee on quality...

...  
These engines are difficult at the best of times to operate. With parts that aren't working and breaking down, I don't see the reliability there.<sup>38</sup>

Considering the above, the Board finds that there is a need to replace the Mirrlees units — i.e. WD1 and WD2 — in the short term, and accepts YEC's submission that the primary need for the Project is one of capacity.

### 3.3 Forecast Load

With respect to forecast load, the Board observes that the grid-connected load has increased since 2006, thus exacerbating the need to replace the WD1 and WD2 units. Further, the Yukon grid load growth under base case load conditions is projected to require average default diesel fuel energy generation. Based on LTA hydro and wind generation, YEC forecast default diesel fuel energy generation to increase from 11 GW.h in 2013 to 17 GW.h in 2015, 41 GW.h in 2020 and 92 GW.h in 2030. The base case load forecast, and other grid load forecasts show expected default diesel generation requirements after load reductions from DSM programs, but prior to development of a new non-diesel generation supply capacity on the grid.

The Board accepts YEC's base case non-industrial load forecast<sup>39</sup> which indicates a 2.1-percent average annual growth rate for the period from 2013 to 2030 because this compares favorably with a 2.0-percent non-industrial load growth rate for the period from 1994 to 2013.<sup>40</sup> The 2.0-percent growth rate includes a period of time — 1997 to 2000 — wherein grid load experienced a decline in sales as a result of the Faro mine closure.

In addition, YEC's base case near-term grid load forecast assumes no connection of major mine loads including the Alexco mine load. As a result, the Board is of the view that YEC's load forecast is conservative and reasonable to use. YEC's load forecast for the period is used to evaluate the economics of the Project. Based on the above, the Board concludes that need for reliable thermal generation has been shown.

### 3.4 Capability of Existing Generation and Transmission Facilities

Section 3(b) of the Terms of Reference requested the Board to consider the capability of existing and currently committed generation and transmission facilities, including thermal generation facilities, to provide reliable electric power generation to meet the forecast load requirements taking into account YEC's capacity planning criteria. In this section, the Board will consider the need for the Project taking into account YEC's capacity planning criteria and forecast of diesel energy requirements.

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<sup>38</sup> Transcript, March 31, 2014; page 59, line 22 to page 60, line 3; page 61, lines 2 to 16; page 62, lines 8 to 10

<sup>39</sup> Application, Table C-1.

<sup>40</sup> YCS/LE-YEC-1-52, page 3 of 5, Table 1.

### 3.4.1 Views of YEC

YEC submitted that load growth on the grid combined with diesel unit retirements was now forecast to require material new installed generation capacity over the next 20 years. YEC pointed out that a key factor is that “all Yukon Energy diesel units, totaling 37 MW of capacity, are currently planned for retirement by 2031.”<sup>41</sup> Moreover, because of the age of its units, these diesel retirements may need to be advanced as usage of the engines increases or parts and maintenance costs increase, or parts become unavailable.

YEC further submitted that the WTGS, which was commissioned in 1968, has seven diesel engines with an installed nameplate capacity of 25 MW that are to be retired within the next 13 years. The retirement of the WD1 and WD2 Mirrlees units at the Whitehorse plant slated for 2014 and 2015 and ongoing non-industrial load growth results in a requirement for at least 7.0 MW of new generation capacity by late 2014, 8.5 MW by late 2015, 10.9 MW by late 2016, and 13.0 MW by late 2017 to maintain grid system capacity needed for forecast non-industrial peak winter.<sup>42</sup>

YEC also submitted that despite increased hydro generation capabilities, ongoing load growth on the grid has increased the need to be able to use thermal-based generation units (diesel or LNG) to meet peak demand and provide energy, further adding to the need for new thermal generation capacity to replace retiring units.<sup>43</sup>

As discussed above, YEC presented its technical case for the Project in terms of the need to replace the two existing Mirrlees diesel generating units (WD1 and WD2) at the existing WTGS, which are at the end of their useful operating life.

YEC proposed to install up to three new LNG-fired General Electric Jenbacher, J624 generating units. The main purposes of the units are to provide more reliable, efficient and flexible capacity (MW) and to provide thermal based energy (GWh) at a lower cost than currently existing diesel units, when needed.

The two existing units, WD1 and WD2, are rated at 9.1 MW total (currently de-rated to 8.0 MW) while each of the General Electric (GE) units is rated at approximately 4.4 MW (4.375MW). YEC proposed to install the first two GE units by the end of 2014 to meet the 2015 peak. A third GE unit proposed as part of the Project is to be installed later as required to meet grid capacity planning requirements.<sup>44</sup> YEC stated that this third unit may be needed as soon as the end of 2016 to meet the 2017 peak. These three GE units would provide a total of 13.1 MW in replacement capacity and additional capacity to meet system need.

As an alternative, for comparative purposes, YEC proposed a New Diesel alternative which assumed the installation of two new 6.7 MW diesel generators (13.4 MW total) with higher fuel efficiency (40 percent) in the WD1 and WD2 service bays, with the first unit installed in late 2014 and the second unit in late 2015. The New Diesel option would provide the ability to meet grid capacity shortfall requirements through to 2018 for

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<sup>41</sup> Application, page 21.

<sup>42</sup> See Table 2 in this Section of the Report.

<sup>43</sup> Transcript, March 31, 2014, page 16-17; also page 152 to154.

<sup>44</sup> YUB-YEC 1-8(a), YUB-YEC 1-25, YUB-YEC 1-12(c) and YUB-YEC 1-28.

reliable grid electricity supply under base case forecasts. This option would also provide the ability to use more efficient diesel generation units to meet a substantive share of ongoing forecast grid default diesel generation requirements, assuming LTA hydro generation.

In support of the increased need for generating capacity, YEC cited its capacity planning criteria, which in the absence of major new mine loads is that the grid be planned to be able to carry the forecast peak winter loads, excluding major industrial loads, under the largest single contingency known as N-1. YEC stated that this contingency was the loss of the system's single largest generation or transmission-related generation source which currently was the transmission line connecting the Aishihik generating capacity (37 MW) to the rest of the system.<sup>45</sup>

In its evidence, YEC provided the following two tables that illustrate the need for new capacity projected to 2020 on an annual basis and to 2030 on a five-year basis utilizing YEC's base case load forecast with no provision for the Alexco mine.

**Table 1. Forecast Base Case (No Alexco) New Grid Capacity Requirements (2015-2030) in Megawatts (MW)**

Year	2015	2020	2025	2030
Forecast Non-Industrial Peak	76.5	83.9	93.3	105.5
Reliable Capacity Required	113.5	120.9	130.3	142.5
Existing Peak Winter Capacity	106.5	100.2	84.7	78.9
New Capacity Requirement	7.0	20.7	45.6	63.6

Source: Application, Table 4-2

**Table 2. Forecast Base Case (No Alexco) New Grid Capacity Requirements (2015-2020) In Megawatts (MW)**

Year	2015	2016	2017	2018	2019	2020
Forecast Non-Industrial Peak	76.5	78.0	79.4	80.9	82.3	83.9
Reliable Capacity Required	113.5	115.0	116.4	117.9	119.3	120.9
Existing Peak Winter Capacity	106.5	106.5	105.6	104.8	102.3	100.2
New Capacity Requirement	7.0	8.5	10.9	13.0	17.0	20.7

Source: Information request YUB-YEC-1-30

YEC asserted that the retirement of Whitehorse diesel generation units WD1 and WD2 (8.0 MW), scheduled for 2014 and 2015 and ongoing non-industrial load growth results in a requirement for at least 7.0 MW of new generation capacity by late 2014, 8.5 MW by late 2015, 10.9 MW by late 2016, and 13.0 MW by late 2017 to maintain grid system capacity needed for forecast non-industrial peak winter at the beginning of the following year.

YEC added that its proposed Project with a total capacity of 13.1 MW would meet that capacity need through to 2018. As well, YEC stated that its New Diesel alternative option with a total capacity of 13.4 MW also met that capacity need through to 2018.

<sup>45</sup> Transcript, March 31, 2014, page 156 to 158.

YEC also stated that, subject to any new capacity provided by new renewable generation, its forecasts confirmed the amount of new thermal generation capacity needed on the grid for each year after 2017 to meet capacity planning requirements.

In terms of meeting system energy requirements, YEC cited the direction by the Board to forecast hydro and diesel generation requirements for the years 2012 and 2013 assuming 100-percent LTA hydro generation, rather than forecast actual diesel generation for these years based on current water supplies.

YEC stated that in forecasting default diesel energy requirements beyond 2013 to 2030, it utilized LTA hydro generation in the YEC SIM<sup>46</sup> modelling of the various load scenarios it evaluated for forecast purposes. In addition, YEC assumed no major new mines in its base case forecast and did not assume any new sources of renewable generation supply in predicting the amount of default diesel generation that might be required going forward. Potential displacement of diesel by natural gas was not considered in that forecast.

**Table 3. Long-Term Average Diesel Generation for the Base Case (No Alexco) (2015 to 2018) in GW.h**

<b>Forecast years</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Total energy generation required (includes Industrial Load)	426.3	437.3	444.3	451.5
Predicted existing Diesel generation requirements	17.0 (4.0%)	22.9 (5.2%)	26.9 (6.1%)	31.4 (7.0%)
Predicted LNG displacement of existing Diesel generation requirements	17.0 (100%)	21.8 (95%)	26.9 (100%)	31.4 (100%)
Predicted New Diesel displacement of existing Diesel generation requirements	15.3 (90%)	22.9 (100%)	26.9 (100%)	31.4 (100%)

Sources, Appendix C: Table C-2 and Table 4-3 of the Application, also Appendix D of the Application

<sup>46</sup> Application, page 30, footnote 46 - YEC SIM is the generation simulation model for the integrated grid (WAF and MD grids) developed for YEC by KGS Group.

YEC submitted that the forecast diesel requirement was based on the updated load forecast for 2013 to 2030 in Appendix C and that actual diesel requirements in any year will be affected by actual water and weather conditions.

YEC stated that it had adopted the energy production analysis in Appendix D for purposes of determining how much energy it might be required to produce annually from diesel generating units based on LTA hydro conditions. YEC utilized these resulting expected energy generation numbers, based on long-term averages, in its economic analysis for the Application.

YEC explained that the Appendix D analysis used YEC'SIM analyses of 31 water years to develop estimates of the potential annual displacement of default diesel requirements, based on LTA hydro generation and forecast assumptions in Appendix C, with different levels of new gas or new diesel capacity.<sup>47</sup>

This analysis took into account the extent to which high utilization operation of such new units could be expected to augment hydro storage on the grid and indicated the extent to which such augmented storage and operation on the new thermal units would be able to displace "old" default diesel generation during such extreme drought years, including a sequence of such years.

### **3.4.2 Views of the Interveners**

The interveners questioned and addressed the need for and timing of replacement generating capacity mostly in the context of the condition of the existing Mirrlees units. Their views were mainly applicable to the following Section 4, Alternatives to the LNG Project, which addresses alternatives to the LNG Project, including the Status Quo alternative. Those views are not repeated in this section to avoid duplication and for purposes of brevity, but the Board was mindful of their views in its evaluation of the need for new capacity.

### **3.4.3 Views of the Board**

The Board reviewed YEC's evidence as portrayed in Tables 1, 2, and 3 respecting the capability of the existing generation and transmission facilities to meet the forecast load requirements. This included an examination of the background as to how YEC's evidence was arrived at, consideration of YEC's capacity planning criteria and the effect of the Project on the system's capability. Additionally, the Board considered the effect of the New Diesel alternative option on the system's capability.

Respecting YEC's capacity planning criteria, the Board has considered and dealt with these criteria in its previous proceedings.<sup>48</sup> The Board notes that YEC stated that its N-1 capacity planning criteria focuses only on non-industrial peak load during winter (i.e. industrial peak load is excluded), and hydro generation firm capacity during winter.<sup>49</sup>

In the case of YEC's current system this N-1 event is the loss of the Aishihik transmission line that links the Aishihik hydro plant (37 MW) with the rest of the system. The loss of that transmission line also means the loss of both the Haines Junction load

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<sup>47</sup> Transcript, March 31, 2014, page 143 to 148.

<sup>48</sup> Starting in 2006 with YEC's 20-Year Resource Plan.

<sup>49</sup> Application, Appendix C, page C-7, Footnote 10.

and generation (1 MW and 1.75 MW respectively) from the system. The Board accepts YEC's statements on these aspects of the need from a technical perspective.

The Board also notes YEC's statement that an updated assessment determined its Loss of Load Expectation (LOLE) criteria affected capacity planning requirements when industrial loads exceed 13 MW, and that under its Base Case scenario (both with and without Alexco) total industrial peak load is forecast to be below 13 MW (Minto at 5.3 MW and Alexco 2.7 MW).<sup>50</sup> The Board accepts YEC's statement on that aspect of the need from a technical standpoint. The Board finds that in this case the need for replacement and new generating capacity is subject to the N-1 capacity planning criteria.

Based on this criteria, the Board has reviewed the evidence as presented in Table 2 and finds as follows:

- if both Mirrlees units (WD1 and WD2), derated to 8 MW capacity, are retired at the end of 2014 as proposed, YEC's evidence shows a need for 7.0 MW of replacement capacity at the beginning of 2015,<sup>51</sup> and further additional capacity in subsequent years.
- given the current Base Case Load Forecast (no Alexco), the 8.8 MW of replacement capacity provided by the first two units of the Project as proposed by YEC would be adequate to meet the N-1 planning criteria until the start of 2017 and perhaps slightly longer depending how much additional load actually materializes by that time. Subsequently, a third proposed 4.4-MW unit might then be required to meet the need for additional capacity through to 2018.<sup>52</sup>
- given the current Base Case Load Forecast (no Alexco), the 13.4 MW of New Diesel capacity would also be adequate to meet the N-1 planning criteria through to 2018 or possibly 2019, again depending on how much additional load actually materializes by that time.

Moving to YEC's forecast of its diesel energy supply requirements, the Board reviewed YEC's evidence respecting YEC's determination of those energy requirements as illustrated in Table 3. The Board notes that YEC assumed 100-percent LTA hydro generation in its YECSIM modelling of the various load scenarios in arriving at its forecast of diesel requirements. The Board believes it is also important to note that YEC does not intend to actually operate its diesel units to suit such a forecast, but instead relies on actual water and weather conditions in determining a shorter-term forecast that guides its real time operations on a year to year basis.<sup>53</sup>

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<sup>50</sup> Application, Appendix C, page C-7, Footnote 12.

<sup>51</sup> YUB-YEC-1-30(a).

<sup>52</sup> YUB-YEC 1-28, YUB-YEC 1-25.

<sup>53</sup> Transcript, April 1, 2014, page 379 to 389

The Board notes YEC's statements that rates reflect long-term averages as does most of the planning and forecasting history.<sup>54</sup> YEC's statements that the long-term averages are also applicable to the savings that the ratepayer gets regardless of the actual amount of water and diesel generation, and therefore, the default diesel requirements as shown in Table 3, based on LTA hydro generation, are the relevant numbers for evaluation of the Project and the New Diesel alternative. The Board agrees with that view.

The Board notes that YEC used its YECSIM model to determine the amount of its forecast diesel requirements that could be provided by either the Project or the New Diesel alternative. Having reviewed YEC's evidence<sup>55</sup> respecting the amount of "old or existing" diesel energy displacement that could be provided by the Project or the New Diesel alternative, the Board accepts YEC's estimates of that displacement or replacement for comparative purposes. Those estimates are shown in Table 3.

The Board notes that the interveners questioned the need for new capacity on the system in part based on the ability of the existing two Mirrlees diesel-generating units to continue operating in the near term and appeared to accept that in the longer term at least, those units would need to be retired and new capacity provided to meet that need.

### **3.5 Risks Facing the LNG Project**

Under the Terms of Reference, the Board was asked to report on and make recommendations about the necessity for the Whitehorse Diesel to Natural Gas Conversion Project with particular regard to the risks facing the Whitehorse Diesel to Natural Gas Conversion Project and their potential impacts on rates for customers.<sup>56</sup> In this section, the Board investigates the risks facing the Project and their potential impact on customer rates. Under section 4.3<sup>57</sup> of its Application, YEC identified the risks and potential impacts on ratepayer savings:

- Capital cost risks
- Fuel cost risks
- Grid load risks
- Risks related to regulatory schedule delays

The risks identified above were further broken down and are explained below.

#### **3.5.1 Capital Cost Risks**

YEC explained that the risk for capital costs could take the form of the capital costs for the Project being greater than the current forecast of \$36.48 million<sup>58</sup>. There is a risk that the actual depreciation of the capital assets could be less than is currently forecast (40-year life) and that the actual cost of capital (costs for debt and equity) could be higher than what is currently been approved for YEC.

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<sup>54</sup> Transcript, April 1, 2014, page 383 to 384.

<sup>55</sup> Application, page 30 to 31 and Appendix D; Transcript, April 1, 2014, page 377 to 378.

<sup>56</sup> Exhibit A-2, page 2, part 3 c.

<sup>57</sup> Application, page 33.

<sup>58</sup> YUB-YEC-1-1(d), Table 1.

In argument,<sup>59</sup> YEC stated that most of the major costs have been tendered. During cross-examination, YEC informed the Board that the only items outstanding pertained to site costs and the related civil engineering, and the YESAB recommendation that an underground distribution line be installed.

### 3.5.1.1 Views of the Board

The Board notes the following YEC testimony:

Q. And the question is -- now, you provided, as you've just stated, an update on how the costs have evolved in the contingency. Now, the preliminary capital project costs contained in the application have been updated from 34.36 million to 36.48 million. And I was wondering if you considered that these costs are still preliminary or what -- basically, what margin of error is there still in this, or what -- how might these increase with further engineering work?

A. MR. MORRISON: Sure. We're much more comfortable with the \$36 million estimate because we now have, you know, firm pricing on a number of the major items that relate to the budget. So we've -- and we have had for a while, quite a while, you know, a cost for the engines themselves, which they are a big part of the costs. So we've got that nailed down.

We now have costs on a contractual basis for the tanks and the vapourization and the truck offloading, onloading -- again, a large part.

The major item that has not been tendered -- and that tender is out now -- is the civil works. So the, you know, civil works, from our experience, you know, can be quite costly. So we've -- that's really the major item that's still outstanding that wouldn't give us some very firm pricing.

And so with that, we have a million two contingent -- so \$1.45 million contingencies in this \$36 million after we have contracts out for engineering, project management, engines, storage tanks, vapourization, and offloading equipment.

So really, the exposure is the civil -- the civil works. We'll have those prices pretty quickly. We have been getting responses to our tenders already. So we're really pretty comfortable.

It was -- it was a lot of work after the tank and vapourization numbers came in higher, to make sure that we could configure the project in the right way and get the best value. So we recognize that the costs have gone up, but we're quite pleased that they haven't gone up -- you know, they've been under the 10 percent cost increase overall for the budget, and that we are -- we now have, as well, very firm pricing most of the major items.<sup>60</sup>

The Board is of the view that from a capital cost perspective, ratepayers are faced with risks related to the civil costs for site preparation of the Project and the current YESAB requirement that power lines on the site be located underground.

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<sup>59</sup> YEC Argument, Transcript, April 2, 2014, page 462 to 463.

<sup>60</sup> Transcript, April 1, 2014 page 401, line 14 to page 403, line 5.

Site costs, from Table 1 of YUB-YEC-1-1(d) represent 19 percent<sup>61</sup> of the latest total estimated costs for the Project. Within the construction contract costs, YEC has placed \$1.0 million for contingencies.

With respect to the YESAB condition regarding the on-site power lines, a position supported by the City of Whitehorse<sup>62</sup>, YEC has stated that it could be \$1 million<sup>63</sup> to place the power lines underground instead of overhead and plans to have further discussions with YESAB regarding that matter.<sup>64</sup> From a cost perspective and in light of the evidence of YEC that there will be other overhead lines at the Project site, the Board is not convinced that there is a need to investigate an underground option for the siting of the distribution lines associated with the Project and rejects CW's request for such a condition.<sup>65</sup>

The Board is satisfied with the latest cost estimate provided by YEC and that sufficient contingencies are in place to cover any unplanned variances.

Further, the Board is satisfied, from a capital cost perspective, that the Whitehorse Diesel to Natural Gas Conversion Project, as currently proposed by YEC, is reasonable.

### 3.5.2 Fuel Cost Risks

In determining the fuel cost savings to customers, YEC stated that lower-than-forecast diesel fuel prices would reduce fuel cost savings, as could higher-than-forecast AECO natural gas prices. Further, fuel cost savings could be eroded if the transportation costs for the LNG are greater than the forecast costs of 4.4 cents/kw.h. The transportation costs could be higher if the A-trains are not licenced for use in Alberta and British Columbia or if the supply of the LNG comes from a location other than the forecast location of Calgary.

YEC informed the Board on March 27, 2014 that Shell Canada decided not to proceed with the Jumping Pound LNG Plant near Calgary<sup>66</sup> and that YEC was now securing LNG supply from the FortisBC plant at Tilbury (Delta, BC). YEC further stated<sup>67</sup>:

Overall, using Rate Schedule 46 contract energy from FortisBC, YEC's updated estimate for LNG delivery to Whitehorse from Tilbury with A-Trains is basically the same cost as (or slightly lower than) the costs estimated for supply from a Shell Jumping Pound plant using A-Train units.

Using NT Energy's Tridem unit costs to secure and deliver LNG to Whitehorse would be about \$1.78/MMBtu (1.5 c/kW.h at 40 percent conversion efficiency) more expensive than the estimated cost for supply from Shell with A-Trains.

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<sup>61</sup> 19% = \$6.78 million/\$36.48 million.

<sup>62</sup> CW Argument, paragraph 16.

<sup>63</sup> Transcript, April 1, 2014, page 405, line 4.

<sup>64</sup> Transcript, March 31, 2014, page 25, lines 19 to 23 from YEC's opening statement which said: "Except for the recommendation to install underground power distribution lines, which YEC will discuss and seek to have revised, Yukon Energy's current plans accommodate all of the YESAB DSR recommended terms without any discernible adjustment to design or cost."

<sup>65</sup> CW argument, paragraph 32 b.

<sup>66</sup> Exhibit B-13, Appendix A – Update to YUB-YEC-1-4, March 27, 2014, page A-1.

<sup>67</sup> Exhibit B-13, Appendix A – Update to YUB-YEC-1-4, March 27, 2014, page A-3.

In argument<sup>68</sup>, YEC stated that the near-term forecast fuel cost savings from 2015 to 2018 were not challenged in the hearing and noted that the prices for gas (LNG) in the forecast and in the economic analysis were about 20-percent higher than actual gas prices over the previous six months. Further, YEC added that the spread between natural gas and crude oil prices is likely to sustain for the next 20-plus years. YEC cited U.S. Energy Information Administration (EIA) information included on pages 40 and 41 of the Application to support that assertion<sup>69</sup>. YEC later added that the viability of the Project does not rely on the oil-gas price spread “going out 10 to 20 or 30 years. The Project’s viability is forecast to occur within the first four years and, thereafter, the Project provides Yukon ratepayers with the option to use gas whenever it is less costly than diesel”.<sup>70</sup>

### 3.5.2.1 Views of interveners

UCG stated that predicted savings from the Project are based on “the anticipated differential between the price of natural gas and diesel, but also from the increased generation and the increased load that will be used for capacity building.”<sup>71</sup>

It was noted by UCG that Figure 4-2<sup>72</sup> of the Application showed “extensive price volatility over the last seven or 8 years”<sup>73</sup>. UCG disagreed that the price of natural gas was predictable over the short term and particularly over the long term. Given the volatility of gas prices, UCG questioned the potential savings and suggested that in terms of the savings, “you might consider how easily they may be toppled by that price volatility.”<sup>74</sup>

Further, UCG referred to YEC’s response to UCG-YEC-1-5(c) which showed actual diesel generation at Whitehorse in 2010 to 2013:

**Table 4. Whitehorse Diesel Generation**

Year	Whitehorse Diesel Generation (GW.h)
2010	2.417
2011	6.570
2012	2.205
2013	0.840

<sup>68</sup> YEC Argument, Transcript, April 2, 2014, page 457-458.

<sup>69</sup> See also the response to UCG-YEC-1-13(c), which states that Figure 86 of AEO2013 shows that Henry Hub spot natural gas prices are expected to increase annually through the forecast period. It should also be noted that oil prices are also expected to increase and Figure 87 of AEO2013 provides the ratio of Brent Crude Oil Price to Henry Hub Spot Natural Gas Price in Energy equivalent Terms as reviewed in the application. Figure 4.2 on page 41 of the application shows over the long term (approximately 2020-2035) that the ratio of Brent Crude Oil Price to Henry Hub Spot Natural Gas Price in Energy equivalent terms is approximately 4.

<sup>70</sup> YEC Argument, Transcript, April 2, 2014, page 460, lines 13 to 17.

<sup>71</sup> UCG Argument, Transcript, April 2, 2014, page 483, lines 10 to 13.

<sup>72</sup> Application, Figure 4-2: Ratio of Brent Crude Oil Price to Henry Hub Spot Natural Gas Price in Energy Equivalent Terms, 1990-2040, page 41.

<sup>73</sup> UCG Argument, Transcript, April 2, 2014, page 483, lines 20 to 21.

<sup>74</sup> UCG Argument, Transcript, April 2, 2014, page 484, lines 10 to 12.

UCG also cited the following YEC testimony:

To assume that as you might do for resource planning base case that you would simply keep using diesel or LNG, would not be an appropriate assumption in terms of what would be really expected over time. And at some point, new renewable resources will come onto the system to displace use of thermal resources. When, which and how much cost we don't really have a basis for forecasting because there's so many variables that could play with it.

So if the project can be shown to be viable and recovering its key costs within four or five years, our conclusion was that that's -- if that's sufficient to make the point about the project's viability, let's not get into a whole bunch more complexity than we need to to establish the point.

But for development of renewables, transition in the future is an energy-focused exercise. I hope we've got that point across. And that will displace the need to keep relying on thermal units for energy. It will not displace the need to make sure you have reliable capacity that can be flexible and reliably turned on by an operator when required.<sup>75</sup>

Based on the above, low Whitehorse diesel generation, and the potential volatility for gas prices, UCG argued that given the high volatility of gas prices and the low actual generation amounts, the predicted savings for ratepayers may not eventuate<sup>76</sup> and thus the four- to five-year project viability that YEC has touted may not come to fruition.

UCG asserted that given that the Project is driven by capacity<sup>77</sup> and, in future could be replaced by renewables, as noted in the citation above, and not fuel savings, a New Diesel alternative would achieve the same result.<sup>78</sup>

YCS/LE argued that the issue is the price of diesel delivered to Whitehorse versus the price of LNG delivered to Whitehorse. When the delivered price of LNG to Whitehorse exceeds the delivered price of diesel to Whitehorse, then fuel savings will fail to occur. In addition, YCL/LE stated:

So when you think of that, your crossover point for when the project economics may flip has to take into consideration the cost of converting it into LNG and transportation.

Similarly, when you're looking at the crude oil price you have to take into account you have to refine it into diesel and you have to transport it to Whitehorse. And it's essential to remember that it costs a lot more in terms of the percentage of commodity price to turn natural gas into LNG and transport to Whitehorse than it does for diesel to be refined and transported to Whitehorse.<sup>79</sup>

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<sup>75</sup> Transcript, March 31, 2014, Mr. Osler cross-examined by Mr. Janigan, page 102, line 7 to page 103, line 2.

<sup>76</sup> UCG Argument, Transcript, April 2, 2014, page 485, taken from lines 12 to 21.

<sup>77</sup> Transcript, March 31, 2014, page 143 at line 14 where YEC confirmed that the Whitehorse Diesel to Natural Gas Conversion Project is about capacity.

<sup>78</sup> UCG Argument, Transcript, April 2, 2014, page 486, lines 2 to 8.

<sup>79</sup> YCS/LE Argument, Transcript, April 2, 2014, page 502, line 21 to page 502, line 6

YCL/LE concluded by noting the lack of experience of the YEC panel regarding crude oil and natural gas prices and added that for purposes of YEC's business case the use of the average price for natural gas is not as relevant as using the winter prices for natural gas.<sup>80</sup>

YEC replied to UCG argument regarding actual diesel generation as follows:

And as this Board fully knows, given its ruling, looking at diesel generation, ratepayer savings, and costs are determined by long-term average, not actual diesel. Water variability is not a risk that the Board or ratepayers need to consider when assessing the prudence or of the viability of the project.<sup>81</sup>

In response to YCS/LE, YEC stated, "There is no evidence to suggest transportation costs that Yukon Energy has put forward in this application is incorrect"<sup>82</sup> and added "the liquefaction portion of the landed -- if I can put it that way -- the landed LNG cost into Whitehorse, that liquefaction is a regulated rate. It's not a rate that's going to be subject to change on willy-nilly on somebody -- on market base or anything else."<sup>83</sup>

In terms of the forecasts from the EIA and the NEB, YEC contended that YCS/LE did not put any evidence forward that substantially differed from the NEB and EIA forecasts.

### 3.5.2.2 Views of the Board

The Board notes the following exchange between UCG and YEC:

Q. Okay. Now, would you agree with me that the natural gas prices since 2006 have shown a lot of variation?

A. MR. OSLER: Yes.

Q. And in brief, you've seen spectacular decreases since 2006 with the coming onstream of shale gas and, of course, you've seen a bit of retreat in those price decreases in the last year or so largely driven by demand. Would you agree with that?

A. MR. OSLER: Yes. There was a material change in the natural gas market in North America.

Q. I guess the difficulty we're having is that given the degree of change over the last eight to ten years or so, how can we view with confidence your estimates based on a fixed price of 4.5 per million Btu?

A. MR. OSLER: Well, the short answer is because the analysis indicates that the overall answer in the key conclusion is very robust to changes in that number. It's not dependent on \$4.50 AECO price. That's the short answer.

The more important point substantively, in my view, is to what extent can you be comfortable that there will remain a differential between the price of oil, which is

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<sup>80</sup> YCS/LE Argument, Transcript, April 2, 2014, the context was taken from page 503 to 506.

<sup>81</sup> YEC Reply Argument, Transcript, April 2, 2014, page 538, line 24 to page 539, line 4

<sup>82</sup> YEC Reply Argument, Transcript, April 2, 2014, page 545 lines 12 to 14.

<sup>83</sup> YEC Reply Argument, Transcript, April 2, 2014, page 545 lines 16 to 20.

reflected in diesel, and the price of gas. Because the issue isn't whether it's 4.50 for gas or 5.50 for gas or 3.50 for gas, it's how big is the saving compared to diesel.

And the report, the filing addresses this on pages 40 and 41. And there have been some questions, and I'm sure there will be more during the course of this hearing, on this matter.

And I will just say it succinctly for now because I'm sure we'll come back to it. The evidence that we've been able to see suggests strongly that projections made by leading American government agencies, the Canadian government agencies see this price potential being three times or more for at least three decades.<sup>84</sup>

The Board also notes the following exchange between YCS/LE and YEC:

Q. Would YEC take any steps to hedge the price of natural gas risk over the long term?

A. MR. OSLER: YEC at the moment is starting a project with a minimum amount of requirements for gas relative to everything else that we're looking at on this page in terms of other projects.

I assume that YEC in the future, if this project is approved and other elements emerge, that this isn't a flash in the pan in terms of modernization, then YEC would from time to time assess its options in terms of how best to secure for ratepayers security on the price of gas.

Q. I'd like to go back to the application page --

A. MR. OSLER: Can I finish the other part of your question?

Q. Go right ahead.

A. MR. OSLER: All I got to was the point about -- the part of the quote that said -- dealing with export opportunities from British Columbia and other people doing LNG facilities, stuff as Ferus and AltaGas, looking at it, and Fortis.

The other part of it is that the forecast that we have available to us and that we've been advised about, one of which we put in this report, show that independent agencies away from the people that are trying to do these export developments, and aside from the British Columbia government and its own interests, that the EIA receive that graph. They're looking at the spread between the price of international oil, Brent, on a million BTU basis, not a barrel basis, and the price of natural gas, Henry Hub United States million dollars per BTU -- dollars per million BTU, sorry -- that this spread was not that great in recent decades and it's going to be quite significant for the next two to three decades.

The National Energy Board in Canada, in its November 2013 report on Canada's energy future, also provided its own updates of forecasts for oil and gas. It used the Henry Hub from the United States, but it used the West Texas intermediate crude for oil which is a bit lower today. They, too, when you look at that forecast, end up with a spread. It's greater than 3 through 2035.

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<sup>84</sup> Transcript, March 31, 2014, page 107, line 15 to page 109, line 24

The point of view of people who are not purporting to be experts in the oil and gas business but using due diligence and prudence to look at what information is available to leading government agencies in the United States and Canada by people who are experts on this subject, the best information we can provide the Board is that this spread is going to be expected to be maintained for several decades as just discussed through 2030, 2035, 2040. That doesn't prove it will happen.<sup>85</sup>

The following testimony is also of note:

Q. Now, if you move on to page 7 of the application and the second paragraph, the second sentence: (as read) "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 the ratepayers in 2015."

And then in footnote 7 it states that: (as read) "The estimate based on long-term average thermal generation of more than 14 gigawatt hours for base case load forecast no Alexco..."

And it goes on, that footnote. Now, can you confirm that the base case load forecast also includes long-term average hydro generation?

A. MR. OSLER: Yes, base case load for default diesel does, yes.

Q. And can you confirm that, all other things being equal, the potential fuel savings would decrease if actual hydro generation is above the long-term average, and potential savings would increase if actual hydro generation is below long-term average?

A. MR. OSLER: From the point of view of ratepayers, the impact on costs would be the same regardless of what the actual hydro is, because it will go in and out of DCF, diesel contingency fund. In the context of actual diesel requirement, it will vary depending on whether the actual hydro is higher or lower.

But the long-term average is used to try and allow everybody to plan without having to worry about forecasting exactly where the water is going to be and also to evaluate projects like this on that basis. So it was used here because the ratepayer -- rate level would reflect that.

It would require someone to file an application and have it reflected in rates is the assumption that needs to be added.

And it would have -- I mean, this analysis here -- I would tend to rely more on table 4-3 than this analysis. This emerged at one point as a focus of what's at stake in the winter of 2014-15 -- is it material? Yes, it's material because that's when what we do modest of our long-term average stuff, blah, blah, blah.

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<sup>85</sup> Transcript, April 1, 2014, page 250, line 12 to page 252, line 10.

But the actual economic analysis is done later and more thoroughly in 4-3. So I would tend to pass over this particular element as not being the main point that people need to do to assess the value of the project. It just highlights that it's relevant based on the long-term average this coming winter.<sup>86</sup>

The Board considers that the evidence on the record, from the EIA and NEB, shows the continuation of a spread of prices between crude oil and natural gas, and by extension, between the price of diesel and LNG. Both the NEB and EIA are independent bodies without vested interest in this proceeding. No evidence has been presented refuting the existence or the continuance of the oil-gas spread. Although the continuance of such a spread is not a guarantee, and the potential elimination of such a spread is a potential risk that could affect ratepayers, the Board is satisfied that on the balance of probabilities, the risk is low.

Further, although the evidence confirms the recent volatility of gas prices, it does not show the elimination of oil-gas price spread, nor is there any evidence that indicates that oil prices are any more stable than gas prices, or more particularly, LNG and diesel prices.

Finally, in terms of fuel cost savings, there was discussion about recent actual thermal generation being less than LTA forecasts. As noted above, any differences between LTA and actual thermal generation, based on deviations from LTA hydro generation, are accounted for through the Diesel Contingency Fund (DCF) account. Therefore, the savings will either occur through actual thermal generation or nominally through the DCF account.

Based on this proposed change in thermal generation (from diesel to LNG), YEC will have to update the parameters for the DCF account and ensure that ratepayers are not at risk for any errors in assumptions, calculations, and conversions contained in the DCF account.

The last issue pertaining to potential fuel cost savings is the transportation costs to bring LNG to Whitehorse. In its opening statement and in the March 27, 2014 update to the Application, YEC provided evidence that the source of LNG supply was changing from Calgary to Delta, BC. In addition, YEC provided evidence of two transportation options the use of A-trains, which currently are not approved for use in Alberta and BC, and the use of Tridem units which are approved for use in BC, Alberta, Yukon and NWT.

After reviewing the evidence in the Application and from page A-3 of the March 27, 2014 update, the Board is satisfied that the change in supply location or the type of transportation (A-train versus Tridem) does not materially alter the potential fuel cost savings for the Whitehorse Diesel to Natural Gas Conversion Project. The evidence shows further potential savings on transportation costs if LNG is supplied from locations closer to Whitehorse, such as Dawson Creek or Fort Nelson.

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<sup>86</sup> Transcript, April 1, 2014, page 413, line 7 to page 415, line 7.

### **3.5.3 Grid Load Risks**

Forecast fuel cost savings can be impacted if load grows by an amount lower than forecast or similarly if forecast thermal generation is less than the LTA forecast of 17 GW.h for 2015. The LTA thermal generation forecast is dependent on the LTA hydro generation. Any deviation from the LTA hydro generation will have a direct impact on potential fuel cost savings.

#### **3.5.3.1 Views of the Board**

The impact of load growth being less than forecast was not challenged in this proceeding. Table 4-2 of the Application [Forecast Base Case (No Alexco) New Grid Capacity Requirement (2015-2030)] was used by YEC to show that the primary driver for the Application is capacity, namely the requirement to replace retiring thermal units used primarily for capacity and peaking purposes. The Board accepts that the need for capacity is the primary objective for the Project. Impacts of fuel cost savings were discussed in the preceding section.

### **3.5.4 Risks Related to Regulatory Schedule Delays**

Risks in this category either increase capital costs or reduce potential fuel cost savings. For example, regulatory bodies may impose conditions that can increase capital costs to the Project, cause delays that can cause contractual penalties resulting in additional capital costs, or may cause delays such that forecast fuel cost savings may be deferred.

#### **3.5.4.1 Views of the Board**

Regulatory and schedule risks were discussed on page 39 of the Application and in response to YUB-YEC-1-2. If the Project does not proceed on schedule, risks include potential lost fuel cost savings<sup>87</sup> and sunk costs, before recovery, of \$19.8 million. In its opening statement, YEC also stated:

On March 19, 2014, the YESAB draft screening report was issued, recommending to the Government of Yukon, the Decision Body, that the Project be allowed to proceed without a review, subject to eight terms and conditions recommended in the report. The Executive Committee noted that the relatively few recommendations in its report are indicative of the comprehensiveness of Yukon Energy's commitments.<sup>88</sup>

With the YESAB draft screening report recommending the Project be allowed to proceed, and as discussed previously, with the exception of the recommendation that the power lines for the LNG site be located underground, the Board is of the view that from a regulatory perspective, regulatory risks and schedule risks are not an impediment or a significant risk to this Project.

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<sup>87</sup> Application, page 39

<sup>88</sup> Exhibit B-14, YEC Opening Statement, March 31, 2014, page 8.

### 3.5.5 Security of Supply

In the application<sup>89</sup>, YEC assumed transportation costs would be from the Shell Canada Jumping Pound facility near Calgary. As noted earlier, Shell Canada has decided not to proceed with the Project and YEC has made supply arrangements with the FortisBC Tilbury facility in Delta, BC.

In argument, YEC noted that there is little risk with respect to security of supply of LNG. YEC submitted:

... in our submission the evidence that's -- clearly demonstrate that Yukon Energy has a secure and cost-effective supply of LNG from FortisBC's plant at Tilbury. This is an actual operating facility, and the LNG will be secured under a cost base rate that has been set by government (OIC). This is not going to be a market base rate. This is a cost base rate. And as you heard in the cross-examination and answers to the cross-examination, this rate is subject to small annual inflation-related increases. So this is a secure cost base rate, which should be a very fundamental and positive point from the perspective of Yukon Energy and Yukon ratepayers.<sup>90</sup>

YEC further submitted that there is excess capacity at the FortisBC plant and that the FortisBC plant is undertaking a major expansion.

In addition, YEC stated that in cooperation with NT Energy (in terms of transportation costs and supply options), near-term lower cost LNG supply options with both AltaGas and Ferus and potential locations in Edmonton, Grande Prairie, Dawson Creek and Fort Nelson provide further opportunities to reduce risks regarding security of supply.<sup>91</sup>

YCS/LE argued that by choosing a single fuel generator as YEC has done, YEC loses flexibility in the management of those units if there is an interruption in fuel supply or if the landed cost of the price of the specific fuel spikes relative to the landed cost of an alternative fuel.<sup>92</sup> YCS/LE added that YEC's supply of LNG (from Delta, BC) is illiquid, implying that currently it can only be obtained from one source, and that source is regulated by Rate Schedule 46,<sup>93</sup> and is subject to the terms and conditions of that particular tariff. In this instance, YEC is acquiring its supply on a spot basis.

In reply argument, YEC responded to these arguments as follows:

The evidence of Mr. Morrison in effect was about what is the level of capacity that you have in your facility?

Remembering in the back -- and back of the point is should I have a contract rate or should I go with the spot rate? What is the level of capacity? That was the

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<sup>89</sup> Application, page 38.

<sup>90</sup> Transcript, April 2, 2014, page 453, lines 2 to 14.

<sup>91</sup> YEC Argument, Transcript, April 2, 2014, page 456 to 457.

<sup>92</sup> YCS/LE Argument, Transcript, April 2, 2014, page 497, lines 6 to 16.

<sup>93</sup> Exhibit C4-8, Section 3.4 of FortisBC Energy Inc. Rate Schedule 46 states: Spot LNG Service Availability – Spot LNG Service is the lowest priority LNG Service and will be conditional based on the availability of sufficient capacity remaining after deducting the Contract Demand from all LNG Agreements for Long-Term LNG Service and Short-Term LNG Service from the Available LNG Capacity. FortisBC Energy is under no obligation to reserve or set aside Available LNG Capacity for either new or existing Spot LNG Service. The customer may request Spot LNG Service without contracting for Long-Term LNG Service or Short-Term LNG Service.

assurance that Mr. Morrison was looking for and you heard what the evidence he gave, that there was more than sufficient capacity, not only now but over the next two years because of the increasing capacity of level and the ability to enter into contractual arrangements if that's what needed to happen.<sup>94</sup>

### 3.5.5.1 Views of the Board

The Board notes the following YEC testimony:

Is it fair to say that the Tilbury LNG facility is currently the only LNG facility in Alberta and British Columbia that sells LNG to third parties?

A. MR. OSLER: I'm not sure that's technically correct, but from the point of view of being a practical supply option, it is correct. There may be some ability to pick up LNG from a couple of other sources, but they wouldn't be material for the purpose of this conversation.

Grande Prairie, Ferris, EnCana will start operating very, very soon, but again, I'm not sure we would view them as an option, but they have a material supply capability and they are selling to third parties -- they will be selling to third parties as part of their business plan.

Q. They will be, but currently they're not because they're not in operation.

A. MR. OSLER: They're commissioning right now, yes.<sup>95</sup>

The Board is satisfied with the evidence submitted by YEC that there is sufficient supply capacity at the FortisBC Tilbury LNG facility to meet YEC's needs in the short term. The Board also accepts the likelihood of more LNG facilities coming on-stream in the near term to provide YEC with additional supply options.

### 3.5.6 Safety

Section 3.4 of the Application provided a summary of environmental and socio-economic impacts. The following is noted:

The YESAB Project Proposal Submission (Chapter 7, Section 7.6) acknowledges that LNG has not previously been stored, nor natural gas used as a fuel, in Yukon. However, design, construction, operation and safety standards and regulations for LNG have been made increasingly stringent in North America over the last 40 years to prevent LNG accidents and minimize impacts should they occur. LNG facilities are also subject to numerous regulations to ensure health, safety and security of the environment and that the Canadian public are protected. LNG facilities must meet all standards, codes and regulations enforced by federal, provincial/ territorial or municipal jurisdictions (described in the YESAB Project Proposal Chapter 6, Section 6.6), including specific requirements set out in the *Yukon Gas Processing Plant Regulation*.<sup>96</sup>

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<sup>94</sup> YEC Reply Argument, Transcript, April 2, 2014, page 546, lines 9 to 20.

<sup>95</sup> Transcript, March 31, 2014, page 172, lines 1 to 17.

<sup>96</sup> Application, page 14 to 15.

It later concluded:

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.<sup>97</sup>

YEC stated the following regarding safety:

Safety issues and concerns regarding accidents and malfunctions are comprehensively reviewed in the draft screening report -- which, by the way, for the record is at Exhibit B-11. The YESAB executive committee has determined in its draft screening report that the project will not result in significant adverse effects to safety considering the mitigations proposed by the proponents in compliance with the non-discretionary legislation.<sup>98</sup>

YEC further added:

In summary, LNG leaks, spills and the potential effects will be systematically addressed and planned for during all phases of the Project. The demanding regulatory requirements include comprehensive management, prevention, and contingency planning, such that the adverse effects discussed in this section are highly unlikely. The safe operation of LNG facilities is supported by the industry's safety record, which is regarded as having the best safety record of any of the energy industries (Sovacool 2008).<sup>99</sup>

YEC concluded that the safety issue has been dealt with, comprehensively by YESAB.

### 3.5.6.1 Views of Interveners

CW requested that the Board include conditions regarding the following. CW submitted that YEC should work collaboratively with the Fire Marshal's Office and CW's fire department in developing and implementing fire suppression measures at the LNG project site, including the development and implementation of an emergency firefighting program. CW further submitted that YEC should be directed to comply with all industry

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<sup>97</sup> Application, page 15 to 16.

<sup>98</sup> Transcript, April 2, 2014, page 464, lines 12 to 19.

<sup>99</sup> Exhibit B-11, Attachment 4 draft screening report and Recommendation for the Whitehorse Diesel to Natural Gas Conversion Project (Project Assessment 2013-0115) (YESAB), Section 7.0 Safety, page 71 of 115.

best practices associated with the handling, storage, transportation and disposal of all odorant and odorant containers. Respecting emissions, CW submitted that YEC should not only monitor emissions associated with the Project, but should be required to take all reasonable steps to minimize emissions and air pollution caused by the Project.<sup>100</sup>

### 3.5.6.2 Views of the Board

The Board notes the following:<sup>101</sup>

Q. Okay. Is YEC aware of any analysis of emissions from LNG-fueled generators that could cause respiratory problems for people and animals living near such a plant?

A. MR. MORRISON: Mr. Chair, the emissions issue, from our perspective, has been thoroughly in a detailed manner dealt with by YESAB. We've provided what we, I think, earlier referenced by Mr. Osler as to what those emissions are, and the health, safety, environmental concerns related to emissions have been addressed by YESAB. We can look in the report and find some reference to it if Mr. Janigan would like, but I think the matter's been dealt with.

Q. Okay. Let's put it this way. YEC is satisfied that the YESAB report deals with this issue in a way which is conclusive for them?

A. MR. MORRISON: I believe so.

A. MR. OSLER: And they deal really in different headings. Emissions -- they also deal with health and safety in great detail. So very comprehensively.

With regard to safety, the Board notes the following YEC testimony:

Q. Okay. Thank you. One of my last questions here is yesterday in Washington, Oregon, an LNG plant, there was a fairly large explosion that took place displacing hundreds of people and they had to evacuate homes and many other areas around there. It also required that the highways and railways had to be shut down and, of course, it didn't go into what they call a major explosion. If it would have gone into the tank, it would have probably gone, they say, at least a kilometre across which means that our dam, Riverdale, even our hospital would be affected.

This just happened yesterday. I don't know if you've heard. And I'm just wondering what kind of plans has YEC -- are they planning to put in place to ensure the safety of, first of all, our workers, our employees who work for us there at the Yukon Energy, Riverdale residents, and the City of Whitehorse and our airport? What plans have you got in place now or in the process of setting up?

A. MR. CAMPBELL: Sure. As part of our application for a gas license through the oil and gas branch of the Yukon government, they have a very strict requirement to ensure the safety, the safe operation and maintenance of the facility, safe for the public, safe for our staff.

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<sup>100</sup> City of Whitehorse argument, April 1, 2014, paragraph 32, parts d, e, and f.

<sup>101</sup> Transcript, March 31, 2014, page 112, lines 6 to 23.

We've developed spill response plans that have been filed with the oil and gas branch. We've developed emergency response plans. We're working with both the government -- Yukon government fire marshal and the City of Whitehorse fire department for a fire response plan. We're installing an underground sprinkler -- or an underground fire water system around the facility, not to fight an LNG fire, but to fight an external fire if, in fact, that was to occur. That will protect the site.

There are four safeguard levels of security in terms of preventing dangerous incidents from occurring. There's a leak. There's a spill containment. That spill is taken to a remote pit. It is analyzed in terms of the capacity of the pit to contain a spill from the largest tank.

If there was a second incident and the LNGs -- well, the LNG that drained into the remote tank caught fire, the shape of the pit is designed to contain the fire and to -- and precursor to that to contain the vapour cloud within the confines of the property.

There is a very sophisticated model run in terms of if there was a fire, what would be the potential damage around the site? That is all contained and we are in the process of obtaining some no-build easements a little bit on to the Robert Service Way easement side and with the White Pass side to ensure there is no potential for damage to any permanent structures.

In a worst case, two things going wrong, which is the worst probable case event that's accepted by both the LNG safety standards: Have they been accepted by YESAB as the worst probable case is not an explosion? It cannot and will not happen at this facility because it is designed not to happen and it will be operated in a way not to happen.

Q. Those are all kind of speculations. They're designed but things do happen?

A. MR. CAMPBELL: Well, this is based on 50 years. LNG has been around North America for over 50 years and there are very, very well-developed procedures. There have been very few incidents with LNG, and every one has been analyzed and these governing codes are extremely prescriptive, deal with that, and these codes are reviewed about every two years.<sup>102</sup>

The Board is satisfied that safety and environmental issues discussed above were considered in the YESAB process. Further, YEC has demonstrated that by complying with existing regulations and other requirements, working with the Yukon government and City of Whitehorse, and adopting the recommendations from the YESAB draft screening report, as well as through the design of the Project, YEC will be minimizing any risks from a health, safety and environment perspective. Moreover, considering the above, the Board finds that it is not necessary to impose the conditions<sup>103</sup> requested by CW.

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<sup>102</sup> Transcript, April 1, 2014, page 326, line 22 to page 328, line 9.

<sup>103</sup> City of Whitehorse argument, April 1, 2014, paragraph 32, paragraphs a, b c, d, e and f.

## 4 ALTERNATIVES TO THE LNG PROJECT

The Board will determine in this section and advise the Minister on project alternatives, if any exist, given the reasonable load assumptions and risk assessments in the previous sections.

### 4.1 Views of YEC

In terms of alternatives to the Project, YEC stated that two options: the status quo and the use of renewable resources, were not feasible alternatives currently. There remained two diesel alternatives which, when compared to the Project, were more costly. They were life extension of the existing units and a new diesel-only project.

### 4.2 The Status Quo

Under the Status Quo alternative, YEC would not retire the two existing Mirrlees units, WD1 and WD2, as scheduled in 2014 and 2015. YEC asserted that retention of the two units beyond planned retirement would expose its customers to unreliable generation capacity,<sup>104</sup> as well as higher O&M and fuel costs, and replacement or life extension of these units would be required as soon as feasible — i.e. by late 2015 at the latest. YEC explained that the Status Quo option was not a feasible alternative and was unacceptable in terms of meeting the reserve capacity planning criteria due to the units' unreliability associated with end-of-life issues.

YEC pointed out that the last major life extension of these two units was undertaken in 1999. YEC stated that the WD1 and WD2 engines have seen little use since the 2006 Resource Plan was completed. That plan identified the two units as needing either life extension or replacement.

However, YEC noted that, after virtually each monthly mandatory start-up of the engines, small component failures and engine oil coolant leaks need to be fixed. YEC stated that the seals on the engines aren't tight anymore, parts are worn and replacements are difficult, if not impossible, to get.

YEC also stated that, in discussions with its operating staff, they had said that the two units failed to start about 50 percent of the time when they tried to start them.<sup>105</sup> YEC added that their staff has said they failed more often if they didn't have an operator standing beside them to ensure all the valves were open and that all the pressures were correct. The two units virtually wouldn't start on their own, which was a concern when an operator was not in the plant and the control centre needed to start the units.

YEC stated that, in reaching its decision to retire the two units, it had consulted with its engineering and operating staff and relied on their analysis and opinions.<sup>106</sup> Although it had not prepared a formal report on the units' retirement, it had the operating history of the units and mechanical work orders for the units, and relied upon the experience and knowledge of its operators.

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<sup>104</sup> Transcript, April 1, 2014, page 409 to 411.

<sup>105</sup> Transcript, April 1, 2014, page 201 to 202.

<sup>106</sup> Transcript, March 31, 2014, page 134 to 136.

YEC pointed out that, in continuing to operate the units, it wasn't just an issue of cost. It was also the ability to get parts, and to get them in a timely manner. Over time, this situation had deteriorated to the point where YEC wasn't prepared to support continuing to do this.<sup>107</sup>

YEC also pointed out that in an emergency, the engines cannot be just barely okay to operate; they have to be in tiptop condition when they are required.<sup>108</sup> If they are not in tiptop shape, then YEC has to turn its efforts to trying to fix engines that are not operating at 100 percent, instead of concentrating on getting the power back on. YEC stated that it was not prepared to take that chance with these generating units any longer, since the consequences for its customers were too great.

### 4.3 Life Extension (Refurbishment)

YEC stated that life extension (refurbishment) of units WD1 and WD2 was another alternative that it had considered. YEC stated that it considered this alternative not to be practical or cost effective due to the increasing lack of parts for these 46-year-old engines as outlined above. YEC stated that, based on its experience in refurbishing the other two Mirrlees units, WD3 and FD1, support for these units both from the Original Equipment Manufacturer (OEM ) and aftermarket suppliers was questionable and not likely to improve. YEC noted that the manufacturer of these units had ceased production of this model of unit at least 15 years ago.<sup>109</sup>

YEC cited long delays in delivery of parts, issues with quality control of those parts and lack of support in the maintenance of these engines, all of which contributed to the refurbishment of WD3 and FD1 taking a year longer than it should have otherwise. This experience had contributed to YEC's decision to prefer replacement of the units over refurbishment. Additionally, YEC stated that, with refurbishment, some balance of plant work would be required as part of the Project, as foundations under WD1 and WD2 continued to deteriorate and other off-engine systems serving these units are at their end of life as well.

YEC also cited other factors affecting refurbishment of these units besides the availability of parts. They were:

- life extension of both units would only provide 9 MW of the forecast capacity requirement for at most 10 years. Additional new capacity would be needed in 2016, with a least 4 MW of new additional capacity required by late 2017. The full 9 MW of capacity provided by the refurbishment would also need to be replaced by late 2024.
- expected grid diesel generation requirements (based on LTA hydro) would be supplied during this 10 year period by relying on other diesel units — i.e. use of WD1 and WD2 would likely be avoided, other than for an emergency. This diesel-based energy would be supplied at the currently approved average fuel cost of 28.7 cents/kW.h. For example, in the 2015 Base Case where the default diesel requirement is forecast to be 17 GW.h, the resulting fuel cost to

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<sup>107</sup> Transcript, April 1, 2014, page 311 to 316.

<sup>108</sup> Transcript, March 31, 2014, page 131-134.

<sup>109</sup> Transcript, March 31, 2014, page 60 to 63.

supply that energy would be \$4.9 million. In other words, with refurbishment, there would be no fuel cost savings associated with the greater efficiency of either a new diesel or new LNG plant.

- an updated cost assessment, based on YEC's experience with the refurbishment of the WD3 and FD1 units, suggests that extending the 9 MW-rated capacity of these units would likely have a capital cost of at least \$6.75 million (\$0.75 million/MW), a 50 percent per Megawatt increase over the previous project, with risks that actual costs would exceed this amount. On a per-Megawatt basis this was about one-half the cost of a new diesel unit (\$1.5 million/MW) with a 40-year operating life as compared to a 10 year extended operating life for the refurbished unit.<sup>110</sup>

YEC did not consider refurbishment of WD1 and WD2 units to be a feasible alternative to the proposed LNG Project or New Diesel alternative.

#### **4.4 Views of the interveners on the Status Quo and Life Extension Alternatives**

As discussed in the Views of the Interveners in Section 3.1.2, the interveners questioned the timing of the need for new generating capacity in part in the context of the condition of the existing two Mirrlees diesel generating units.

UCG stated that it understood the need to be able to supply backup and emergency power for drought relief and whenever there are problems on the system to enable YEC to provide service to all parts of their system. UCG also stated that the current two Mirrlees units were providing that capacity and, while there will be a need to replace these engines with some other alternative in the near future, it disputed the extent and timing of that new capacity as presented in the Application.<sup>111</sup>

It stated that the timing and extent of the need for new capacity was in doubt, in part, because YEC had been extraordinarily reticent with respect to evidence respecting the condition of the existing engines. UCG noted that YEC had not presented a consolidated report on the condition of the engines addressing different aspects of the wear and tear on the engines, done in a fashion expected of a company like YEC. Instead, YEC had recounted discussions with its staff regarding the condition of the units in citing the need to replace the units.

UCG accepted that the 46-year-old engines would likely have to be replaced, possibly in the short term, but given YEC's lack of evidence on their current condition, UCG disputed YEC's assertion that they had to be replaced immediately.

In addition to the timing of the need for new capacity, UCG questioned the amount of capacity needed. UCG stated that it expected a greater commitment to reducing the load that is generating the need for new capacity, particularly with respect to DSM. UCG noted that the degree of commitment by YEC to DSM, and what DSM was likely to achieve as shown in YEC's load forecast for the next four years was not good enough.<sup>112</sup>

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<sup>110</sup> Also see YUB-YEC 1-13(a).

<sup>111</sup> UCG Argument, Transcript, April 2, 2014, page 478 to 479.

<sup>112</sup> UCG Argument, Transcript, April 2, 2014, page 480 to 481.

UCG believed that YEC had downplayed the ability to request that some industrials rely on their own diesel in case of an emergency and that, while that may not mean that existing capacity did not need to be replaced, it may be an additional factor in determining how much capacity is needed and when it is needed.<sup>113</sup>

YCS/LE stated that YEC had known about the need to replace the Mirrlees units since 2006. YCS/LE argued that it appreciated that the units needed to be replaced but that the urgency YEC associated with the Project was unwarranted.<sup>114</sup> There had been plenty of time for YEC to sort out and look at alternatives. YCS/LE also argued that, while the Mirrlees units weren't in the best of condition, they were usable. YCS/LE pointed out that, when asked, YEC had failed to come up with evidence that the units had been subject to major failures during monthly run-up and operating tests carried out by YEC in the period from 2010 through to 2013.<sup>115</sup>

Mr. Roberts stated that he understood that there were going to be breakdowns and that YEC needed reliable backup capacity for emergencies.<sup>116</sup> He added that the replacement of the Mirrlees units had become an emergency issue in the last year but questioned why that had happened, given these units were supposed to be decommissioned 10 or 12 years ago and yet were still running.<sup>117</sup> He stated that it was important to question why this urgency was a factor today.

#### **4.5 Views of the Board on the Status Quo & Life Extension Alternatives**

The Board agrees with the interveners that it would have been helpful to have a written report that dealt with the issues affecting the operation of the two Mirrlees units and end-of-operational life issues. Nevertheless, the Board has reviewed YEC's evidence regarding the operation and maintenance of the units and the arguments of the interveners regarding those matters and is satisfied that the evidence is sufficient for it to make a determination regarding the condition of the WD1 and WD2 units.

Based on the evidence, the Board considers that the risks of using these units to provide reliable system backup capacity to YEC's customers, during a system emergency, are too high. Although still functioning, the Board is of the view that the two Mirrlees units, WD1 and WD2, in their current physical state, are at the end of their 46-year operational life and there exists better, more feasible alternatives for providing replacement capacity. Therefore, the Board finds the Status Quo alternative unacceptable.

The Board has reviewed YEC's evidence, that the Life Extension alternative would cost at least one-half as much as new generating capacity, and would have a life of only 10 years.<sup>118</sup> Under those circumstances the efficiencies and operational fuel cost savings of new units would not be realized and the diesel energy needs of the system would have to be provided by other existing diesel units at existing diesel costs. The Board accepts YEC's evidence on these matters.

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<sup>113</sup> UCG Argument, Transcript, April 2, 2104, page 481.

<sup>114</sup> YCS/LE Argument, Transcript, April 2, 2104, page 493.

<sup>115</sup> YCS/LE Argument, Transcript, April 2, 2014, page 496 to 497.

<sup>116</sup> Roberts Argument, Transcript, April 2, 2014, page 526.

<sup>117</sup> Roberts Argument, Transcript, April 2, 2014, page 530.

<sup>118</sup> Application, page 24 to 26, also YUB-YEC 1-13(a).

The Board notes YEC's statements regarding the difficulties it had in the life extension project it carried out on the WD3 and FD1 Mirrlees units, both in terms of sourcing replacement parts and obtaining support for its refurbishment efforts. They also currently experience difficulties and delays in obtaining replacements and parts for the Mirrlees units. The Board accepts YEC's evidence on this matter.

The Board considers highly questionable the feasibility, both in terms of timing and costs, of carrying out a successful life extension project to the WD1 and WD2 units. The Board is of the opinion that the risks of such a project providing sufficiently reliable service at acceptable costs to YEC's customers are too high. The Board therefore finds the Life Extension alternative unacceptable.

Having found that both the Status Quo and Life Extension alternatives are not feasible alternatives, the Board finds, as outlined in Section 3.4, there exists a need on the system for both replacement capacity (MW) beginning in 2015 and additional capacity (MW) as soon as 2017 or 2018, depending on actual load development.

The Board also finds that the WD1 and WD2 units should be retired from service and salvaged once replacement capacity provided by one of the other alternatives is installed and operating satisfactorily.

#### **4.6 Renewable Resources**

YEC stated that no renewable resource alternatives have been identified within the relevant time period. YEC added that potentially available near-term hydro enhancement projects would not materially affect grid requirements for new generation capacity in 2015 and subsequent years. The Mayo Lake Enhanced Storage project would not add any new firm winter capacity to the system, while the Marsh Lake Storage project might potentially add 1 MW of firm winter capacity to the system. Additionally, these projects, although subject to potential drought conditions, would increase the volume of usable water storage for energy generation which could help to reduce the risk of higher thermal generation in drought conditions.

YEC noted that those same projects each had a relatively small energy supply impact — 4 GW.h/year (Mayo Lake) and 6 GW.h/year (Marsh Lake) (LTA) when compared to the forecast LTA diesel generation requirements. Those diesel requirements start at 17 GW.h/year in 2015 and increase to 41 GW.h/year by 2020. YEC argued that, while these projects would mitigate the need for diesel or gas at the margin, they would not allow YEC to get away from the incremental diesel required to meet the needs of the system over the next several years.<sup>119</sup>

YEC stated that each of these two projects is still at the environmental and planning assessment stage, prior to any filings with YESAB. YEC estimated that the earliest feasible date for either project to come into service is likely 2016 but that timing will be determined by the regulatory review stage requirements. YEC did note that these two projects are likely feasible today at current grid loads.

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<sup>119</sup> Transcript, March 31, 2014, page 124 to 125.

YEC said that it had looked at the possibility of biomass since it might fit in with the issues of capacity and backup because it could be dispatchable, but had concluded it was too expensive and was taken off the list of alternatives for this project.

YEC stated that in the present case it was in need of new dispatchable and flexible capacity to provide backup in case of an emergency, to provide capacity and energy during periods where the hydro system could not supply sufficient energy, such as during dry periods or sustained droughts, and finally to bridge the gap where load increases were too small to justify building high-priced assets, such as long-term hydro, early enough to bridge that gap.<sup>120</sup> That was why it was proposing the Project or the New Diesel alternative instead of a renewable project.

In discussing renewable alternatives, YEC stated that basically it was a matter of getting the right project at the right time at the right cost. It stated that energy is very different than capacity. If the long-term load was there, YEC had projects that it could implement such as long-term hydro, wind and maybe solar. In order to justify proceeding with such projects, it had to have sufficient load to cover the costs of such projects.

In terms of future development of renewables, YEC said it was continuing to pursue a 20 MW wind farm at Techo (Ferry Hill) in the Stewart Crossing area, but its wind-monitoring program was not yet complete. YEC also stated that the lead time for such a project would be three years after adequate wind monitoring.

In terms of future greenfield hydro developments, YEC said it was committed to continuing to pursue such developments for purposes of energy supply and was prepared to develop them when higher long-term loads justified such capital-intensive developments. YEC estimated that the lead time for such a development would be seven or more years.

YEC noted that the Overview of its 2011 Resource Plan provided summary details on each renewable option with the potential to be developed within a period of less than five years. As well, YEC had included an extensive list of available hydro sites that might be a longer-term renewable resource option to default diesel.

YEC also said that both before and after such future new renewable energy developments, thermal generation will continue to provide reliable supply on the Yukon grid during the periods between successive renewable developments.

Respecting DSM as a way to offset the need for capacity, YEC stated that it has considered DSM and was awaiting a decision from the Board respecting the joint YEC-YECL DSM plan presented at the most recent YECL GRA. YEC stated that the DSM savings that could be had would help, but still not be sufficient to offset the requirement for replacement capacity.<sup>121</sup>

YEC had built both energy and capacity savings into its forecast in Appendix C of the Application. In doing so, it had given equal weight to both capacity and energy savings, while the DSM program that had been proposed to the Board gave greater weight to

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<sup>120</sup> Transcript, March 31, 2014, page 43 to -45.

<sup>121</sup> Transcript, April 1, 2014, page 274 to 278.

energy savings.<sup>122</sup> Therefore, the capacity and energy forecast it had used in Appendix C probably overstated slightly the capacity savings that might be achieved by DSM, at least initially.

The energy savings it attributed to DSM after five years was expected to be in the order of 5 GW.h/y, which would be about one percent of the total annual load on a comparable basis. This meant a one-percent reduction in capacity demand, which was not significant in terms of reducing the need for replacement capacity. YEC also pointed out that its forecast assumed no DSM before 2015 and it took until 2017 before the DSM program was assumed to be fully effective.

YEC responded to questioning by YES/LE on the project referred to by YCS/LE as Surprise Lake Hydroelectric project in the Atlin Lake area.<sup>123</sup> The purpose of the project was to build a transmission connection to the Taku-River-Tlinglit-owned Pine Creek hydro station, near Atlin, British Columbia to take advantage of under-utilized existing capacity plus underdeveloped capability at the generating station. It was suggested that this project offered potential options of 10 GW.h/year, 23 GW.h/year and 52 GW.h/year in energy developments. These developments would have capacities of 1.5 MW, 3.5 MW and 8.0 MW respectively.

YEC stated that it had discussions with the Taku River Tlinglit some time ago in terms of such a project providing energy to YEC's system via a transmission connection. However, as far as YEC was aware the Taku River Tlinglit had applied, but not received, further funding for the project and the project had not advanced any farther. YEC stated that, as far as it was concerned, the driving factor to make such a project viable was the energy benefits it could provide, and while there might be capacity benefits, they were not the driving concern in a renewable project. YEC referenced the Mayo B project as an example of such a project. YEC also noted that, besides the fact that no one was bringing this project forward, the development of a generation and transmission project of this size in British Columbia would take a fair amount of time and was outside the scope of the timeframe in question. In reply argument, YEC reiterated its commitment to put renewables on the grid when the load is available and where there was an opportunity.<sup>124</sup> YEC cited its record in making renewables available to its customers either through generation projects or transmission projects that brought renewable energy to customers who did not have access to that energy. YEC noted the Mayo-Dawson Transmission Project that took Dawson off diesel and the Carmacks-Stewart Transmission Project that took Minto off diesel. Regarding hydro-generation projects, YEC referred to the Mayo B and Aishihik No. 3 projects that it had initiated and completed.

YEC pointed out that it had invested well in excess of \$250 million in renewable-type projects in the last few years. YEC argued that simply because YEC would like to have a cheaper, cleaner thermal backup system needed in a hydro-based system does not suggest that YEC is changing its commitment to renewables.

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<sup>122</sup> Transcript, March 31, 2014, page 48 to 50.

<sup>123</sup> Transcript, April 1, 2014, page 222 to 227.

<sup>124</sup> YEC Reply Argument, Transcript, April 2, 2014, page 554 to 556.

#### 4.6.1 Views of the Interveners

UCG was critical of YEC for not considering other alternatives to the LNG or New Diesel projects more fully. UCG raised the issue of DSM and stated that there was very little on the table to indicate that YEC was trying to reduce not only existing demand but also incremental demand due to growing load. UCG stated that, from the evidence, the likely results from the DSM program over the next four years were not good enough in terms of avoiding additional load growth.<sup>125</sup> UCG wanted to see more of a commitment to renewables. UCG also pointed out that YEC's main reason for rejecting renewable projects was the high initial capital cost. However, in the case of LNG versus New Diesel, YEC had opted for the higher capital cost project, citing lower operating costs as the main benefit, while at the same time rejecting renewables such as hydro which provide the same lower-cost operating benefits. UCG argued that YEC statements regarding renewables were inconsistent with its statements regarding the LNG Project.<sup>126</sup>

YCS/LE was critical of YEC for not further developing its DSM program with a view to targeting reduction of demand and demand shifting given its need to install replacement and new capacity to meet that demand. YCS/LE stated that YEC should have priced out the cost of such programs and included them as alternatives given that they address the same problem that YEC is trying to address the need for capacity to meet demand.<sup>127</sup>

YCS/LE argued that renewable projects such as hydro projects can provide capacity as well as energy, citing the Aishihik hydro project as one such example providing reliable capacity and energy, although subject to transmission outages.<sup>128</sup> YCS/LE argued that the Surprise Lake Hydro development was another example of a potentially credible project that could yield up to 52 GW.h/year in energy and 8 MW in capacity, which could meet both YEC's need for replacement capacity and provide renewable energy. YCS/LE noted that the third Aishihik unit was put in for capacity reasons and was expected to pay for itself. YCS/LE contended that the Surprise Lake development should have been pursued further by YEC as a renewable alternative to the LNG Project and might fit in well with future system development.<sup>129</sup> In conclusion, YCS/LE argued that unless an alternative to the LNG Project was within YEC's domain<sup>130</sup> it wasn't even considered and even those alternatives that YEC cited had not been adequately costed out and carefully considered.

Mr. Roberts questioned why Surprise Lake hydro was not pursued by YEC as strongly as the LNG Project,<sup>131</sup> and why the results of the Mt. Sumanik studies were not shared by YEC.<sup>132</sup> He argued that option after option had been discounted without fully engaging with Yukon ratepayers.<sup>133</sup> Mr. Roberts was critical of YEC for not adequately exploring alternatives to the LNG project, such as a Smart Grid, DSM and developing and integrating more wind and hydro power into the system in the Yukon.<sup>134</sup> He argued

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<sup>125</sup> UCG Argument, Transcript, April 2, 2014, page 480 to 482.

<sup>126</sup> UCG Argument, Transcript, April 2, 2014, page 481 to 482.

<sup>127</sup> YCS/LE Argument, Transcript, April 2, 2014, page 506 to 508.

<sup>128</sup> YCS/LE Argument, Transcript, April 2, 2014, page 492.

<sup>129</sup> YEC/LE Argument, Transcript, April 2, 2014, page 509 to 510.

<sup>130</sup> Transcript, April 2, 2014, page 510 to 511.

<sup>131</sup> Roberts Argument, Transcript, April 2, 2014, page 525.

<sup>132</sup> Roberts Argument, Transcript, April 2, 2014, page 526.

<sup>133</sup> Roberts Argument, Transcript, April 2, 2014, page 526.

<sup>134</sup> Roberts Argument, Transcript, April 2, 2014, page 535.

that YEC seemed to be stacking the deck with all the negatives about going to alternatives.<sup>135</sup> In conclusion, Mr. Roberts urged that the funds that were to be spent on the LNG Project should be invested in renewables, allowing smaller scale projects to be built.

#### **4.6.2 Views of the Board on Renewable Alternatives**

The Board has reviewed the evidence and testimony of YEC and the arguments of all the parties. The Board's view is that there are no viable renewable alternatives that could be developed within the very short timeframe available, given the need for replacement capacity by 2015, absent the retention of WD1 and WD2 (the Status Quo alternative) for a very short period of time until alternative replacement capacity could be put in place. Even then, the Board is of the view that none of the renewable alternatives cited by YEC and the interveners would be adequate to fulfill that replacement role, either because of timing issues or size of the alternative when compared to the need.

In the case of DSM, the Board notes that a DSM program is not yet in place and, when implemented, is forecast by YEC not to develop fully until 2017 at the earliest. Additionally, given YEC's forecast, the program is unlikely to have a significant effect on the need for capacity, especially replacement capacity in 2015, within the 2015 to 2018 timeframe.<sup>136</sup>

In the case of Surprise Lake, the Board notes from YEC's testimony that there are currently no discussions ongoing between the Taku River Tlinglit and YEC. The Board also notes that, irrespective of the potential merits of such a hydro development, the timing of such a development in an adjoining province, and transmission line from BC are likely to be well outside the timeframe required for the consideration of an alternative, given the need within the 2015 to 2018 timeframe for capacity.

With respect to wind development, the Board notes that YEC has not yet concluded its wind studies at the Techo site and, subsequent to that, a further three years would be required before such a project could be in place. This places this project outside the timeframe of the need addressed by the LNG Project.

The Board notes that two potentially viable near-term hydro enhancement projects exist: Mayo Lake Enhanced Storage and the Marsh Lake Storage. The Board also notes that those projects might be able to be in service as early as 2016. However, the amount of capacity and quantities of energy available from both projects would be insufficient to meet the need for new capacity — 1 MW versus 8.5 MW in 2016 — and would affect energy supply on the margin at 10 GW.h/year total. The Board concludes that, while these projects may have their merits and may well go forward in the near term, they are insufficient to supplant the LNG Project.

For the above reasons, the Board finds that there are no viable renewable alternatives available either due to magnitude or timing constraints to meet the need for replacement capacity and new capacity.

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<sup>135</sup> Roberts Argument, Transcript, April 2, 2014, page 530.

<sup>136</sup> Transcript, March 31, 2014, page 58 and 59.

## 4.7 New Diesel Alternative

### 4.7.1 Views of YEC

YEC stated that, after looking at the relevant costs and risks, it had concluded that the only practical and cost-effective alternative to the project was the replacement of the WD1 and WD2 Mirrlees units with new higher-efficiency diesel replacements.

In the Application, YEC stated that the New Diesel alternative assumed two new 6.7 MW diesel (13.4 MW) with higher fuel efficiency (40 percent) would be installed in the WD1 and WD2 service bays, with the first unit installed in late 2014, at an estimated capital cost of \$22.5 million, and the second unit in late 2015 at a capital cost of \$11.0 million. YEC added that it ascertained that the earliest the first unit could physically be installed was now late 2015.<sup>137</sup> YEC further stated that such an option would provide the following benefits:

- the ability to meet grid capacity shortfall requirements through to 2018 for reliable grid electricity supply under Base Case forecasts without the need for the added costs of or selection of another location for additional new capacity needed by 2016 such as would be the case under the WD1 and WD2 life extension option.
- the ability to use more efficient diesel generation units to meet a substantive share of ongoing forecast grid default diesel generation requirements, assuming LTA hydro generation.

YEC estimated that the use of more efficient diesel units to meet much of the ongoing need for diesel generation on the grid would result in significant savings to ratepayers. YEC estimated that with one unit in place in 2015, 90 percent of LTA diesel could be met, increasing to 100 percent in 2016 with the second diesel unit (see Table 3). Given that replacement of existing diesel, YEC estimated that resulting annual fuel savings would be worth \$0.6 million in 2015 and \$0.9 million by 2016.

However, YEC noted that utilizing the existing Mirrlees unit bays for these new units creates scheduling risks. There is a need to retain each existing Mirrlees unit in service until at least March and then remove that unit and install the new one prior to December of the same year.

YEC stated that, in developing this alternative, it had concentrated on units that would effectively utilize the existing Mirrlees bays. This led to YEC selecting larger units (6.7MW Wartsila units) than were selected for the Project (4.4 MW GE units), with no such constraints,<sup>138</sup> or that would have been selected if it were considering replacing the existing Electro-motive Diesel units in their smaller bays.

In its IR responses, YEC amended its New Diesel alternative by stating that if it were to proceed to actually install the two Wartsila units it would likely install them both at once in the same construction season in a one-stage rather than a two-stage approach to the project in order to secure cost efficiencies.<sup>139</sup> YEC further amended its alternative by

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<sup>137</sup> Application, page 26, footnote 36.

<sup>138</sup> Transcript, April 1, 2014, page 417 to 418.

<sup>139</sup> YUB-YEC 13(a).

stating that it had removed from its cost estimates \$800,000 in planning costs specific to LNG supply and transportation which were not directly related to the new diesel installation, as well as a reduction in the removal costs for WD1 and WD2. YEC estimated the amended cost of the New Diesel alternative would be \$32.7 million rather than the previous \$33.5 million.

The two Wartsila units chosen would have an expected efficiency of 40 percent (4.28 kW.h/l), with diesel fuel prices at \$1.0513/l. The fuel cost of the energy they would provide, YEC estimated to be 24.56 cents per kW.h. YEC stated that it chose the Wartsilla units for diesel comparative purposes because it had already considered them as part of a dual-fuel development at the Whitehorse Plant to replace the Mirrlees units and as a transition to LNG, and therefore, had the best and most up-to-date cost and physical information on those units.<sup>140 141</sup> YEC said its investigations had not revealed a viable modular diesel engine option that could be located outside the current diesel plant that was suited to YEC's needs — i.e. the specific modular option available for LNG is not available for diesel and other available diesel options were too small for YEC's needs. YEC stated that it had specifically chosen the two Wartsila units because they were the best combined physical fit into the existing Mirrlees bays which optimized the use of the existing space while providing sufficient electrical capacity to meet the need projected to 2018.

YEC was questioned as to why, as a diesel replacement alternative, it did not cost out utilizing two or three Cat 3616 diesel units to replace the Mirrlees units and, if necessary, construct a pre-engineered building for the third unit on the project site, or at the Mayo road substation or the Faro diesel plant. YEC responded that the use of such engines would not have met the reserve capacity requirement utilizing just the two Mirrlees bays. Two such engines would have given a capacity of not more than 10 MW which would have been insufficient to meet the need projected to 2018 (13.0 MW). YEC stated that it expected that on a per-MW basis the capital cost would be the same as the Wartsilla units for the same capacity. The use of two Cat 3616 units would not have resulted in any significant decrease in balance of plant costs.

Finally, YEC stated that it had not examined installing new diesel at another location outside the Mirrlees bays. Therefore, it could not provide capital cost estimates for a third unit located in a modular plant at another location. YEC added that it had not considered using a wide range of other diesel-only alternatives as there would be no additional fuel savings under that approach, as compared to the Wartsilla units, and overall there were benefits to retaining additional thermal generation at the WTGS.<sup>142</sup>

Responding to questioning as to why it did not consider the use of second-hand diesels as an alternative to new diesels, YEC said that buying really old engines that would require no change-out of the existing plant systems serving WD1 and WD2 and then refurbishing these units, would be costly and bad value for money as their expected life would be short, just as for the Mirrlees units.<sup>143</sup> As well, the old engines suffer from the same problems as the Mirrlees units, parts aren't made anymore or are difficult to get, and the old engines break down. Buying newer used engines would incur significant

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<sup>140</sup> Transcript, March 31, 2014, page 64 to 67.

<sup>141</sup> Transcript, April 1, 2014, page 390 to 394.

<sup>142</sup> Transcript, April 1, 2014, page 359 to 361.

<sup>143</sup> Transcript, March 31, 2014, page 53 to 55.

additional costs related to Balance of Plant work to replace and update the systems that serve these units. Additionally, they don't provide a long-term solution to the need for reliable and flexible capacity because these engines will age and have the same issues YEC is dealing with in the Mirrlees units. YEC did not consider refurbishing and utilizing second-hand diesel engines a cost-effective or viable alternative to installing new diesel units and had not considered doing so as part of the Application.

YEC was questioned about the use of customers' diesels during outages as at least a partial diesel alternative that would reduce in some part the need for new or additional capacity.<sup>144</sup> <sup>145</sup> YEC replied first by stating that, in evaluating the need for new capacity under the N-1 capacity planning criteria, it was assumed that service to all non-industrial loads would have been cut off prior to a determination of need (see Tables 1 and 2). Thus the need for new capacity (replacement and additional) during system emergencies omitted any consideration of industrial requirements for capacity during those emergencies. YEC added that there was only one mine that could provide its own backup power, the Minto mine. YEC stated that it believed the mine had 4.5 MW (3 x 1.5 MW) of backup capacity available to it when it first went into service. YEC also stated that it understood that those generators may still be in place to allow a controlled shutdown of their mill production and possibly to allow the mill to operate at a reduced throughput. When asked if the Minto mine might be willing to shut down and supply the grid system with capacity during peak or during a N-1 system emergency, YEC replied that in its experience industrial customers install backup capacity to be able to operate and meet their own requirements during emergencies and weren't interested in supplying the system during such events. In any event, YEC stated that it didn't believe that the units in question were sufficiently reliable to meet YEC's requirements, and being on the grid, if the grid failed, they would not be available during an emergency.<sup>146</sup> YEC had dealt with that issue previously when it tried to work out a deal with Capstone regarding the units. It believed that given today's circumstances, neither Capstone nor YEC were in the least bit interested in such a deal and YEC didn't wish to revisit those previous efforts.

In conclusion, YEC submitted that the New Diesel alternative's capital costs were essentially the same as the Project's costs insofar as the generating units themselves were concerned. The main difference between the capital costs of the Project and New Diesel alternative was the cost to establish new facilities for LNG truck unloading, storage and vapourization. In addition, the New Diesel alternative yielded operating fuel cost savings as compared to the use of existing diesel units to supply the system's diesel energy requirements. YEC recommended its New Diesel alternative, utilizing the Wartsila units, to the Board, as the most economic and practical diesel alternative for comparative purposes.

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<sup>144</sup> Transcript, March 31, 2014, page 138 to 140.

<sup>145</sup> Transcript, March 31, 2014, page 158 to 164.

<sup>146</sup> Transcript, March 31, 2014, page 47 - discussion also applies to mine diesels.

#### 4.7.2 Views of the interveners

UCG argued that the entire case for the Project was not driven by fuel cost savings but on the need for capacity. UCG noted that YEC had stated that the New Diesel alternative met that same need for capacity but with less fuel cost savings as compared to LNG. UCG pointed out that the New Diesel alternative became more attractive if the Board was not satisfied that the Project would not produce and pass on enormous savings in fuel costs.<sup>147</sup>

Respecting other diesel options, UCG argued that such options as second-hand diesels were rejected out of hand by YEC, possibly because of YEC's experience with its Mirrlees units. UCG contended that it expected YEC to have given more consideration to the second-hand diesels as an alternative to new capacity.<sup>148</sup>

YCS/LE argued that there were two sorts of alternatives: the ones YEC has considered, such as the New Diesel alternative, and the ones that YEC had not and was not prepared to consider and price out.<sup>149 150</sup> YCS/LE cited approaching industrial customers regarding the use of mine diesels as one such example. YCS/LE argued that YEC should have followed up on the possibility of developing such a deal under current circumstances rather than relying on its past experiences in discounting the possibilities.<sup>151</sup> YCS/LE submitted that YEC should have gone out to the market and priced out other alternatives.<sup>152</sup> YCS/LE concluded that YEC, having failed to follow up and price out the costs of alternatives such as mine diesels and others, left the Board with only one alternative to consider — the New Diesel alternative, a project that was entirely within the confines and control of YEC.<sup>153</sup>

Mr. Roberts stated that it did not appear that YEC had a solid plan to switch from diesel to LNG.<sup>154</sup> He pointed out that with a diesel alternative, at least there was security of supply — something that did not appear to exist with the project.<sup>155</sup> Therefore, he was opposed to the switch from diesel to LNG, although he had a strong preference for renewable alternatives.<sup>156</sup>

#### 4.7.3 Views of the Board on Diesel Alternatives

The Board notes that, except for WD1 and WD2, YEC included all utility-owned diesel-generating units connected to the grid in its evaluation of the need for new capacity under the N-1 capacity criteria (see Tables 1 and 2), including 5.48 MW of capacity from YECL's diesel units.<sup>157 158</sup>

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<sup>147</sup> UCG Argument, Transcript, April 2, 2014, page 486.

<sup>148</sup> UCG Argument, Transcript, April 2, 2104, page 482.

<sup>149</sup> YCS/LE Argument, Transcript, April 2, 2014, page 506.

<sup>150</sup> YCS/LE Argument, Transcript, April 2, 2014, page 510.

<sup>151</sup> YCS/LE Argument, Transcript, April 2, 2014, page 511.

<sup>152</sup> YCS/LE Argument, Transcript, April 2, 2014, page 511.

<sup>153</sup> YCS/LE Argument, Transcript, April 2, 2014, page 511.

<sup>154</sup> Roberts Argument, Transcript, April 2, 2104, page 524.

<sup>155</sup> Roberts Argument, Transcript, April 2, 2014, page 532.

<sup>156</sup> Roberts Argument, Transcript, April 2, 2014, page 536.

<sup>157</sup> YECL's Fish Creek Hydro unit (0.40 MW) and Haines Junction diesel unit (1.75MW), which is affected by the loss of the Aishihik transmission line, were omitted from YEC's N-1 capacity criteria calculations.

<sup>158</sup> Transcript, April 1, 2014, page 419 to 420.

The Board considered YEC's statement that it chose the Wartsilla units as the New Diesel alternative for comparative purposes because it had already considered them as part of a dual-fuel development at the Whitehorse plant to replace the Mirrlees units and as a transition to LNG. Therefore, it had the best and most up-to-date cost and physical information on those units.<sup>159 160</sup>

The Board took note of YEC's statement that it had not considered using a wide range of other diesel only alternatives because there would be no additional fuel savings under that approach when compared to the Wartsilla units. Also, overall there were benefits to retaining additional thermal generation at the Whitehorse generating plant.

The Board has reviewed the evidence and testimony of YEC, its argument and that of the interveners regarding the use of second-hand generating units as a diesel alternative. From YEC's evidence, the Board considers that second-hand units would likely incur refurbishment costs, might incur additional balance of plant work costs, offer a shorter service life and were unlikely to provide additional fuel cost savings when compared to existing or new diesel units. The Board concludes that second-hand generating units are not a feasible alternative to a New Diesel alternative.

With regard to the use of mine diesels during emergencies, the Board notes the diesels units cited had a total capacity of about 4.5 MW, which would meet only about one-half the need in the first year, 2015, let alone the need projected to 2018. Even if such a proposition were feasible, it still requires additional diesel capacity to be provided by some other means, presumably another diesel development like the one cited by YEC. The Board accepts YEC's statements that, in its experience, industrial customers were unlikely to interrupt their operations to provide capacity to the system during an emergency, and therefore, were unlikely to enter into a contract for such an arrangement. The Board concludes that the availability of mine diesels during system emergencies is unlikely, and if available, would not obviate the need for further new diesel capacity and might not meet the N-1 reliability criteria set forth by the Board. Consequently, the Board is of the view that the use of mine diesels is not a feasible diesel alternative.

The Board regards the diesel alternative cited by YCS/LE of utilizing three Cat 3616 diesels (3x5 MW) in lieu of the Wartsila diesels as having the most promise of the alternatives cited by the interveners. However, the Board notes that no evidence was provided by YCS/LE and the alternative remains essentially untested. The Board notes, however, YEC's statements that such a development appears not to offer any capital cost or fuel operating cost advantages over the Wartsila units. Consequently, in the absence of sufficient evidence, the Board is not able to assign any weight to this development in its considerations.

Of the diesel alternatives cited by the parties, the Board is prepared to give the most weight to YEC's Wartsilla New Diesel alternative. This view is based on YEC's evidence that this is the diesel alternative that YEC would be most likely to proceed with if it were to proceed with a diesel alternative at this time. YEC had previously considered installing these units in the context of a transition to LNG. Consequently, YEC had made

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<sup>159</sup> Transcript, March 31, 2014, page 20.

<sup>160</sup> Transcript, April 1, 2014, page 390 to 394.

the prerequisite amount of effort necessary in evaluating the requirements and costs of such an installation and incorporated that information into its Application, making it a viable alternative to the LNG Project.<sup>161</sup> Therefore, the Board finds that the Wartsilla New Diesel alternative is a viable diesel alternative suited to comparison with YEC's LNG Project.

## **5 PRUDENCE OF PROCEEDING WITH THE LNG PROJECT AT THIS TIME**

With respect to the Terms of Reference, the Minister requested that the Board investigate whether it is prudent to build the Whitehorse Diesel to Natural Gas Conversion Project at this time. In this section, the Board considers the prudence of proceeding with the project.

### **5.1 Views of YEC**

YEC submitted that, based on the evidence, the project was robust.

...[the project] continues to provide ratepayer cost savings when we attempt or Yukon Energy increases the capital costs by more than 10 to 15 percent or when they decrease the projected fuel cost savings by, say, 4 to 5 cents a kilowatt hour.<sup>162</sup>

YEC further submitted that the Project's feasibility and economics have been tested under a wide range of conditions and the Project has demonstrable savings for ratepayers in the near term that more than pay off the cost difference compared to the New Diesel alternative.

The projected ratepayer's fuel cost savings in the project over ... the four initial years approximate, ... 11.9 million using the conservative base load forecast with no Alexco load...

Projected fuel cost savings of 11.9 million in the first four years are in excess of 9.3 million additional capital costs assumed for the project compared to new diesel.<sup>163</sup>

In addition to the above, YEC stated that the updated fuel cost savings per kilowatt hour have not been materially impacted by the change in the LNG supply to the existing plant at Tilbury. YEC added that the project also contains a conservative gas price of \$4.50 for MMBtu — conservative, considering that the gas price averaged \$3.70 over the last six months.<sup>164</sup>

Absent the project, YEC pointed out that it would need to install equivalent new diesel generation capacity at the Whitehorse diesel plant. YEC reiterated that the record shows the robustness of the project's near-term ratepayers' savings economics, given a number of sensitivity tests regarding capital cost changes and fuel cost changes.

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<sup>161</sup> Application, page 26, footnote 35.

<sup>162</sup> Transcript April 2, 2014, page 474, lines 3 to 7.

<sup>163</sup> Transcript April 2, 2014, page 475, lines 7 to 10 and lines 16 to 18.

<sup>164</sup> Transcript, April 2, 2014, page 474, lines 21 to 25.

Regarding the material savings that were expected to accrue to ratepayers over the project's economic life, YEC submitted:

[the] first four-years ... total savings are expected to be sufficient to fully recover any added capital cost compared to new diesel generation that otherwise would be required today...<sup>165</sup>

Moreover, ratepayer fuel cost savings are expected to continue throughout the 40-year economic life of the project.

## 5.2 Views of the interveners

UCG submitted that the Project was not supported by the evidence. It added that the evidence did not demonstrate that the Project should be chosen over the diesel option. Moreover, UCG suggested that the Board should direct that, accompanying any further increases in capacity above the replacement of the engines, YEC should provide evidence that it has attempted to reduce load and thus reduce the need for capacity in the long term. In conclusion, UCG stated that the diesel option, which was acknowledged by YEC as a potential option, was a prudent option for the Board to recommend to the Minister. UCG further submitted that its recommended course of action accords with the public interest in the long run, which may be a factor in the Board's consideration.<sup>166</sup>

Respecting the issue of prudence, YCS/LE pointed out that the basis for the Project was a four-year business case and questioned the lack of an analysis of the long-term risks that the Project might face. YCS/LE acknowledged the four-year business case showed that the potential savings, as presented in the Application, might recover the Project's added capital costs compared to new diesel generation; however, YCS/LE pointed out the lack of evidence respecting the payback of total project costs over the life of the project. YCS/LE also questioned the lack of alternatives on the record against which the Project could be compared:

...if you've only got one alternative, that means how and why did you dismiss all the other ones?<sup>167</sup>

YCS/LE suggested that the four-year business case did not match the standard of prudence as defined by a normal dictionary. YCS/LE further suggested that the financial analysis might have considered the impact of carbon pricing. Noting the comments arising from the proceeding's community session, YCS/LE concluded by stating that albeit the financial analysis may support the project, if there was not a lot of public support for the project, it should not move forward.<sup>168</sup>

Mr. Roberts recommended that the Board advise the government that the evidence and the information were not available to make the decision to move forward with the project.

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<sup>165</sup> Transcript, April 2, 2014, page 476, lines 13 to 16.

<sup>166</sup> Transcript, April 2, 2014, page 486, line 14 to page 489, line 7.

<sup>167</sup> Transcript, April 2, 2014, page 516, lines 21 to 23.

<sup>168</sup> Transcript, April 2, 2014, page 514, line 24 to page 520, line 20.

### 5.3 Views of the Board

The Board took note of YEC's submission that the replacement of WD1 and WD2 could not be delayed and the only alternative option is new diesel. Moreover, the Board acknowledges YEC's submission that based on the EIA and NEB forecasts, the resultant significant fuel cost savings over the next four years will offset all of the additional capital costs incurred for the LNG option as compared to the diesel option. The Board, being cognisant of forecast risks going forward, considers that no other forecast was put on record — only interveners' concerns regarding the LNG price risk going forward and these are discussed in previous sections to this report.

## 6 RECOMMENDATION OF THE BOARD

Although the New Diesel alternative is a feasible alternative, based on the above findings, the Board recommends that the Minister approve the Project because there is a public need, and the Project would allow YEC to install new capacity. The Board is also satisfied by the evidence that the Project, when compared to new diesel would result in savings to customers of \$700,000 in 2016, increasing to \$2.1 million by 2018, and thus would not negatively impact rates. This was not refuted by the interveners.

The Board also considers of note YEC's submission respecting the forecast spread between LNG and diesel fuel prices that "there was really nothing on the evidence ... that dealt with the short-term, the four or five years we're talking about."<sup>169</sup> The Board accepts that there is nothing on the record that disputes YEC's evidence, albeit interveners voiced concerns regarding the LNG and diesel fuel cost spread. The Board is of the opinion that the public benefit of the Project is significant.

For the reasons set out above, the Board is not recommending any conditions to the Project.

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<sup>169</sup> Transcript, April 2, 2014, page 548, lines 3 to 5.

**TERMS OF REFERENCE**

**IN THE MATTER OF the *Public Utilities Act*  
and  
IN THE MATTER OF an Application by Yukon Energy Corporation for an  
Energy Project Certificate and an Energy Operation Certificate regarding the  
Proposed Whitehorse Diesel – Natural Gas Conversion Project**

**Background**

**A.** On April 27, 2012 Yukon Energy Corporation (YEC) filed with the Yukon Utilities Board (YUB) an update to its 20-year Resource Plan: 2006-2025 as an Interrogatory Response (IR) to questions posed by interveners during the review of its 2012-2013 General Rate Application. In this document it outlined the option of thermal generation using Liquefied Natural Gas (LNG) for near-term development (i.e. up to 2015).

**B.** YEC wishes to begin construction on the project during the 2014 season.

**C.** The Whitehorse Diesel - Natural Gas Conversion Project is a project to modernize the existing Yukon Energy Corporation Whitehorse Thermal Generating Station to meet growing requirements for reliable and flexible thermal generation on the Yukon grid including the replacement of two diesel generating units (9.1 MW total capacity) scheduled for retirement by 2015 with up to three new modular natural gas-fired generating units (13.1 MW total capacity) supplied by liquefied natural gas (LNG), and the installation of LNG truck offloading, storage, vapourization, and related infrastructure.

**D.** A proposal for the Whitehorse Diesel-Natural Gas Conversion Project was submitted in November 2013 to the Yukon Environmental and Socio-economic Assessment Board (YESAB) under the *Yukon Environmental and Socio-economic Assessment Act* (Canada), and is subject to a screening by the Executive Committee of YESAB. This process will lead to a recommendation by the Executive Committee, and a response by the Yukon government and other decision bodies in the form of a “decision document”. Any government authorizations issued in support of the Whitehorse Diesel-Natural Gas Conversion Project, including any Energy Project Certificate or Energy Operation Certificate under Part 3 of the *Public Utilities Act*, will have to conform to the decision document of the Yukon government.

**E.** The Whitehorse Diesel-Natural Gas Conversion Project has been designated, in OIC 2013/200 as a Regulated Project under Part 3 of the *Public Utilities Act* pursuant to section 36 of that Act.

F. On December 9, 2013 YEC applied under Part 3 of the *Public Utilities Act* for an energy project certificate and an energy operation certificate regarding the Whitehorse Diesel-Natural Gas Conversion Project.

**THEREFORE**, as required by Part 3 of the *Public Utilities Act*, the YEC application for an Energy Project Certificate and an Energy Operation Certificate is hereby referred to the YUB for a review and hearing as follows:

**General purpose of review and hearing**

1. The general purpose of the review and hearing is to obtain the YUB's report and recommendations on the potential benefits, costs, risks and customer impacts that influence whether the Whitehorse Diesel-Natural Gas Conversion Project should proceed as proposed by YEC, and any terms and conditions which the YUB considers should apply.

**Public hearing**

2. The YUB shall hold a public hearing, as required, in a format to be determined by the YUB and it shall receive submissions from any person or groups or classes of persons who, in the opinion of the YUB, have an interest in the matter.

**Specific aspects of the project to be reviewed**

3. The YUB shall report on and make recommendations about the necessity for the Whitehorse Diesel-Natural Gas Conversion Project and its timing and design, with particular regard to:
  - a. The public need for the Whitehorse Diesel-Natural Gas Conversion Project under various reasonable electric load forecasts, including near term requirements related to industrial and non-industrial loads, and the effect of the project on the rates of customers;
  - b. The capability of existing and currently committed generation and transmission facilities including thermal generation facilities to provide reliable electric power generation to meet the forecast load requirements and YEC's capacity planning criteria, and the effect of the Whitehorse Diesel-Natural Gas Conversion Project on this capability.
  - c. The risks facing the Whitehorse Diesel-Natural Gas Conversion Project and their potential impacts on rates for customers

- d. What, if any, alternatives to the Whitehorse Diesel-Natural Gas Conversion Project might be advisable given reasonable load assumptions and risk assessments.
- e. Whether it is prudent to build the Whitehorse Diesel-Natural Gas Conversion Project at this time.

**Timing of report and recommendations**

- 4. The YUB shall submit its report and recommendations to the Minister of Justice no later than April 15, 2014.

**Recommendation respecting certificates**

- 5. The YUB shall provide a recommendation on whether YEC should be granted an energy project certificate and an energy operation certificate for the Whitehorse Diesel-Natural Gas Conversion Project and any applicable terms and conditions.

**Other Recommendations**

- 6. The YUB may make any other recommendations or provide any other information that it considers advisable in the circumstances.

Issued by Honourable Mike Nixon  
Minister of Justice  
Attorney General

December 18, 2013