YUKON UTILITIES BOARD

YEC BATTERY ENERGY STORAGE SYSTEM (BESS) PROJECT

P R O C E E D I N G S

Volume 1

May 4, 2021

Held via videoconferencing

Whitehorse, Yukon

Proceedings taken at the Kwanlin Dün Cultural Centre, at 1171 Front Street, via videoconferencing at Whitehorse, Alberta.

Volume 1

May 4, 2021

Richard Buchan	Chair
Bonnie King	Vice-Chair
Andre Fortin	Board Member
Anne Middler	Board Member
Alison Sabo	Board Counsel
Jaimie Graham	Board Counsel
Deana Lemke	Board Staff
Dwayne Ward	Board Staff
Abhinav Ayri	Board Staff
P. John Landry, QC	For Yukon Energy Corporation
Christopher Cullingham	For ATCO Electric Yukon
Patrick McMahon	For Utilities Consumers'
Roger Rondeau	Group
Scott Pressnail	For Yukon Conservation Society
John Maissan	In his own stead
Donna Gerbrandt, CSR(A)	Official Court Reporters
Lorelee Vespa CSR(A) RPR CRR	

(PROCEEDINGS COMMENCED AT 9:01 A.M.)

THE CHAIR: Good morning. This begins the three-day hearing of the Yukon Energy Corporation's application under the *Public Utilities Act* in

connection with its proposed Battery Energy Storage Project.

I would like to begin by acknowledging that this hearing, and the project which it relates, is taking place on the shared traditional territories of the Kwanlin Dün First Nation and the Ta'an Kwach'an Council. We take a moment to reflect on and respect the care and stewardship of these lands by these First Nations members and their many generations of ancestors. 09:01

I also acknowledge that we are located in the Kwanlin Dün Cultural Centre, a beautiful facility on the shores of the Yukon River in Whitehorse.

I will begin by introducing the members of the Utilities Board Panel. My name is Rick Buchan, I am the Chair; to my left is Bonnie King, she is the Vice-Chair; and to her left is Andre Fortin, member; and to my right is Anne Middler, a member.

We are down one member due to one of our previous member's resigning in order to take up a 09:01 too-good-to-refuse career opportunity, and so there will be a panel of four.

I'm pleased to have the opportunity to work with this diverse and talented group. Each member of the Board brings to our task a unique combination of

talents, skills, experience, and perspectives.

I would also like to introduce the principal members of the invaluable team that supports the Board and enables it to function effectively. In that regard, I acknowledge Deana Lemke, who is the Board's executive secretary and has served very capably in that position for many years; and I would acknowledge as well our legal counsel, Alison Sabo and Jaimie Graham; as well as the regulatory technical advisors, Mr. Dwayne Ward and Abhinav Ayri; the court reporters are preparing transcripts of the hearing, that being Amicus Reporting; and our IT support for this new mode of conducting hearings is the firm of Upstream Events here in Whitehorse. 09:02

Before we get into the hearing itself, I would just like to draw your attention to a few courtesies and technical notes to remember during the hearing.

Please turn off or mute all the audible notifications on cellphones, tablets, computers, and other electronic devices. 09:03

As well, please remember that the court reporter needs to be able to clearly hear people in order to prepare an accurate transcript. So please try to speak slowly, clearly, and loudly enough for the court reporter to hear you. Also be mindful of not speaking

over another person. This can often inadvertently take place during cross-examination.

All hearing participants and observers, please switch off your video and your microphones to preserve bandwidth and, likewise, to avoid inadvertent background sounds from interrupting the proceedings. For those unfamiliar with the Zoom platform, the switches for the audio and video features are located on the bottom left corner of the screen.

09:04 Participants who are speaking or who may wish to raise an objection should turn on their video and request to be acknowledged by using the "raise hand" feature, which can be found under the "Reactions" button at the bottom margin of the Zoom screen. Once acknowledged by the Chair, you may speak.

If possible, participants are asked to use a headset with a microphone, as well as a web camera directly attached to your computer as this will result in better sound quality with less potential for

09:05 background noise and echoes. Please ensure that your volume settings on your microphone are adjusted appropriately.

Although we are not all meeting in a single location, as would be the case with hearings in a non-COVID year, we expect that some participants or

audience members may be meeting in other locations; and, in that case, we remind people of the public health orders that impose limits on the size of indoor gatherings and require that masking and social distancing be used to limit the spread of the COVID-19 virus.

The Board would also like to express appreciation for the participants' extraordinary efforts to move this matter forward in a timely way, despite a relatively short time frame and the challenging circumstances we've all be facing over the past 14 months due to the COVID-19 pandemic. You can appreciate scheduling the Board's first virtual hearing has not been easy, and we truly appreciate everyone's patience as we get oriented to this novel process. 09:06

The Board emphasizes that the health and safety of participants and the fairness of the hearing processes are of paramount importance, and with those principles in mind, we have tried to adapt our process and our approach accordingly. 09:07

So today is the start of the public hearing for the Yukon Energy Corporation, which I think we'll be referring to as "YEC" throughout for an Energy Project Certificate and an Energy Operation Certificate for the Battery Energy Storage System Project, and the acronym

for that is "BESS," which I think we will be likely referring to throughout the hearing.

We are scheduled for the next three days, but we're hoping that, with all going well, we can finish in less time, assuming no technological difficulties disrupt those plans.

The BESS Project and the related operation, Energy Operation Certificates, are subject to Part 3 of the Yukon's *Public Utilities Act* and they have been referred to the Board for you and the hearing in accordance with the terms of reference prescribed by the Minister of Justice in her letter to the Board of February 2, 2021. Following the close of the hearing and receipt of final written submissions, the Board will prepare and issue a report to the Minister with recommendations on the BESS Project, as requested in the terms of reference. 09:08

I just want to ask if any party or intervener has any challenges or objections relating to the Board's members serving on this Panel or the jurisdiction in order to conduct the hearing? 09:09

If anybody has any concern, please speak up.

All right, hearing none, we will -- sorry.

Okay. Very, very faintly. I'm sorry, we can...just hang on. We're getting the speaker issue

resolved. It's possible -- this is Mr. Rondeau? It's possible -- oh, there you are.

Okay, you know what, I would suggest, Mr. Rondeau, if you go down to the microphone icon in the bottom left corner, there's an arrow next to it.

MR. RONDEAU: Yes.

THE CHAIR: Okay. Click on the arrow and you should see a menu of options, and one of which would be to test the microphone and speakers. So if you click on the test menu item, it should pop up a box that allows you to test your speaker and your microphone. 09:11

We can't hear what you're saying. We can see you and we can see the fact that you are speaking, but if you -- if you alternate between -- if you've got multiple options for microphone, again, there would be a dropdown menu, try switching from one to another.

No. No, it's still very garbled. It doesn't -- do we have an option, an alternative? That would be to phone in, I think.

Yeah, Mr. Rondeau -- no, okay. What's our phone number, then? There is a cellphone option to be able to phone in; right? 09:13

Yeah, we can't hear you, Mr. Rondeau. Can you get access to your telephone? We're going to give you the number to call in by telephone, and that way at least

we'll get your audio via telephone.

We can't hear you, sorry. We're just waiting on the phone number that you can use to call in. Do you have a phone within reach?

The same problem as at the outset, it's very, very -- almost indecipherable. Yeah, call on the telephone.

Okay, we're just -- do you have the phone number on the Zoom invitation?

IT PERSON: There isn't a phone number on that invitation, it's just a phone number to register. I'm looking at that phone number. It's not (indiscernible). 09:16

THE CHAIR: Do we have a number to try?

MS. LEMKE: Roger, can you write this down? 1-778-907-2701.

THE CHAIR: Okay. So, Mr. Rondeau, if you're going to call in on the phone, it might be a good idea to unmute the microphone on the bottom left corner, just click on that icon and mute it. 09:18

MS. LEMKE: Do you have the meeting ID number, Roger? We can't hear you.

THE CHAIR: We can't hear you.

MS. LEMKE: Do you have the meeting ID? Can you just nod or no?

Okay. So here's the meeting ID: 99182835910. So that number again is 99182835910, and here is the pass code: 936268. 936268.

THE CHAIR: He can't hear on the phone either, he's suggesting. There's no way that we could do sort of a patch...

MR. LANDRY: Mr. Chair, I wonder if I might help, having run into a difficulty like this before. If you have a speakerphone there, one idea would be to have Deana call Roger on his phone, and then you could do it that way. 09:22

THE CHAIR: Yeah, that would work if we were to have a speakerphone, but we could put a cellphone on speaker mode.

Is that Mr. Landry offering technological assistance? Thank you.

MR. LANDRY: You can literally use anybody's iPhone or whatever and put it on speaker. You just have to get it near a mic is the only issue that probably will happen. 09:23

MS. LEMKE: Yes. What's your phone number, Roger?

MR. RONDEAU: (Indiscernible).

MS. LEMKE: Can you turn off the volume on your computer, Roger. Listen through your phone.

MR. RONDEAU: How is this now?
THE CHAIR: There's still a long echo.
(DISCUSSION OFF THE RECORD)
UNIDENTIFIED SPEAKER: Okay, go ahead, Roger.
MR. RONDEAU: Right now is good?
THE CHAIR: Well, we're still getting the echo.

This is what the 3:00 check-in was for yesterday.

MR. RONDEAU: Yes. I'm really sorry about that, folks. 09:26
MR. LANDRY: Mr. Chair, one of the only things I think -- I'm not going to recommend this, but I think it's a possibility. I think if he closes his computer off and just stays on his phone, it will get rid of that echo.
THE CHAIR: Yeah.
MR. RONDEAU: How about now?
THE CHAIR: Okay. Have you turned offer your computer speakers?
MR. RONDEAU: I have, yes. 09:26
THE CHAIR: Okay. Mr. Landry, can you hear Mr. Rondeau?
MR. LANDRY: Yes, I can, Mr. Chair.
THE CHAIR: Okay. We may have a fix.
MR. RONDEAU: Okay. Again, I'm really sorry. I

should have participated yesterday as the Chair said.

What I have is, in going through our research for people who have taken contracts or companies that have taken contracts through Yukon Energy Corporation, we came across a Yukon company, 12094 Yukon Inc., or Dynamic Systems, which is owned by an Andre Fortin.

Now, if he's still -- if he is a member of this organization or still has some interest in it, we would think he would recuse himself from hearing anything with Yukon Energy. 09:27

MR. FORTIN: May I reply to that?

THE CHAIR: Yes.

MR. FORTIN: Roger, 12094 Yukon Inc. was sold in October of 2007 for lock, stock, and barrel. I have no interest in that company or any other electrical company in the Yukon.

MR. RONDEAU: Very good, Andre. Sorry to make all this inconvenience for everyone. I will definitely get my ducks in a line for the main hearing.

Our consultant will be handling the rest of the 09:28 BESS for us regardless.

THE CHAIR: Next time, Mr. Rondeau, try to make your research a bit more current.

MR. RONDEAU: Well, that's what came up on the computer, so...

THE CHAIR: All right. So --
MS. SABO: Sorry, it's Alison Sabo here, counsel for the Board.
Good morning, Mr. Rondeau. I just want to confirm that you have no objections now to the composition of the Panel?
MR. RONDEAU: No, if he has no interest in the company any longer, that's what I wanted to make sure of.
MS. SABO: Thank you, sir. 09:29
MR. RONDEAU: Yes. Again, sorry, everyone.
THE CHAIR: Okay.
MR. RONDEAU: Thanks for the patience.
THE CHAIR: All right. And there's no objection to the Board having jurisdiction to deal with this matter?
MR. RONDEAU: Not at all.
THE CHAIR: Okay.
MR. RONDEAU: None at all.
THE CHAIR: Very good. 09:29
MR. RONDEAU: Okay. Bye now. Thanks, Deana.
THE CHAIR: Okay. So for the benefit of the members of the public who may not already have access to the online background information about the subject matter of this application, I will give a brief history

of the application and the Board's process.

On February 2nd of this year the Minister of Justice forwarded to the Board an application from the YEC for an Energy Project Certificate and Energy Operation Certificate regarding the proposed project.

YEC described the project and the application as follows, and here I'm quoting directly from the application:

"The Project will install a containerized lithium ion Battery Energy Storage System on a 1.5 hectare site that Yukon Energy will lease on undeveloped KDFN (or Kwanlin Dün First Nation) Category B settlement land located northeast of the intersection of Robert Service Way and the Alaska Highway. The BESS will be connected to the Yukon Energy Whitehorse Rapids facility by a new 1.7 kilometre 34.5 kV transmission line that goes north of the KDFN site, following existing easements through forested crown land until it meets and follows the path of the existing ATCO 34.5 kilovolt line to the

09:30

09:31

Whitehorse Rapids facility."
This is referred to in the application document itself as: (as read)
"Appendix A, Figure A-1 for a map of the BESS site, the Project transmission line connection to the Whitehorse Rapids facility, and the connection therein to the Riverside Substation."
THE COURT REPORTER: Sorry, Mr. Chair. It's Donna, the court reporter. Can you speak up a little bit? I'm having some problems. 09:32
THE CHAIR: Thank you for reminding me of that. Is there anything you missed?
THE COURT REPORTER: No, you're fine. Continue on.
THE CHAIR: If there is any -- I'm reading from a document that's on the record anyway, so you may be able to refer to that later if you need to: (as read)
"The Project will involve a grid-sized BESS with 40 megawatt hours of useful energy storage capacity and 20 megawatts of inverter and transformer capacity that together will provide 7.2 megawatts of dependable capacity. (i.e., displace four 1.8 megawatts diesel rental units) 09:32

to the YIS (or the Yukon Integrated System) for 20 years, starting in the winter of 2022/23.

The 7.2 megawatt of dependable capacity provided by the Project will reduce Yukon Energy's need to rely on rental of diesel generators during the winter months to address capacity shortfalls. The BESS will also provide other benefits, including: operating reserve that reduces thermal generation requirements; enhanced blackstart capability; opportunities for diesel-peak shifting; and other system benefits. 09:33

The preliminary capital cost estimate in 2020 dollars, plus or minus 30 percent accuracy, is $31.7 million; after the $16.5 million funding from the Federal government Investing in Canada Infrastructure Program, the preliminary net capital cost estimate for Yukon Energy is $15.2 million." 09:33

Again, I'm quoting from the application document itself.

The application reference is Part 3 of the

Public Utilities Act, and on February 2nd of this year, the Minister referred the matter to the Board for review and hearing. The Minister provided, in part, the following background information for the terms of reference. And this is taken from the Minister's letter.

On June 22, 2017, Yukon Energy Corporation (YEC) filed its 20-Year Resource Plan: 2016 to 2030 as part of its 2017-2018 General Rate Application (or GRA). The 2016 Resource Plan identified a grid scale Battery Energy Storage System as a medium-term solution to partially address a dependable capacity shortfall for the Yukon Integrated System under its single contingency (N-1 or N minus 1) capacity or reliability criterion that at the time approximated 6 megawatts in 2017, increasing to about 13 megawatts by 2020 and 23 to 24 megawatts by 2021. 09:35

In Board Order 2018-10, the Yukon Utilities Board noted a number of risks and concerns regarding proceeding with a grid scale BESS including concern that the technology had not been demonstrated in a northern climate and further that it would be risky to undertake the project absent third-party funding. 09:35

In 2019 Yukon Energy in collaboration with Yukon Development Corporation (YDC) and the Department of

Community Services submitted a BESS Project funding application to the Government of Canada's investing in Canada Infrastructure Program.

On September 3, 2019, the Government of Canada committed $16.5 million towards development of the BESS Project by Yukon Energy in the Whitehorse area on the overlapping Traditional Territory of the Ta'an Kwach'an and the Kwanlin Dün First Nation -- the Ta'an Kwach'an Council, sorry, TKC, and the Kwanlin Dün First Nation, KDFN. 09:36

Yukon Energy has completed a feasibility study for the BESS Project, including engagement with TKC and KDFN and the public on three site options owned by either TKC or KDFN in the Whitehorse area, and has also concluded a Term Sheet with TKC and KDFN for their support and benefits from the BESS Project that includes a debenture investment opportunity for both TKC and KDFN.

In November 2020, following completion of the feasibility study and Term Sheet, Yukon Energy decided to proceed with final plans and approvals for the 09:37 BESS Project to be fully commissioned by 2022 on the selected KDFN sites, subject to Yukon Energy being able to start construction and procurement in July 2021.

A proposal for the BESS Project will be submitted in March 2021 in the Yukon Environmental and

Socio-economic Assessment Board (YESAB) under the *Yukon Environmental and Socio-economic Act*. This process will lead to the recommendation by the Designated Office, and a response by the Yukon Government, KDFN and other decision bodies in the form of a "decision document." Any government authorizations issued in support of the project, including any Energy Project Certificate or any Energy Operation Certificate under Part 3 of the *Public Utilities Act* will have to conform to the decision document. 09:38

The BESS Project has been designated, in OIC 2020/180, as a regulated project under Part 3 of the *Public Utilities Act* pursuant to section 36 of that Act on December 17, 2020.

On January 21, 2021, YEC applied under Part 3 of the *Public Utilities Act* for an Energy Project Certificate and an Energy Operation Certificate regarding the BESS Project.

In her terms of reference, the Minister stated that the general purpose of the review and hearing is to 09:39 obtain the Board's report and recommendations on the potential benefits, costs, risks and customer impacts that influence whether the BESS Project should proceed as proposed by YEC, and any terms and conditions which the Board considers should apply.

The Board was asked to report on, and make recommendations about, the necessity for the BESS Project and its timing and its design with regard to the following points:

The public need for the BESS 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 and the reliability of electricity service provided to customers. 09:40

The capability of existing and currently committed and expected 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 BESS Project on this capability.

The risks for the BESS Project and their potential impacts on rates for customers and on the reliability of electricity service provided to customers.

Fourthly, what, if any, reasonable alternatives 09:40 exist to the BESS Project, or alternative ways of undertaking the BESS Project with its selected technology might be advisable given reasonable load assumptions and risk assessments.

Impacts on YEC and ratepayers of the debenture

investment opportunity YEC is providing to TKC and KDFN in recognition of the BESS Project's location on the overlapping Traditional Territory of TKC and KDFN and the benefits of TKC and KDFN support for this Project's development at this time.

Finally, whether it is prudent to build the BESS Project as proposed at this time.

The Board will provide a recommendation on whether YEC should be granted an Energy Project Certificate and an Energy Operations Certificate for the BESS Project and, if so, whether the certificates should be subject to any terms and conditions. The Board may make any other recommendations or provide any other information that it considers advisable in the circumstances. 09:41

As this will be a report and not a decision document, the Board has established a process for final comments on the application after the oral hearing concludes. Parties, in accordance with the proceeding schedule from Board Order 2021-06, may make final submissions by May 13, 2021. 09:42

Regarding final submissions, the Board would appreciate each party organizing its submissions in line with Section 3 on pages 2 and 3 of the Minister's terms of reference. And those may be found on the Board's website under the heading for this project.

To assist the parties in preparing for the proceeding, the Board circulated the protocol for this virtual hearing in a letter dated April 27, 2021. Parties having questions about that protocol, the procedures or process should contact the Board's executive secretary, Ms. Deana Lemke.

The sitting schedule for the hearing will be, over the next three days, will be from 9 a.m. to approximately 5 p.m. each day. The morning and afternoon sessions will each have two breaks, the timing 09:43
of which may be adjusted according to the flow of the hearing and witnesses' testimony. There will be a lunch break each day from noon to 1:30.

The Board will first hear from the witnesses for the YEC, then the interveners may cross-examine the YEC witnesses in alphabetical order, as registered. And the alphabetical order referring to the registered participants.

The Board counsel, staff, and Panel members will then ask their questions of the YEC witnesses, following 09:44
which YEC will have an opportunity to conduct re-direct-examination of its witnesses to clarify or complete answers that were given during cross-examination or questions from the Board or Board staff. This will not be an opportunity to introduce new

evidence that is not within those parameters.

MS. SABO: Mr. Chairman, it's Alison Sabo. You're fading out a little bit on sound.

THE CHAIR: Okay.

As noted in the Board's protocol letter, undertakings that may arise from this proceeding may be submitted by Tuesday, May 11th, 2021.

Before concluding, I remind parties and their counsel about the appropriate use of aids to cross-examination. The purpose of an aid to cross is to assist the parties questioning of a witness about the evidence of that witness, and it should only be used if it assists in the questioning of a witness, not to help the witness formulate a response. Questions that can be put to a witness directly should be asked without use of an aid to cross-examination. 09:45

The party proposing to question the witness should submit a copy of the aid to cross-examination to the witness counsel and Board counsel at least 24 hours before using the aid to cross-examination. Providing the aid to both the relevant counsel and the Board before the witness testifies allows the witness an opportunity to become familiar with the document and increase hearing efficiency. The party questioning a witness does not submit the aid to cross-examination 09:45

for the Board secretary or Board members at the time it sends it to the counsel for a witness and Board counsel.

The party, after questioning the witness, can ask the Board to give the aid to cross-examination an exhibit number. The Board will then decide whether that aid to cross will be filed, and if so, it will be given an exhibit number for the purposes of keeping track of this document.

If the Board gives the document an exhibit number, 09:46
a copy also must be provided to the Board's executive secretary in an electronic format at that time.

To facilitate efficient marking of exhibits, the Board's executive secretary, Ms. Lemke, has circulated a list of exhibits received to date, and this list will be updated and circulated to the parties and their counsel daily.

Now, I would ask Ms. Sabo, counsel for the Board, to proceed to register the parties to this hearing.

MS. SABO: Thank you, Mr. Chairman. I'm 09:47
aware that parties have preregistered...

THE CHAIR: Ms. Sabo, we lost your sound.

MS. SABO: Oh. Thank you.

Mr. Landry, can you register your parties on behalf of YEC?

MR. LANDRY: Thank you, Ms. Sabo, Mr. Chair. My name for the record is John Landry, and I appear as counsel for Yukon Energy Corporation.

And, as you know and as has been identified to Ms. Lemke, we will be having one panel of witnesses, which I will introduce at the time of starting our submissions to the Board.

THE CHAIR: Thank you.

MS. SABO: Yukon Electrical Company Limited, operating as ATCO Electric Yukon, anyone from there to register? 09:48

MR. CULLINGHAM: I am Chris Cullingham, and I'm representing ATCO in this proceeding.

MS. SABO: Thank you, Mr. Cullingham.

Mr. John Maissan, are you here to register?

MR. MAISSAN: Yes, I am here and I'm registered. Thank you.

MS. SABO: Thank you. And the Utilities Consumers' Group?

MR. MCMAHON: It's Pat McMahon here. I know Roger is having trouble with his microphone, so I'll register for Roger Rondeau, as well as myself for UCG. 09:48

MS. SABO: Thank you for that, Mr. McMahon.

And Yukon Conservation Society?

MR. PRESSNAIL: Hello. It's Scott Pressnail here

on behalf of the Yukon Conservation Society.

MS. SABO: Thank you, Mr. Pressnail.

Is there any other person that wishes to register as an active participant at this time?

Hearing none, Mr. Chair, the parties are now registered for this proceeding.

Unless there are any other preliminary matters to which any registered party may wish to raise, you may choose to call on Mr. Landry for his introduction of his witness panel and to confirm that the individual witnesses have been sworn in. 09:50

THE CHAIR: Yes. Okay, over to you, Mr. Landry.

Could you please introduce your witness panel and confirm that the members of the panel have been sworn in.

MR. LANDRY: Mr. Chairman, may I first start by expressing on behalf, I'm sure, of all parties the gratitude for Ms. Lemke and the rest of the crew that have put this virtual hearing together. 09:50

Having taken part, as I'm sure you have, sir, in the last year on these type of hearings where I think we all were a little kind of unsure or skeptical about whether or not they could proceed in a fair and efficient manner, there are little blips in the road,

usually at the very beginning, like we had this morning, but I think we're all pleasantly surprised that these type of hearings can go forward as they do in a fair manner, and I know how hard it is to put one together, having done a couple myself in the early days of this very trying time that we're in, and I would just like to express my gratitude for that.

Sir, we'll be having, as I indicated to you a moment ago, one panel of four witnesses.

As I understood, the protocol that was put out by Ms. Lemke was that they were going to be affirmed virtually, so I leave it to Ms. Lemke and her team to decide when we do that. 09:51

I can introduce them first perhaps is the best way to do it to help her a little by, and then after that, we can go to the affirmation, if that would be okay with you, sir.

THE CHAIR: Affirmation is fine.

MR. LANDRY: Okay. So today we're going to have a panel of four witnesses. They have been formally identified according to the suggestion of Ms. Lemke to the Board. 09:52

Firstly, three will be appearing together, Mr. Chair, and the fourth will be appearing virtually. The three together are at the Yukon Energy's offices

now, and they'll be headed by Mr. Andrew Hall, who is the president and CEO of Yukon Energy; Ed Mollard, who is the vice-president, finance and chief financial officer of Yukon Energy; and the third will be Mila Milojevic, and she is the vice-president, resource planning and regulatory affairs at Yukon Energy. Those three panel members, Mr. Chair, will be appearing together in Yukon Energy's boardroom.

The fourth panel member is at the request of the Board, a representative of Hatch Limited, who, as you know, created a report for the BESS Project, and her name is Jocelyn Zuliani, and she is the energy storage lead at Hatch Ltd. 09:53

So --

THE CHAIR: Thank you.

MR. LANDRY: -- perhaps I can hand it over to Ms. Lemke, or whoever is going to perform the affirmation, and then we can have a quick introduction of this project.

MS. LEMKE: The court reporter has agreed to affirm the witnesses. 09:53

THE CHAIR: Madam court reporter, can you lead the affirmation, please.

M. MILOJEVIC, A. HALL, E. MOLLARD, J. ZULIANI (For Yukon

Energy Corporation), affirmed

MR. LANDRY: So, Mr. Chair, what I intend to do, just so that everybody is aware, is, I would like each of the panel members to give a bit of their background so that people are aware of what the background is and how they play into the project that we're here to discuss today, and then Mr. Hall will provide just some brief opening comments.

MR. LANDRY EXAMINES THE PANEL:

Q. So, with that, if I can start with Mr. Hall. 09:55

Mr. Hall, I wonder if you could explain to the Board your role at Yukon Energy?

A. MR. HALL: Certainly. Good morning. Been here six years, president and CEO. So overall managerial and strategic oversight of the company.

Q. And Mr. Mollard?

A. MR. MOLLARD: Yes, vice-president of finance and chief financial officer. I've been in this role for approximately 14 years. All the finance responsibilities, utility billing, treasury, et cetera, as well as advising on strategic issues at the senior management level. 09:56

Q. Thank you, sir.

And Ms. Milojevic?

A. MS. MILOJEVIC: Yes, I'm the vice president of

resource planning and regulatory affairs. Our team does the assessment and permitting for projects and would have overseen the feasibility engineering study done for the battery project. We do the preconstruction design and permitting process for projects for YEC.

Q. Thank you. And, Ms. Zuliani, could you just give us a summary of your position at Hatch and your role in the BESS?

A. MS. ZULIANI: So I'm Jocelyn Zuliani. I'm the energy storage lead with Hatch Limited. I've been working with Yukon Energy on this project since January 2020, and was one of the main authors on the feasibility study. 09:56

Q. Thank you.

MR. LANDRY: So, Mr. Chair, with that, I will hand it over to Mr. Hall to provide some opening comments in relation to this application.

THE CHAIR: Thank you.

A. MR. HALL: Thank you, Mr. Landry. 09:57

I will also start off by acknowledging, as the Chair did, that Yukon Energy operates on the Traditional Territories of a number of Yukon First Nations, and we're certainly appreciative of those First Nations allowing us to use their land and

territories.

This project, in particular, is on the overlapping Traditional Territory of the Ta'an Kwach'an Council and the Kwanlin Dün First Nation, and as we presented in the application, there are meaningful and significant opportunities for those First Nations to participate and benefit in the project going forward.

So with that, good morning to you, Mr. Chair, the members of the Yukon Utilities Board, supporting staff from the Alberta Utilities Commission, interveners, and members of the public. Thank you for the opportunity to appear over the next few days before the Board to discuss Yukon Energy's Battery Energy Storage System Project. 09:58

We submitted formal written remarks and an opening statement to the Board on Friday, so I'll keep my oral remarks fairly brief.

We bring the battery project before this Board at a pivotal time for Yukon Energy and for energy supply in the Yukon. We face the challenge of meeting continued growth in demand for electricity in the Yukon, at a time when both the federal and territorial governments have committed to ambitious targets to reduce greenhouse gas emissions, and these targets directly impact Yukon Energy's strategy and operations 09:58

going forward.

At present, Yukon Energy faces a shortfall in dependable capacity to meet peak demand under emergency conditions. This shortfall is forecast to increase significantly in future years as a result of continued economic growth in the Yukon and a drive towards electrification to address climate change.

At present, we close this capacity gap by renting a mobile diesel generators each winter. Our 10-year renewable electricity plan outlines a portfolio of new 09:59
permanent projects that we plan to develop to address this capacity gap. The battery project is a critical near-term element of this project portfolio.

We firmly believe that the battery project is very attractive for Yukon ratepayers for a number of reasons.

Firstly, we have secured $16.5 million of funding from the federal government to offset a substantial part of the forecast capital costs of the project.

Secondly, and most importantly, the project adds 10:00
7 megawatts of permanent, dependable capacity to our system. This will eliminate the need for us to rent four mobile diesel engines each winter.

Next, the battery project delivers economic benefits to Yukon ratepayers by displacing thermal

generation for what is referred to as operating reserve. This is a benefit that thermal alternatives to the battery, such as a new diesel plant, simply cannot deliver. These benefits have been conservatively estimated to have a net present value to ratepayers of over $12 million.

And, finally, the battery will deliver a number of reliability benefits to the Yukon grid and to our customers. These grid services include faster restoration from grid outages and improved integration 10:01 **of intimate and renewables such as solar and wind.**

We also believe that the First Nation debenture investment proposed for this project will enable Yukon First Nation investments in new YEC projects without any impact to ratepayers.

In summary, Mr. Chair, the battery project will directly reduce Yukon Energy's reliance on thermal generation, provide savings to ratepayers when compared to available alternatives, increase the reliability of the Yukon grid, and provide a new path forward for 10:01 **First Nation investments in clean energy development.**

We look forward to addressing your questions on this project over the next few days. Thank you.

MR. LANDRY: So, Mr. Chair, those are the opening comments, and those are all the questions that

I have for this panel.

So I place it back before the Chair, and the panel is ready for cross-examination.

THE CHAIR: Thank you, Mr. Landry. I'm just mindful of our commitment to provide a few breaks.

This is a 9 till 12 morning, and there will be a lot of hearing segments, so it might be an appropriate time to take a brief ten-minute break, and then we can resume with cross-examination of the witnesses.

So -- 10:02

MS. SABO: Mr. Chairman --

THE CHAIR: Yes?

MS. SABO: -- I'm just wondering if I could just ask one preliminary question before we break that might help facilitate us when we come back from the break.

I was wondering if Mr. Landry, or one of the Yukon Energy witness panel, can confirm whether they'll be working off the consolidated set of IRs, that includes all of the IR responses, or if they will be 10:03 working off individual copies. There may be PDF references that parties are referencing. We want to make sure we're all working on the same version.

MR. LANDRY: Perhaps I could hand that over to the panel, and they could explain what references they

will be making.

I would note, Mr. Chair, as I think is appropriate, that the panel does have a computer on the panel, it is not connected to the Internet, it is for the purposes of referencing the material that's there.

But I'm not sure exactly, in specific response to the question, so I'll hand it over to the panel and perhaps they can answer that.

Mr. Hall?

A. MS. MILOJEVIC: Yes, Ms. Sabo, we will use the consolidated IR package to reference page numbers. 10:04

MS. SABO: Thank you. And, Ms. Zuliani, you as well?

A. MS. ZULIANI: Yes.

MS. SABO: Thank you, panel.

Thank you, Mr. Chairman, for that brief interruption.

THE CHAIR: No, that makes good sense to have that information before we break in case any adjustments need to be made. 10:04

So, yes, we'll be back in ten minutes.

(ADJOURNMENT)

THE CHAIR: Okay, counsel, are we ready to resume?

MR. LANDRY: Mr. Chair, from Yukon Energy's

perspective, we're ready to resume.

THE CHAIR: Ms. Sabo? Ms. Sabo, are you ready to proceed? Ms. Sabo, are you able to hear us?

MS. SABO: Yeah, I am here. I'm sorry, my head set died. That was the delay. So I didn't hear anything that was said.

THE CHAIR: Not much was said. Just wanting to know if you're ready to proceed.

MS. SABO: I think it is up to Mr. Maissan to proceed? 10:19

THE CHAIR: Yeah, no, I'm just checking with you as to your readiness.

And Mr. Maissan?

MR. MAISSAN: Good morning, yes. Can you hear me adequately?

THE CHAIR: Yes, I think we can hear you.

MR. LANDRY: Mr. Maissan, if you could just keep your voice up a little bit. I'm having a hard time hearing from my perspective.

MR. MAISSAN: Okay, I apologize for that. I 10:20 adjusted my microphone a bit this morning because it was coming through my headphones rather louder than I liked, and now I can't seem to turn it up without going through the whole start-up process.

So can you hear me now adequately, John?

Mr. Landry, sorry.

MR. LANDRY: Yes, that's fine.

MR. MAISSAN: Thank you. All right.

MR. MAISSAN CROSS-EXAMINES THE PANEL:

Q. I have several questions in cross-examination. I will be referring to IRs as I go along. I will generally follow the flow of the application.

And my references are to specific IRs, and I refer to them by -- well, let's call them by name rather than by pdf page number. So if this causes any difficulty, please let me know and I will reference them on the consolidated IRs by pdf page number. 10:21

My first question is in regard to YUB-YEC-1-13, and the response in four parts (a) to (c).

And the question is: Can YEC provide an update on the procurement process covering the period from when the IR response was submitted to the present?

A. MS. MILOJEVIC: So we are in the midst of our two-stage procurement process. The first stage, the proposal closed in March of 2021. We received submissions and have evaluated those submissions. 10:22

The next stage of the process will be to invite vendors who passed the commercial qualifications of the Stage 1 to participate in Stage 2, which will take the form of a request for proposals.

So we have identified which vendors are going into the Stage 2 process.

Q. I see. And, at this point, the list of vendors is not public information?

A. MS. MILOJEVIC: That's correct, it is not public.

Q. Thank you. The next question references IR response to JM-YEC-1-14 and also the application on page 10. And this is in regards to LNG peak shifting.

Could you please explain under what circumstances LNG peak shifting would be operationally feasible? 10:23

A. MR. HALL: Mr. Chair, I think, in general, our dispatch -- what's called dispatch, and that's the order in which we run units in our system, if we are short of generation from hydro and need to run thermal, we run the LNG units in preference, subject to there being sufficient time for those units to run, because the LNG units typically have a minimum run time that we like to maintain.

So the opportunity to peak shift LNG, John, Mr. Maissan, would be in a case where we have LNG 10:24 **generation on so the load is such that we just have LNG on the system and there's enough to meet either the morning or evening peak, and we have an opportunity to use the battery to essentially replace that LNG generation.**

Q. Based on your response, then, are there situations in which a diesel generator would be run because you only need a small amount of peaking power for a short period of time?

A. MR. HALL: Yeah, correct. So there could be situations where you only need an extra, say, 1 megawatt of generation for a short duration, as you pointed out an example. And so, you know, in those cases we would run diesel in preference to LNG.

Q. Right. This morning, I circulated an exhibit that I thought might be used as an aid to cross. Since I haven't given you 24 hours advance of this information, I will try to ask the questions without referencing those. 10:25

The situation is on -- I provided two examples on March the 19th and also for April the 7th -- sorry, 27 -- in which LNG was probably used for a short period of time on March 19th for about seven hours, totalling 24.42 megawatt hours, and prior to that, through the nighttime, the hydro required was quite a bit lower because of night, the load is lower. 10:26

And I wondered whether these are examples where LNG peak shifting could happen, or could have happened?

A. MS. MILOJEVIC: Well, Mr. Maissan, I can't comment particularly as I'm not sure whether in those hours it

would have been diesel running or LNG running.

But as Mr. Hall said, if we had a situation where LNG would just be needed for a few hours and wouldn't be needed to be turned back on after you were through the peak, that's where the potential to be used for LNG peak shifting, the battery could be used to provide that.

Q. All right. And would that be subject to the state of the water levels in the reservoirs, i.e., if you were short of energy, would there be situations where you might use LNG or diesel during the peaks, but not use the BESS because you didn't have hydro to charge it from? 10:27

A. MS. MILOJEVIC: I don't believe so. It would be more about the operational limits of the LNG units that would prevent you potentially from LNG peak shifting rather than hydro availability.

Q. Right. So, in these circumstances I've described, diesel was being used, then the BESS could have been used to shift that short diesel peak? 10:28

A. MS. MILOJEVIC: That's correct, yes.

Q. Thank you. My next question references IR Response JM-YEC-1-15, and particularly referencing part (b) and Attachment 1.

In the tables of the actual diesel and LNG

generation provided, the LNG generation figures suggest that there were only two LNG generators running for part of this past winter, November through February, and I don't have information past that. Is this correct?

A. MR. HALL: Yes, that's correct.

Q. Was one of them unavailable because of problems, mechanical problems, or...

A. MR. HALL: Yes. We had one unit down due to problems we encountered last year, and it was down for most of the winter.

10:29

Q. Has it been restored to service now?

A. MR. HALL: It is under repair right now. It will be in service in -- a little later in May.

Q. Thank you. Is this the first winter in which an LNG generator was not available through the wintertime?

A. MR. HALL: Subject to check, yes, I believe so.

Q. Thank you. Does the forecast supply for thermal generation of 90 percent LNG, 10 percent diesel, this mix, does it take into account potential downtime, such as experienced this winter?

10:30

A. MR. MOLLARD: Mr. Chair, the 90/10 that Mr. Maissan is referring to is the ratio we use for the purposes of determining thermal generation in our

revenue requirement proceeding, in the GRA.

It's something of a theoretical calculation that we've done to estimate what, over the very long term, we use the thermal generation, the allocation between those two modes of generation, the LNG and diesel.

I don't want to say that it specifically allows for out-of-service units. It, again, tended to be a long-term look at the availability.

Q. All right. Long term, then, in this case, presumably, over the long term, there are allowances for unscheduled downtime? 10:31

A. MR. MOLLARD: Yes, in theory. Mr. Chair, we visit this formula all the time when we come back before the Board.

The ratio was developed before we put the units into service. We had to come up with some -- some formula to determine what the split would be, and we estimated it based on what we thought would happen over the long term.

But we do look at that each time we review our rates and our revenue requirement to see if it's still applicable, and the Board asks us questions on that at the GRA proceeding. 10:31

Q. Right. So that's a GRA issue that you deal with during GRAs, and -- right. Okay, no question there.

Thank you.

This extended downtime that was experienced this winter, then, is that covered under the reserve for injuries and damages?

A. MR. MOLLARD: Yes. There's several components to the accounting for that failure. There was concession granted by the manufacturer for certain items that failed prematurely. There also was some insurance coverage for sudden accidental failure of a thermal unit, and the residual balance will be recorded into the reserve for injuries and damages, as you note. 10:32

Q. Right. And am I correct in understanding that ratepayer funds the reserve for injuries and damages, that's part of an annual allocation that goes to rates?

A. MR. MOLLARD: Yes.

Q. Thank you. Based on this second table that is provided in the attachment to this IR, it is evident that there would be significant thermal generation year round if we had long-term average water and the present load of 542 gigawatt hours per year. 10:33

Does this mean that there would be year-round opportunity for diesel and/or LNG peak shifting with a Battery Energy Storage System?

A. MR. MOLLARD: Sorry, Mr. Maissan, could I trouble you to repeat the question, please.

Q. Certainly. In the second table provided in the attachments under 2021, there is the actual hydro and thermal generation -- sorry, long-term -- well, actually -- for 2021 and long-term average water, the expected thermal generation, which is the extreme right-hand column, continues right through the summer, it's not just through the winter period.

So it would seem to me that there is a possibility that there is year-round opportunity for both diesel and/or LNG peak shifting, and I'm asking if that is indeed the case. 10:34

A. MR. HALL: Mr. Chair, I think there are a couple of points to note here. The one is, that that would be the case if -- in a year where we actually have received long-term average hydro with the current configuration. In other words, no new renewable resources added to the system.

So it's a true statement in the short run, while we have our current grid configuration; but, obviously, as our planned and our 10-year renewable plan, we are planning to bring a number of additional renewable resources forward, which would reduce the LTA thermal requirements. So I think that's just a caution in terms of, you know, Mr. Maissan's assertion. 10:35

For example, you know, we know that we have

substantial supply coming online from the independent power producer sector through the Standing Offer Program, and those would be, you know, mostly solar and possibly some wind and small hydro as well, and that would supply quite a substantial increase to our summer generation, which would probably cut back the opportunities during the summer for that peak shifting, Mr. Maissan.

Q. All right. And, presumably, though, over time the load will grow as well, and so it's a matter of what the actual, I guess, balance is between the renewable supply and the load in any given particular year? 10:36

A. MR. HALL: Correct. I think the other point to note is the opportunities to peak shift are also related to the load shape and, you know, how cold -- you know, what your weather conditions are. In other words, how peaky your system is, how big those system loads are during the depth of winter in particular, which is not something that's very easy to forecast into the future, you know, the weather. 10:37

So it would change quite a bit from year to year in terms of where those real peak shifting opportunities arise or not.

Q. When the benefits for the Battery Energy Storage System were being calculated, then, there were forecasts used

for what the load shape would be and the renewable energy supply would be going 20 years forward?

A. MR. HALL: Yeah, it's outlined in the application and in the Hatch report as well. There was a specific methodology used to value the diesel peak shift opportunity, which I believe was based on the 2019 actual operating load shape.

Q. Okay. I just wondered, looking at this table and looking at the application on page 24, and which there is a statement that -- I'll give you time to find that. 10:38
I will move my own copy forward here as well.

In the middle paragraph on page 24, the suggestion is that there is a surplus of renewable energy generation during the summer.

So under long-term energy -- or long-term average water availability, there would presumably not be a surplus of energy in the summer of 2021, given that the table shows thermal generation throughout the summer.

A. MR. HALL: I think I would point out that 2021 is not a year where we have long-term average 10:39
hydro generation. We have quite a bit more hydro resources available.

So I think it's a bit confusing to mix a specific year, i.e., 2021, with , you know, a hypothetical case, namely, a long-term average year.

Q. Well, in the long term, presumably, you do have long-term average water, and there will be years when water is lower and years when water is higher.

But if we had the 2021 load for a long period of time, then that long-term average would suggest that there would be thermal generation absent more renewable energy coming onstream?

A. MS. MILOJEVIC: That's correct, yes.

Q. Thank you. But this particular summer, given our present water conditions, you expect that there will be a surplus of hydro this summer, surplus renewable energy this summer? 10:40

A. MR. HALL: Yes.

Q. Thank you. My next question relates to a reference in the application on page 11, and the response to JM-YEC-1-19.

When I asked this IR, I was looking at the three bullets on page 11, and they seem to be referencing -- the first two of the three bullets seem to be referencing the best responses that may be expected under the conditions described. 10:41

The third bullet implied to me that the BESS might not -- might be constrained in some way by water flow limitations.

The response to the question, however, says that:

(as read)

"There is no operating reserve available from the hydro plants."

Am I interpreting this correctly?

A. **MS. MILOJEVIC: So there are points in time in winter where operating restrictions -- so, for example, a unit output being set at a certain output in order to deal with icing formation where the unit -- the hydro units cannot provide operating reserve. But that -- the battery -- the calculation of the battery savings from operating reserve are shifting when the hydro units provide operating reserve to when the battery units can provide it.**

So there's no battery operating reserve benefits during those periods of time since they're based on being able to increase the output of the hydro units. That's what the battery operating reserve benefits are based on.

10:42

Q. All right. So it's not that the BESS standard -- I'll call it the BESS rather than say it out each time, the BESS system. It's not that the BESS system is in any way constrained, it's just that it cannot provide a benefit at that time. It doesn't mean it's not available to provide benefits should circumstances be different?

10:43

A. MS. MILOJEVIC: That's absolutely right, Mr. Chair.

So when we -- how the operating reserve benefit of the battery was calculated, we looked at when hydro units were not operating at their full output. When they're held back, they can then ramp up to provide reserve in the event the load changes or we lose a generator.

The battery, simply by being connected, provides that benefit, but how we calculate the savings is we look at the increase in hydro generation that those units can be ramped up because the battery is online providing that reserve instead.

So when you have instances where the hydrogenerators cannot be ramped up due to operational limitations, the battery can provide operating reserve, but we don't include those benefits from those hours in the calculation of the ratepayer savings.

10:43

Q. Thank you, yes. I wanted to establish whether the BESS was indeed available through the whole winter, and it sounds like it is, only in some periods of time, there is no benefit from it.

10:44

A. MS. MILOJEVIC: That's correct, yes.

Q. Thank you. The next reference is to the application on pages 12 and 13, and footnote Number 18, and I will

read a portion here: (as read)

"However, the full benefits of the thermal displacement...are not expected to be realized given the relationship between thermal generation and subsequent hydro storage availability. To be conservative, net thermal generation reduction from BESS operating reserve use is assumed to be only one-third of the Hatch estimates." 10:45

And Footnote 18 refers to a period, "When saved water is mostly spilled."

I'm not fully understanding what these comments are saying and the reasoning behind the, let's call it, two-thirds reduction in benefits as estimated by Hatch.

So I was wondering if someone could explain that to me in a way that I might understand that these quotes don't provide me with.

A. MS. MILOJEVIC: So when we look at the Hatch calculation of the benefits from the operating reserve, 10:45 **it was assumed that any time you could replace the hydro units providing operating reserve with the battery, that that would result in a reduction in your thermal generation.**

But when we think about a long-term average year,

average water year, over the course of the year, we essentially use all of the water storage that we can. So, at one time or another through the calendar year, we will deplete our water storage.

And as you pointed out earlier in your questioning, Mr. Maissan, with the current grid configuration, we still require that thermal generation for energy over the balance of the year.

So the reasons for the reduction by two-thirds is adjusting that in the winter and the fall, it's assumed 10:46
that if you increased the hydro output during hours when the BESS could provide operating reserve, over the balance of the year, you would still end up needing the same amount of thermal generation since your energy balance over the year is still the same.

So we're essentially saying, well, even though you would preserve thermal in those hours, you would need them at some other time because you then used that water storage that is the storage over the year, particularly for the Mayo and the Whitehorse 10:47
facilities.

For the spring and some of the summer, the water flows, because they are so high from freshet, any excess generation available is spilled or used for generation.

So the one-third estimate of the savings is essentially saying we're only counting the operating reserve savings the BESS provides in the spring and summer when being able to generate more hydroelectricity would result in an increase in overall hydro generation in that year.

It is definitely conservative, especially considering that the Aishihik facility has multiyear storage and that there would be times when in winter and fall reducing the thermal generation could impact the entire year, and, of course, there are going to be years with different water levels. 10:47

But in sort of a general conservative sense, we looked at only counting the operating reserve savings during spring and summer when any increase in hydro would likely result in a decrease in thermal generation required over the balance of that year.

Q. Thank you, yes. What was confusing me was the -- in Footnote 18, the comment that, in spring, the saved water would be mostly spilled, and I was thinking if we're using all of the water available, then in facilities like Mayo and Aishihik, the water would mostly be stored as opposed to spilled. 10:48

A. MS. MILOJEVIC: Yes, that's correct.

Q. All right. Starting this year, when we have thermal --

sorry -- starting this year we have thermal generation year-round if -- well, with the load in 2021 that we have this year, then with long-term average water, we do need thermal generation year-round, as we just discussed, and, you know, those numbers in the table in the previous IR response that I referred to seem to show in the order of 4 to 5 megawatts was the average minimum thermal generation for this load under long-term average water conditions.

So it seemed to me that there was benefit in -- 10:49
there would be benefits in most years and there would be very few years in which any savings would get spilled in the form of water.

Is that a correct assumption or --

A. MR. HALL: Mr. Maissan, I mean, correct for our current grid configuration, but, you know, I would point back to my earlier response, which is, you know, we have to look at the forecast grid configuration and the supply options we have over the full 20-year life. So we have to anticipate additional sources of 10:50
renewable supply, you know, joining the system.

And so, I mean, I think your statement is correct again for 2021, but we have to take a broader and longer term view than that.

Q. Right. So it's correct before new generation is added

to the system, but once new generation is added to the system, then there would be increasing periods, particularly in summer, when you do have surplus renewable; is that correct?

A. MR. HALL: Yes, absolutely. And I think our 10-year renewable plan illustrates that in a very powerful way when we assessed the opportunities for seasonal pump storage, which you'll be familiar with, where we showed -- I believe it was the 2024 grid configuration, substantial amounts of summer surplus on the system, you know, contributed by, for example, as I said earlier, the Standing Offer Program, solar component coming through in the summer. 10:51

Q. Right. Thank you. The next question references an IR that the YUB asked. It's YUB-YEC-1-26(b), and this was a question about the tax rate from the City of Whitehorse.

And I was wondering whether, since this IR response was submitted, whether there's been any progress in discussions with the City of Whitehorse with respect to reduced tax rates for renewable energy projects such as the BESS? 10:52

A. MR. HALL: Mr. Chair, we organized a delegation of interested parties to appear before City Council and made two rounds of submissions requesting,

as Mr. Maissan suggested, a reduction in the City taxes; but, unfortunately, we weren't successful.

We just recently received a written response from the City indicating that they would not be adjusting the tax rate, unfortunately.

They did say that they would -- there's potential for them to reconsider in the future, but at this time we are assuming that we will have to pay City taxes on the Kwanlin Dün site.

Q. Thank you. This question has no reference, but I think about a year, a year and a half ago, Yukon Energy created a new position called, I think, vice-president First Nations Relations, or something like that, and I was wondering whether that position has been filled yet? 10:53

A. MR. HALL: Yes, we have filled that position.

Q. And do we have the name for the person in this position that you can share?

A. MR. HALL: Certainly. It's Mr. Chris Milner.

Q. Thank you. The next question references IR response to JM-YEC-1-24. The response to this IR says that YEC is pursuing 5 megawatts diesel at the Whitehorse Rapids facility. 10:53

Given that, I think it's now three Mirrlees generators have been retired and I think removed.

Why would only 5 megawatts be considered for Whitehorse Rapids? Why not three units of 5 megawatts, in addition to the ones planned for Faro and Dawson City?

A. MR. HALL: So, Mr. Chair, I'll point out a couple of issues around this diesel replacement project, which we have not brought forward to the Board yet for any costs associated with this for approval.

But the strategy here, as Mr. Maissan alluded to, is to replace and maintain our diesel fleet at a particular size. You know, what we don't want to happen over time is, as units retire, for us to essentially lose capacity on the system. 10:55

So it's entirely a replacement exercise of capacity that's either been retired already, or in the case of Faro, due to retire in the next couple of years.

So, to answer Mr. Maissan's question, you know, we first sort of assessed how much total capacity we wanted to add back, namely, the 12.5 megawatts, and then looked across the system to identify where it made sense to add that capacity back, which locations. And although our load sensor is in Whitehorse, there are operational reasons why it makes sense for us to spread this generation around the system. 10:55

In particular, we've, for example, seen load growth in Faro, with the remediation from the Faro mine, and some growth in the town of Faro itself, which again speaks to the fact that we really do need to maintain generation in the town so we can run it on an islanded manner, if the town gets isolated, if we have a transmission outage, or we're doing maintenance during the summer. So it's important to have these diesel generators not only in Whitehorse, but spread across the system. 10:56

Likewise, in Dawson, we've seen quite significant growth in the town of Dawson in terms of new construction, new subdivisions getting built, and so -- and we anticipate, you know, further growth in Dawson. So, again, a reason why replacing and maintaining our generation in Dawson is important operationally.

So, Mr. Maissan, when we looked at, you know, that overall assessment, the conclusion was the split of those replacement units across the fleet.

Q. Right, okay. So it's not a matter that there isn't room in the Whitehorse diesel plant to add replacement. It's just that it doesn't -- it makes more sense to spread them out to these other two communities? 10:57

A. MR. HALL: Yeah, correct.

Q. Thank you. The next question references IR response to

JM-YEC-1-26, and I was wondering whether the YESAB project proposal for the BESS Project has now been filed, and if not, when this is expected to happen?

A. MS. MILOJEVIC: Yes, it has been submitted to the Whitehorse designated office.

Q. Thank you. The next question references a couple of IRs. JM-YEC-1-27, and I may also reference JM-YEC-1-16, and possibly also the application on page 24.

Again, this is referencing our discussion regarding the present load, the 2021 electrical load and long-term average water that, under present grid configuration, the load forecast requires year-round thermal generation, and that's without the BESS Project. 10:58

Now, if we then add the BESS to the system, there is a requirement still with long-term average water flows and thermal generation in the daytime -- well, at least in the daytime, which we don't need now without the BESS, so I think if I understood the earlier discussion, then if we'd had the BESS for the load that we have this year under long-term average water conditions, then the short -- there would be short-term benefits available until the grid configuration changed with more renewable energy. Is that the correct 10:59

understanding of your earlier explanation, Mr. Hall?

A. MR. HALL: Mr. Maissan, can I ask that you restate the question? I'm not quite sure that I got it.

Q. All right. If we had long-term average water this year and we had the BESS system available and otherwise the grid configuration is as it is now, without the additional projects that you are working on, that Yukon Energy is working on, then there would be a benefit from the BESS -- the BESS system would be providing benefits, would it not? 11:01

A. MR. HALL: Yes, it would. And I think it's important to raise the helicopter here a bit and remember the primary reason why we're proposing to move forward with the BESS, and that's to provide dependable capacity to the system and avoid having to rent four diesel generators. The benefit is 100 percent there, whether you have LTA water or not. So I think your statement is correct, Mr. Maissan.

Q. Thank you. But if I remember the numbers correctly, then the annual benefit in providing operational reserve was in fact greater than the annual saving and diesel rental, is it not? Or am I getting numbers mixed up? 11:01

A. MR. MOLLARD: 4.3 table.

A. MR. HALL: Yes, correct.
A. MR. MOLLARD: 22 versus 17. So the rate rental is the higher benefit.
A. MR. HALL: Yeah.
Q. Thank you. Now, for years like this year, when we have surplus water, or expect to have surplus water through the summertime, we still have SCADA connected secondary sales customers.

Could they be served on a daily basis through the nighttime hours only? Is that something that can be done for SCADA connected secondary sales customers? 11:02

A. MR. MOLLARD: Yes, I believe that is -- that is possible, Mr. Maissan.
Q. Right. So if we get, over the next couple of years, quite a bit of solar production coming on through the night through the IPP Standing Offer Program, then since they are not generating at night, then, presumably, we might be able to meet load in the daytime, but we can increase load at night with these -- with these secondary sales customers still? 11:03

A. MR. MOLLARD: Yes. Subject to sufficient hydro reservoirs, yes.
Q. Thank you. So these customers will serve to, I guess, reduce the spill of water?
A. MR. MOLLARD: That's correct, yes.

Q. Thank you. The next question is about the new transmission line in the Mayo area.

Are both the new Mayo to McQuesten transmission line and the McQuesten substation now both fully in service?

A. MR. HALL: Yes, they are, yeah.

Q. Thank you.

A. MR. HALL: Well, the substation at McQuesten, Mr. Chair, I'll just clarify the work at Stewart Crossing South sub installed the voltage support equipment, that is still ongoing; but the transmission line between Mayo and McQuesten and the McQuesten sub are in service. 11:04

Q. Okay. So the Victoria Gold Mine can now receive all the electrical energy it needs through the grid?

A. MR. HALL: Correct.

Q. Thank you. How certain is that forecast of 542 gigawatt hours a year with Victoria Gold and Alexco Mining customers they are now? Would you still feel comfortable in saying that's a realistic expectation for grid load for this year, or is it going higher or lower? 11:05

A. MR. MOLLARD: Mr. Maissan, based on what we know today, we believe that forecast is still valid.

Q. Thank you. The next question relates to JM-YEC-1-31.

As I read the response to part (a), my understanding is that the proposed BESS Project could stabilize the grid frequency should a 20-megawatt wind farm be built. Is this a correct interpretation of the response?

A. MS. MILOJEVIC: So the BESS will be able to stabilize frequency within a band that it's set to. I can't specifically predict what impact a 20 megawatt wind farm might have on the frequency of the grid. It would depend on a number of factors, including its location. 11:06

But certainly one of the grid reliability services we expect the BESS to provide is to regulate frequency, and so it certainly would help with renewable integration in that regard. I just can't be specific about, you know, the extent to which a certain wind farm would impact that or not.

Q. Right. There's also mention in the response, I think, that it could be -- it could accomplish stabilization using either ramp-rate control or frequency.

Am I to understand that it can't provide both services at the same time? 11:07

A. MS. MILOJEVIC: I believe it could provide both services at the same time, but we haven't determined the prioritization of those services or, you know, the magnitude of each to be provided, how that would be

divided up.

Q. Right. Okay. Are you aware of any battery energy projects in operation in Canada that are performing this kind of either ramp-rate control or frequency control now? And, if so, do you have some examples?

A. MR. HALL: Mr. Chair, we're certainly aware of battery projects being integrated with wind installations in Canada. Perhaps Ms. Zuliani has a couple of examples that she can refer to.

A. MS. ZULIANI: Yeah. There are several battery projects with wind. One being the Raglan Mine project where the battery is providing ramp-rate control for wind at the mine. 11:08

Another one recently installed in Alberta where the battery is -- called the "Wind Charger BESS," and it's supporting a grid level wind integration on the AESO grid.

Q. Right. And these kinds of grid connected ramp-rate controlled batteries are fairly common in the United States also, are they not? 11:08

A. MS. ZULIANI: Yes. It's increasingly common to see hydro projects where you have renewable coupled with a battery.

Q. Thank you. My last series of questions relate to a reference IR response to JM-YEC-1-33.

And, broadly speaking, this is in regards to the economic justifications for the -- and the benefits from a Battery Energy Storage System.

The Table 4.3 in the application on page 39 is based, I believe, on the 2021 GRA field cost of a 20.51 cents per kilowatt hour for diesel, and 18.14 cents per kilowatt hour for LNG, and it shows that the ratepayer benefits are a little over 12.6 million.

Now, it's -- based on the helpful analyses 11:10
provided in the response, it seems that -- even if the BESS Project came in at 30 percent over budget, it would still be a positive saving to -- of about $2 1/2 million to the ratepayers.

So I would like to sort of explore, you know, some of the benefits and make sure that they are fully reflected, because I'm wondering if there are potentially more benefits here than have been allowed for at present or at least in -- based on the IR, the February and March fuel prices were higher than the 11:11
2021 GRA prices, and if those were used in the analyses, it would appear that the ratepayer benefit over the life of the project was $2 million higher. Am I reading that correctly?

A. MS. MILOJEVIC: That's correct. The overall

savings go from just over $12.6 million on a net present value basis to just over $14.5 million.

Q. Thank you. And do any of these prices include a cost of carbon?

A. MS. MILOJEVIC: No, they do not.

Q. They do not. And why is that?

A. MR. HALL: At present, electricity generation is exempt from the carbon tax in the Yukon.

Q. Is that only in Yukon or is that federally? Nationally?

11:12

A. MR. MOLLARD: In the north.

A. MR. HALL: I believe it's in the north, subject to check. It's certainly not the case in southern jurisdictions.

Q. Right. Thank you. In the -- sorry.

THE CHAIR: I'm just mindful of the time. We did indicate that we were going to try to allow for a couple of breaks.

Before you get into your next question, perhaps we could take a short break and resume in seven minutes.

11:12

MR. MAISSAN: Sure. That's fine, Mr. Chair.

THE CHAIR: Thank you. So we'll briefly take a break and resume in seven minutes' time.

Actually, before we go, I'll just take this opportunity to indicate that the YEC opening comments,

we're receiving those as an exhibit, and they will be marked as Exhibit B-5.

EXHIBIT B-5 - YEC'S OPENING COMMENTS

(ADJOURNMENT)

THE CHAIR: Okay, we're ready to resume.

Mr. Maissan.

MR. MAISSAN: I'm ready to resume.

THE CHAIR: Okay.

Q. MR. MAISSAN: All right. The next part of these questions reference IR response to JM-YEC-1-32(a). And that's in regards to the various costs to diesel and LNG generation. 11:21

The response to part (b) says: (as read)

"The savings would approximate 1.5 cents per kilowatt hour of diesel generation avoided."

And these are consumable costs of, presumably, of oil filters, those kinds of things that I think are also mentioned in the GRA.

Now, I suppose -- I was surprised that there wasn't some inclusion of these avoided variable costs because, to me, they seem to be fairly certain, and I wonder why they were not included in the benefits. 11:22

A. MS. MILOJEVIC: We didn't view the cost savings as material from this element, so they were excluded from

the calculation for simplicity.

Q. Just for simplicity. Right. Okay.

In the application on page 12, there is a reference to Hatch estimating an improvement -- or potential improvement in efficiency in the hydro units of .5 to 1 percent, and I was wondering if Ms. Zuliani could tell us how confident Hatch is that there would be an improvement in operating efficiency.

A. MS. ZULIANI: So this was provided in the report as an example of how a modest efficiency gain could translate into additional generation from the same amount of water. 11:23

To actually estimate the efficiency, I would have to turn the question to my colleagues as it's based on the operation of their system and based on how they operate their hydro units.

Q. All right. Well, maybe we can ask -- I should ask Yukon Energy the same question, then.

It sounds as though there is a possible improvement in operating efficiency if we don't have to provide for operating reserve in hydro units. 11:24

Can somebody from Yukon Energy explain whether it's realistic to expect a modest increase such as that suggested?

A. MS. MILOJEVIC: Absolutely. We expect that, with

the battery on the system, the hydro operating units will be operated more efficiently. In other words, we will get more energy generated for the same volume of water, and that will produce savings over each year, so we do anticipate that.

As well as the potential to help with the protocols around mitigating downstream effects, especially at Aishihik, which again will help improve unit efficiency and result in savings.

Q. Right. So if we looked at the lowest number that Hatch estimates, which is equivalent to about 2.2 gigawatt hours a year, and if we assume incrementally that's all provided by LNG at the GRA costs of -- of 18.14 cents per kilowatt hour, that's almost $400,000 a year, and over 20 years, that's a cumulative 8 million. 11:25

So it seems to be a fairly significant number and, you know, it seems to me that that deserved to be included, and I wondered why it wasn't.

A. MS. MILOJEVIC: I think, in general, we tried to be conservative with our estimation of the benefits that BESS would provide, particularly with the efficiency gains. 11:25

It's very much dependent on the characteristics of your system at a given time, because it depends on where you would have had to operate the unit, if you

didn't have the BESS versus where you can operate it if you do, and that can vary minute by minute, hour by hour.

So while the 1.5 percent to 1 percent efficiency gain referenced by Hatch gives us an estimation, you know, we are less certain on the degree to which we can leverage that benefit over time, and it will vary year to year.

Given that uncertainty and our conservative approach, we excluded it from the benefit calculation. 11:26

Q. Right. But you are confident that there will be an improvement in operating efficiency?

A. MS. MILOJEVIC: Yes, we are.

Q. Thank you. There are various other benefits listed: Reactive power support, grid reliability, ancillary services, load loss stabilization, blackstart, and outage restoration capability.

Now, if I understand correctly, there is no monetary value applied to the -- or credited to the BESS for these expected services and improvements? 11:27

A. MR. HALL: Yeah, that's correct. We didn't ascribe any value to those benefits. That's not to say that we don't believe there is value. It's just, in this jurisdiction, you know, it's just really hard to value reliability, we haven't formally gone through

such a process, and it's difficult at best, but we do believe that these benefits are real and are of value to our customers.

Q. Right. And you believe they should be taken into consideration in making decisions on these projects -- on this project?

A. MR. HALL: Yes, absolutely.

Q. Thank you. We've already covered the last part of the question I had here in regards to the operating reserve, which provides, if I understood correctly, the bulk of the ratepayer benefits and they're quite substantial; and even -- anything above the one-third, if it was 40 percent instead of one-third, or 33 percent, or anything more than that, it seems to me that the financial benefits would be -- would be quite substantial and -- but we've already visited that. It's -- yeah. It sounds, indeed, overall a conservative approach. I guess that's more a comment than a question. 11:28

MR. MAISSAN: I really don't have any further questions, then, Mr. Chair. 11:29

THE CHAIR: Thank you, Mr. Maissan.

I think we had indicated that the order of questions would be alphabetical, and an oversight, I failed to ask ATCO if there are any questions for the

panel.

Is the ATCO counsel or representative online, available to speak, answer that?

MR. CULLINGHAM: Yeah, I'm here. No, we don't have any questions for the panel today.

THE CHAIR: Sorry, Mr. Cullingham; correct?

MR. CULLINGHAM: That's right.

THE CHAIR: Okay, thank you. I just wanted to clarify.

All right. So I understand that, if we're following the alphabetical order, Mr. McMahon, you're going to be questioning on behalf of the Utilities Consumers' Group? 11:30

MR. MCMAHON: Yes, I will.

THE CHAIR: Okay, great. It's 11:30. Just to be mindful of the time. We do want to break promptly at noon, so let's see if we can get through with this in half an hour, but if not, we'll have to call you back at 1:30 to finish.

So you can proceed. 11:30

MR. MCMAHON: Okay, thank you.

MR. MCMAHON CROSS-EXAMINES THE PANEL:

Q. My questions to the panel will be clarifications questions on responses to some of the IRs. So I'll start with the responses to the UCG IRs, if you want to

turn those up.

And the first question will be on UCG Question Number 1, which is UCG-YEC-1-1. And in response to this, Yukon Energy refused to share any information it may have provided to the Yukon government to allow them to designate this project as a regulated project.

And I just wanted to confirm whether Yukon Energy did provide the Yukon government with any information to help them make this designation?

MR. LANDRY: Mr. Chair, if I may, I apologize, Mr. McMahon, for objecting; but, again, there are a number of questions relating to this type of an issue which in a process like this where a Part 3 application is brought over to you, the Board, for review, issues of whether or not there were information or no information exchanged is not relevant to your consideration. 11:31

So this is a question that I would object to.

MR. MCMAHON: I can tell you that the reason why I asked, I just wanted to confirm whether all the information that the Yukon government had in order to make that designation has been included in the information provided to the Utilities Board. 11:32

MR. LANDRY: Well, sir, first of all, nobody on the panel, nor could I, speak on behalf of the

government.

And so, again, I would emphasize that the application that is before the Board and the nature in which that application arose would lead to the conclusion for something like this, that the question you've asked is not relevant.

THE CHAIR: Mr. McMahon, do you have a response to Mr. Landry's point, that your questions are not relevant in the circumstances?

MR. MCMAHON: The only response, as I just said, I just wanted to make sure that all the pertinent information that YEC had has already been provided to the Utilities Board. If that's the case, we can move on. 11:33

THE CHAIR: Okay -- sorry.

MS. SABO: Yeah, if I could just say that the terms of reference that the government gives us, Mr. McMahon, as part of its direction to us to commence a hearing on this, that terms of reference is really the document and the result of what we get from the government; and, you know, any -- to Mr. Landry's point, any communications that resulted of that happened before the issuance of that document. Really, it's the terms of reference we rely on, if that's helpful context to you. 11:33

MR. MCMAHON: Okay. Thank you.
THE CHAIR: Okay. So we'll just pause to allow the Board member to consider the point and the objection.
So our drill will be that we just go mute and...
(DISCUSSION OFF THE RECORD)
THE CHAIR: So, Mr. McMahon, the Board has decided to uphold Mr. Landry's objection.
As Ms. Sabo pointed out, that our jurisdiction today is essentially defined by the terms of reference, 11:35
subject, of course, to the Act, but what you're asking for really doesn't turn on the Board's jurisdiction as defined by the terms of reference.
So the objection is sustained, and you can proceed with your questions.
MR. MCMAHON: All right, thank you.
Q. Moving on to the Question Number 2, which is UCG-YEC-1-2, section (b), and this is where Yukon Energy has confirmed that the current price estimate for the proposed Battery Energy Storage System 11:36
is between 22.19 million and 41.21 million, and after the $16 1/2 million funding from the federal government, YEC states that the preliminary net capital cost for Yukon Energy is 15.2 million.
And my question is, based on the upper end of

41 million potential costs for this project, could Yukon Energy confirm that the net capital cost to be recovered from the Yukon ratepayers could be as high as nearly 25 million after the receipt of funding from the federal government?

A. MR. HALL: That's correct.

Q. Thank you. And is the 22 to 41 million dollar cost estimate, is that still the best estimate that Yukon Energy has?

A. MR. HALL: Yes. 11:37

Q. Now, going to part (f) of Question 2, this is where YEC confirmed that YUB must consider whether project costs are prudently incurred and reasonable before allowing them to be recovered from ratepayers.

So I wanted to find out, in Yukon Energy's opinion, should the YUB be looking at this as a potential $41 million project paid for by ratepayers and taxpayers or as a potential $25 million project paid for by ratepayers?

A. MR. MOLLARD: I think it's important at this 11:38
point, Mr. Chair, to highlight that the Board is not being asked to approve any amount in rates. The application and the supporting IRs that we provided and our testimony today highlights that we have an issue with our capacity in Yukon, we have an obligation to

meet that capacity requirement, and so this application clearly outlines what we feel are the options for meeting that capacity requirement, and so we're justifying it on the basis of the best -- the best alternative.

So we're not -- we're not really here today to talk about the ultimate impact on ratepayers; it's the selection of the best option for ratepayers among a suite of options.

Q. Yes, my question was more -- I understand that the Board has considered the alternative based on impacts to ratepayers. That's why I want to understand, is Yukon Energy thinking this is a $41 million project or it's just a $25 million project? 11:39

A. MR. HALL: Mr. McMahon, we presented a cost estimate with an accuracy range around it, which is appropriate for this level -- the stage at which the project is at.

I think in response to one of Mr. Maissan's questions, we discussed the fact that if you run the economic analysis on it, even with an escalation of that 30 percent, the project still delivers net benefits to ratepayers. 11:39

But to support Mr. Mollard's statement, we're not before this Board to ask approval for a final net

capital cost to be put into rates at this time. That will happen at a future proceeding.

Q. Okay, thank you. Going to part (h) of Question 2, Yukon Energy states that: (as read)

> "Detailed information regarding the costs and information contained in the application related to Northern Quebec and Northwest Territories projects isn't relevant to this application."

I'm just wondering what purpose these references had in Yukon Energy's application? 11:40

A. MR. HALL: Mr. Chair, I think in your opening statement you referred to some risks and concerns that the YUB had previously about battery technology, and one of them was its use in northern climates.

And so the reason for referring to these -- the Northwest Territories and Quebec installations was to address that question and illustrate that there is now significant operating experience of battery projects in northern climates. 11:41

Q. Okay, thank you. In part (i) of Question 2, Yukon Energy confirmed that the current rates don't recover any costs associated with the planning or commissioning of the project.

And can you just confirm that the current 2021 GRA

application doesn't include any recovery of costs related to this proposed project?

A. MR. MOLLARD: That's confirmed. It's Ed.

Q. Thank you. And do you have any idea when you might request a rate change to start recovering the costs of this project?

A. MR. MOLLARD: I can't say at this time.

Q. All right, thank you. Going to UCG Question 3, which is UCG-YEC-1-3 and part (a), YEC states that it's: (as read)

> "...proceeding with planning activities required to obtain authorizations and approvals prior to issuance of the certificates for the Battery Energy Storage System."

Can you tell me how much is currently expected to be spent on the project prior to the issuance of these two certificates? 11:42

A. MR. MOLLARD: Well, just a point of clarification, I believe the operations certificate doesn't actually come out until after the project is built. 11:42

But, Mr. Chair, I can confirm that, as of today, we're roughly $700,000 in accumulated spending on this project.

Q. Okay. And if an Energy Project Certificate is not issued, how would Yukon Energy recover the costs that are being incurred?

A. MR. MOLLARD: Depending on those -- well, we would be including those costs in a future proceeding for the Board to assess for prudency, and if they deemed it was prudent, it would be recovered from ratepayers at that time.

Q. Okay. Thank you. Going to UCG Question 4, and the response actually refers to YUB Question 47, which is YUB-YEC-1-47. And this is where Yukon Energy provided a copy of the transfer payment agreement between the Yukon government and Yukon Energy. 11:43

And according to Section 5.1 of the transfer of payment agreement, Yukon Energy is eligible for funding assistance not to exceed 16 1/2 million.

And according to Schedule B of the transfer of payment agreement, Yukon Energy must carry out the project in accordance with a $25 million budget.

Just for clarification, does this mean that Yukon Energy will qualify for $16 1/2 million in funding assistance if it spends at least 25 million on this project? 11:44

A. MR. MOLLARD: I want to be a bit careful in how I respond to this, Mr. Chair. The ability to recover

the funds is based more on the nature of the costs as opposed to the overall project amount. So there's certain items that are deemed eligible and certain items that are deemed ineligible.

Based on the estimate at the time of a $25 million project, we would get the 16 1/2 million. To the extent we spend more than that, we are still capped at $16 1/2 million in funding from the government.

Q. And is there a way that you would only qualify for less than 16 1/2 million? 11:45

A. MR. MOLLARD: Mr. Chair, based on what we know about the project right now, there's not a risk that we're not going to get that full funding.

Q. Thank you. Section 3 of the transfer payment agreement, it says: (as read)

"The Yukon Energy is required to use the financial assistance to carry out a Project that's described as:
The acquisition and installation of a 40-megawatt hour Battery Storage System 11:46
with an 8-megawatt capacity in accordance with the work plan."

Can you tell me where on this work plan that's included in Schedule A the current efforts to get the Energy Project Certificate is listed?

A. MR. MOLLARD: I'm sorry, Mr. McMahon, I missed that reference. Whereabouts are you in the agreement?

Q. Okay. In the appendix to Schedule A of the transfer agreement, there's a work plan schedule. It's a Gantt chart.

A. MR. MOLLARD: Oh, okay, we're there.

Q. Okay. Can you tell me where on this schedule the current Energy Project Certificate acquisition is located?

A. MR. MOLLARD: That's the requirement. 11:46

Sorry, Mr. McMahon, we're just trying to make sure we have the clear reference here.

MR. LANDRY: Just so there's a clear reference on the record, Mr. McMahon, is that page -- I think this is the right reference -- pdf 265 of 376? Is that the one?

MR. MCMAHON: I think that's right. You're looking at the combined document now?

MR. LANDRY: Yeah.

MR. MCMAHON: Yeah. If the panel wants to take 11:47 it away as an undertaking --

A. MR. HALL: I think I can answer this, Mr. Chair.

So if you look in the first part of the -- the Gantt chart is split over a couple of pages. So we see

under Assessment and Permitting, there's a specific line item that says "Confirm requirement for Part 3 energy certificate." So there was a recognition upfront that it was a possibility.

And then, you know, what I would note in the subsequent project execution, we very clearly show a stage gated approach, where -- and what that means is that we advance the project a certain -- to a certain milestone and then take it back to our Board for approval to proceed. 11:48

And so I think the implication was that, at the relevant stage gate, you know, the outcome of the Part 3 proceeding would be a piece of information that our Board would take into consideration in advancing the project further.

Q. Okay, thank you. Does the access to the 16 1/2 million in financial assistance, does it have any expiry date?

A. MR. MOLLARD: Subject to check, no.

Q. Okay, thank you. At Section 2 of the transfer of payment agreement, the project approval date is August 30th, 2019, and Schedule D -- or, sorry, Schedule G of the transfer agreement identifies ineligible expenses and states that: (as read) 11:49

"Costs incurred before the Project approval date and any and all expenditures

related to contracts signed prior to Project approval, except for expenditures associated with completing climate lens assessments are ineligible Project costs."

Can Yukon Energy identify any costs incurred or contracts signed prior to August 30th, 2019, related to this project?

A. MR. MOLLARD: Mr. Chair, I don't have -- I don't have specifics of how much was spent prior to that date. Subject to check, I want to say it was -- it was well less than half of what our spending today. So I would say approximately a quarter million dollars.

Q. Okay, thank you. And for this list of ineligible expenditures, is Yukon Energy planning to track these expenses separately for this project?

A. MR. MOLLARD: Yes, Mr. Chair, we are tracking these costs separately.

Q. Okay, thank you. And in the list of ineligible expenditures, it says: (as read)

"All capital costs, including site preparation and construction costs are ineligible until Canada has confirmed that environmental assessment and Aboriginal consultation obligations as required under Sections 11

11:50

11:51

(environmental assessment) and 12 (Aboriginal consultation) have been met and continue to be met."

Has the Canadian government confirmed that these conditions have been met yet?

A. **MR. HALL: Mr. Chair, I would point out that those environmental assessment and consultation obligations are typically assessed through the YESAB process, which we're in the middle of.**

And so, very clearly, we would not proceed with any of that site construction work until the YESAB has brought down -- written its report and the decision bodies have made their decisions, which then flow through to permitting. 11:51

So, you know, Mr. McMahon, we're not there yet. We're in the middle of the YESAB, and we presented information in our YESAB application on both environmental impact assessment and our consultation with the First Nations.

Q. Okay, thank you. In Section 6 of the transfer of payment agreement, Yukon Energy is required to submit to YDC, it looks like quarterly of each year, a financial report as laid out in Schedule F of the agreement. 11:52

And according to Section 8 of the transfer of

payment agreement, Yukon Energy must submit to YDC a quarterly project report and a final project report and provide data to demonstrate the community employment benefits of the project.

And my question is whether Yukon Energy will be submitting copies of these reports to the Utilities Board?

A. **MR. MOLLARD: We have not been requested to, and I don't believe that's a requirement for us to submit those to the Utilities Board.** 11:53

Q. Would it be acceptable to Yukon Energy to have that as a condition of the certificate recommendation?

A. **MR. MOLLARD: Sorry, Mr. Chair, that's not really my call. I think that goes to the terms of reference that the government has directed.**

Q. Okay, thank you. Moving to Question 5, this is UCG-YEC-1-5. This is where Yukon Energy has stated that it's rented temporary diesel units when necessary in order to address any dependable capacity shortfall forecasts in the last ten years. 11:53

Can you tell me how long you've actually used rented diesel units and generally what level of use?

A. **MR. MOLLARD: Mr. Chair, we first rented temporary diesel units, subject to check, winter '17/18, I believe we had 4 units that year, and then in**

the following year, I think we increased it to 6, and then 9 and then 17.

Q. Okay, thank you. And are there any operational concerns with the continued use of rented diesel fuel generators, or is your conclusion on their continued use just economic versus the proposed project?

A. **MR. HALL: Our choice of renting temporary diesels is -- you know, was an outcome of an assessment where we looked at the nature of our capacity gap and how long we expect that capacity gap to be around, given our future plans to bring other sources of capacity onto the system.** 11:55

And so given, you know, the temporary nature of that capacity gap, given our future plan, we had determined that, you know, it was an appropriate solution.

You know, operationally, we've been clear that we -- in this year, for example, are renting two additional units over and above what we believe is required to address, you know, the fact that the units aren't always available, so we have two spares, essentially, one in Faro and one in Whitehorse to anticipate that situation. 11:55

Q. Okay, thank you. Moving to UCG Question 10. This is UCG-YEC-1-10, part (g).

YEC states that: (as read)
"A Project agreement with each First Nation will determine the specific benefits to be provided for the Project, including consideration of any capacity funding if appropriate."

Can the panel tell me if any of these agreements have been put in place yet?

A. MR. HALL: Mr. Chair, we have made it clear that we have signed a term sheet with both First Nations, Kwanlin Dün and Ta'an Kwach'an Council, and are in the process of finalizing individual project agreements with both First Nations.

But the nature of the benefits contemplated is very much aligned with what was in the current term sheets.

Q. Thank you. And will the benefits outlined in these agreements be limited to the $100,000 First Nations benefits portion of the project budget outlined in Schedule B of the transfer of payment agreement? 11:56 11:57

A. MR. HALL: We're just finding the relevant section of the transfer payment agreement.

Q. It's Schedule B.

A. MR. HALL: I think for a number of reasons, it's clear that the budget in Table 2 of that schedule

is no longer current because it shows a total of 25 million, for example.

But in terms of the First Nations benefits, you know, those haven't been finalized yet. There's a component that will be linked, for example, to a procurement of the battery, for example, which we haven't yet procured, but I think it's reasonable to assume there would be, you know, higher than the 100,000.

Q. All right, thank you. 11:58

MR. MCMAHON: Mr. Chair, I see that 12 noon is approaching. I have about 15 minutes of questioning left, if you wanted to indulge me for that long.

THE CHAIR: No, Mr. McMahon. I think it would be better to hold the balance of your questions until we resume at 1:30.

MR. MCMAHON: All right, thank you.

THE CHAIR: So that being the case, since we're almost on the stroke of noon, we'll recess for lunch and resume at 1:30. Thank you. 11:59

(PROCEEDINGS ADJOURNED AT 12:00 P.M.)

PROCEEDINGS ADJOURNED TO 1:30 P.M.

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P.M. SESSION

(PROCEEDINGS RESUMED AT 1:36 P.M.)

THE CHAIR: Okay. Everybody is well-fed and rested for the rest of the afternoon.

So, Mr. McMahon, are you ready to pick up and carry on?

MR. MCMAHON: I am, thank you. 13:35

M. MILOJEVIC, A. HALL, E. MOLLARD, J. ZULIANI (For Yukon Energy Corporation), previously affirmed

MR. MCMAHON CROSS-EXAMINES THE PANEL:

Q. I just have a couple of more questions on the Yukon Energy responses to UCG IRs. If we could go to Question 15, and part (d).

Yukon Energy stated that it had: (as read)

"...resource planning and engineering staff that reviewed the utility battery 13:35 feasibility study report and provided professional assessments regarding its findings and implications for the Yukon integrated grid."

And I'm just wondering if any of the staff that provided

these assessments have any experience developing or operating battery energy storage systems?

THE CHAIR: Oh, I just wanted to mention, excuse me, for the benefit of the reporter would -- this may be directed to the YEC panel -- when you speak, please just state your name so that there will be no ambiguity for the reporter to record your response. Thank you.

A. MR. HALL: Andrew Hall, Yukon Energy.

In response to the question, no, I mean, none of our staff have operated batteries before. 13:36

Q. MR. MCMAHON: Okay, thank you. Going to Question 16 of UCG, UCG-YEC-1-16, part (c). And, actually, it's a reference to a response to a YUB question, YUB-YEC-1-46.

And there was an attachment there where Yukon Energy indicated that, between September 8th and 17th, 2020, it conducted five public meetings attended by a total of 43 members of the public with some people attending multiple meetings. 13:37

And I'm wondering if you can tell me how many individuals are actually included in that 43 number?

A. MS. MILOJEVIC: Mila Milojevic. We're not sure of the number of individuals. As for privacy issues, we don't collect names, so we can't determine whether

there might have been duplicates in attendance.

Q. Okay. I mean, there was a statement there that some people attended multiple meetings. So I was just trying to figure out if it was, you know, a total of ten people that attended all the meetings or was it actually 40 people and a couple of people attended the meetings more than once.

A. MS. MILOJEVIC: Again, it's Mila. I cannot say. I'm not sure how many people may have attended multiple meetings. 13:38

Q. Okay, thank you. And also in there, Yukon Energy stated that: (as read)

"There were 134 comments received either through email submitted online or gathered during door knocking."

Can you tell me what time period these comments were received?

A. MR. HALL: Andrew Hall, Yukon Energy.

Mr. Chair, we'll take an undertaking. We can't dig through the report live, so we'll get back with an undertaking. 13:39

Q. Thank you for that.

UNDERTAKING - REFERRING TO UCG-YEC-1-16, PART (C) AND/OR YUB-YEC-1-46, TO ADVISE WHAT TIME

PERIOD THE 134 COMMENTS WERE RECEIVED

Q. MR. MCMAHON: And I guess the supplemental question to that is, whether any of the comments that were submitted through email or online, were from participants at the community meetings as well, if you can tell me that.

A. MR. HALL: Andrew Hall. No, we can't tell. Because, as Ms. Milojevic outlined, we don't collect names. So, yeah, you can't tell.

Q. Okay, thank you. I want to move on to a couple of questions on the responses to Mr. Maissan's IRs. 13:39

And going to Question 1, which is JM-YEC-1-1, YEC stated that: (as read)

"ATCO Electric is supportive of the proposed interconnection group, but no formal agreement has been drafted."

And I'm wondering if there has been any agreement reached yet, or are there any formal letters stating this support?

A. MS. MILOJEVIC: -- Yukon Energy. We are still in discussions with ATCO Electric Yukon, and we don't have a formal agreement in place yet. 13:40

Q. Thank you. Going to Question 9, which is reference JM-YEC-1-9, part (a), Yukon Energy has stated that the Battery Energy Storage System has an expected use of a

life that would max out at 20 years.

My question is, does YEC plan to recover all the costs related to the system installation over 20 years?

A. MR. MOLLARD: It's Ed. Yes.

Q. Okay, thank you. Going to Question 21, which is reference JM-YEC-1-21, Yukon Energy stated that it is still exploring the option of using the Battery Energy Storage System for stabilizing hydro operations during periods of downstream winter ice formation and reducing downstream winter flooding. 13:41

And I wonder if you could provide an explanation as to how the proposed system could be used to mitigate downstream impacts at Aishihik, Mayo, and Whitehorse?

A. MR. HALL: Andrew Hall. I'll talk about the reference to Aishihik. So, typically, during the winter months, we can use Aishihik as the load-following plant, particularly their turbine. And, Mr. Chair, what that means is, as load varies, we'll vary generation using the Aishihik plant.

Now, what that means is that the flow downstream 13:42 **of the Aishihik generator varies as generation goes up and down.**

Now, one of the consequences of that is we -- there's been proposed and there's, you know, some debate about this, whether that then results in

unexpected ice formation buildup, an accumulation of ice, because you can imagine as the water level goes up and down, you can get ice forming, and which -- you know, has been, you know, postulated, has some negative environmental impacts.

So we have -- this is part of the relicensing project, so we've had some discussion with Champagne/Aishihik First Nation about measures to reduce the amount of variation.

And so one of the functions of the battery is that -- that peak shaving application that we talked to -- answered several questions about, which, in effect, would have the consequence of allowing us to run Aishihik much more steadily. 13:43

So that's the theory. But I think, you know, we've -- it's been proposed as one of the uses of the battery, and we certainly will be investigating that once we have the unit up and running.

Q. Okay, thank you. Moving to Question 22, which is JM-YEC-1-22, Yukon Energy stated that: (as read) 13:43

"A 50 percent contingency was applied on the large equipment purchases and construction, which represent the majority of the Project costs."

Are those contingency costs incorporated into the budget

numbers that were included in Schedule B of that transfer payment agreement?

A. MS. MILOJEVIC: Sorry, Mr. McMahon, can you remind me where the transfer payment is in the record? Where the agreement is in the record?

Q. Yes. Just a second. It is YUB-YEC-1-47, or at least the response to that.

A. MS. MILOJEVIC: It's Mila Milojevic, Yukon Energy. From what I see in the budget table, I do not believe a contingency was included. This budget was created prior to completion of Hatch's feasibility study, which the budget for which is what the project application is based on. 13:45

Q. Okay. Thank you for that.

Moving to Question 23, which is JM-YEC-1-23, Yukon Energy stated that: (as read)

"The 25-year site lease term includes one renewable option for an additional 25 years."

What I would like to understand is why Yukon Energy would agree to a 25-year site lease term with an extension provision if the expected useful life of the proposed system is only 20 years. 13:45

A. MR. MOLLARD: It's Ed. So a couple of things there. We feel it's prudent to -- well, number one, as

a utility, we don't ever abandon sites. We would typically renew sites based on the continued need for that generation, and we don't have any reason to believe today that we won't need that generation, so it was prudent to negotiate the deal on that basis.

And also 25 years also allows construction time. So we will be taking over that site this year for a facility that won't be in service for about a year as well. So it accounts for that as well.

Q. Okay, thank you. Going to Question 24, which is JM-YEC-1-24. Yukon Energy stated that it's: 13:46

> "...pursuing to replace some of the retired diesel engines with new diesel engines."

And I know that you spoke on this with Mr. Maissan earlier, but I'm wondering why Yukon Energy wouldn't consider replacing the rental diesel units with new diesel engines as part of this plant replacement plan.

A. **MR. HALL: It's Andrew Hall. As outlined in our 10-year renewable electricity plan, we have a portfolio of Projects that are planned over time to address the capacity gap that I referred to earlier.** 13:47

The focus of our board of directors -- and this flows directly from the policy direction that the federal government and the territorial government have

taken -- is to, where possible, focus on renewable sources of supply.

So, for example, we're working on the Atlin -- sourcing power from the Atlin Hydro expansion project, and then the big future project that would ultimately close the capacity gap is the Moon Lake pump storage project.

So we have a portfolio that's intended to address the capacity gap, and if you look at the needs over the next 10 to 15 years, you know, rental thermal makes sense if you're working on these other permanent solutions. 13:48

Our board of directors also made a very deliberate decision not to pursue a permanent solution, i.e. a permanent large new diesel plant; and, instead, you know, instructed us to focus on renewable projects such as Atlin and Moon Lake.

Q. Okay, thank you. Going to Question 28, which is JM-YEC-1-28, Yukon Energy stated that: (as read)

> "In 2021, it will initiate the design of a new portfolio of DSM programs with a capacity savings focused to manage peak loads." 13:48

I'm wondering if this has been done, and if it has, whether any details of those DSM portfolios and the cost

recovery be shared.

A. MS. MILOJEVIC: It has not been completed to date. It will take a few months to do program design. We're currently in designing for the procurement of support to develop that final program design.

Q. Okay, thank you. Going to Question 33, this is JM-YEC-1-33, and this is where Yukon Energy provided an update and a couple of scenarios for the Table 4.3 from the application.

And in part (a) to the response of Mr. Maissan's question, Yukon Energy updated Table 4.3 using what I'm assuming is the same assumed project costs along with more recent actual fuel prices. Is that right? 13:49

A. MS. MILOJEVIC: Mila Milojevic, Yukon Energy.

Yes, that's correct.

Q. Okay. And in part (d) to that question, you provided an update to Table 4.3 using project capital costs 30 percent above the estimate included in the application. Is that about 36 million? Or what number is that? 13:50

A. MS. MILOJEVIC: Mila Milojevic, Yukon Energy.

It would be $41.21 million, I believe, the 30 percent above what we estimated in the application.

Q. Okay. And this table that was provided in response to part (d), does that use the fuel prices assumed in the

application or the more current fuel prices?

A. MS. MILOJEVIC: Subject to check, I believe it uses the GRA fuel prices consistent with what was in Table 4.3 in the application.

Q. In the original application. Okay, thank you.

I just had a couple of follow-up questions to responses you had to some of the YUB questions.

And the first question is Question 1, it references YUB-YEC-1-1. This is where Yukon Energy stated that: (as read) 13:52

"The proposed Battery Energy Storage System is not considered to be a generation asset nor a transmission asset."

And early yesterday, I circulated Schedule 3A from Yukon Energy's 2021 GRA, which lists the categories of plant to which depreciation rates are applied.

And my question is, to which category of plant would the proposed Battery Energy Storage System be allocated? 13:52

A. MR. MOLLARD: It's Ed. Mr. Chair, there will need to be a new category created for the energy storage project.

This happened in the past when we had the LNG project and we had to bring LNG storage into our mix.

It was a new class of asset, and so it had to have its own category, and that's similar with this case.

We do not have any other energy storage on the system, so we'll have to create a new grouping.

Some of the peripheral equipment will be similar to what we have in other generation plants and substations, but the core of it, the energy equipment itself, will need a new class of assets.

Q. So, when we're looking at Schedule 3A of the depreciation categories, would it fit under the generation category or where would this new category end up? 13:53

A. MR. MOLLARD: It's Ed. It will stand on its own.

Q. Okay. Thank you. Going to Question 32 from the YUB. This is YUB-YEC-1-32, part (a), Yukon Energy stated that: (as read)

"It expects to rely on thermal generation for the foreseeable future at minimum as emergency back-up generation." 13:53

How many years is the "foreseeable future"? Is that 20 or 40 or 60?

A. MR. HALL: Andrew Hall, Yukon Energy. I think it's key to remember that the thermal fleet that

we have is an integral part of our solution to meet load under emergency conditions.

And, you know, I can't really anticipate, you know, us doing away with that thermal fleet, other than in the very long term. What I mean by that is beyond the useful life of the LNG plant, for example.

But, you know, the fact remains that, you know, we see thermal playing a role in our system for emergency back-up for that -- at least that sort of order of time. 13:54

Q. Okay, thank you. Moving to Question 38 from the YUB, this is YUB-YEC-1-38. In part (a) Yukon Energy stated that it: (as read)

"...engaged TransGrid to complete a review of energy storage technologies for the 2016 resource plan."

I wonder if you could provide a copy of that TransGrid review and the directions they have provided for the review?

A. MR. HALL: Andrew Hall. I believe the TransGrid study is part of the appendices to the 2016 resource plan, which should be available still on our website, but we can certainly provide a copy separately. 13:55

Q. It would be helpful to have it on the record of this

proceeding, I think.

A. MR. HALL: Yes.

Q. Thank you.

UNDERTAKING - TO PROVIDE A COPY OF THE TRANSGRID STUDY

Q. MR. MCMAHON: Going to Question 46. This is YUB-YEC-1-46, part (d), Yukon Energy stated that it: (as read)

> "...will continue to communicate with the public about how each concern raised during consultations has been mitigated and/or addressed as further engineering, procurement advances, and more detailed information is available on the particular resolution of each concern."

Could you provide an explanation of what communications have taken place to date and how these updates have and will be communicated to stakeholders? 13:56

A. MS. MILOJEVIC: Mila Milojevic, Yukon Energy. So as we complete different phases of the project, we'll issue public updates on the project. So on our website and social media, as well as any other release mechanisms that make sense. 13:56

So, as we enter into our next phase of design, that's when we'll issue updates on any changes to the

project.

Q. Okay, thank you. Going to Question 52, this is YUB-YEC-1-52, part (c) and (d). Yukon Energy stated that: (as read)

> "The proposed Battery Energy Storage System cost includes 20 percent overbuild and that the overbuild requirements will be confirmed during the procurement process based on specific vendor recommendation."

13:57

Is there a possibility that the vendors will recommend a lower or non-existent level of overbuild?

A. MS. MILOJEVIC: Yukon Energy, Mila Milojevic. There is a possibility they could recommend a lower overbuild than what we've estimated. We believe the estimate is reasonable based on a recommendation of Hatch and the study that they did.

Given that batteries degrade over time, Mr. Chair, I think we would expect that there will be some cost to ensure that we have the full amount of storage 13:58 **available for the 20-year lifetime. That's what the 20 percent estimate is meant to cover is what you need to overbuild in order to ensure that you have the full use at the project end of life.**

Q. Okay, thank you. Going to Question 55, this is

YUB-YEC-1-55, parts (b) and (c), Yukon Energy stated that: (as read)

> "Its management objective is to secure the lowest feasible costs for the required facilities and to enhance the annual savings from the Project to the extent that it is reasonably feasible."

How will the Utilities Board and stakeholders be informed that YEC's management have achieved those objectives? 13:58

A. MR. MOLLARD: It's Ed. Mr. Chair, the costs associated with this project, once it's placed in to be serviced, will be brought forward to the Utilities Board for consideration at a general rate application, where the Board and the interveners will have an opportunity to test the prudency of the costs that we're asking to be paid for, and that would be the normal process for a project of this nature.

Q. Okay, thank you. In part (g) to Question 55 Yukon Energy stated that: (as read) 13:59

> "It's not able to provide statistical estimates of probability for any variances in capital or operating costs related to the proposed Project."

And then states that: (as read)

"The probability of securing net cost savings for ratepayers over the life of the Project is very high."

And I'm trying to figure out how Yukon Energy cannot have probability for variances in costs, and yet be firm in cost savings to ratepayers.

A. **MS. MILOJEVIC: It's Mila. Yeah, so I think where we were stating that we couldn't provide statistical estimates of the probability of how the costs may vary, I think we've shown through the application and the IRs that, given we are (a) conservatively estimating, we believe, the benefits the battery will provide to ratepayers; and (b) that, even if the project costs do escalate by 30 percent as shown, they still result in a net ratepayer savings.**

So I think, regardless of the probability of cost variance referenced in the question, the point was that we believe it will result in net cost savings as it is not sensitive to the pricing in that regard.

14:00

Q. Okay, thank you.

14:00

MR. MCMAHON: Thanks to the panel for providing those responses. I appreciate that.

Mr. Chair, that wraps up my questioning. And I'm wondering if Schedule 3-A from Yukon Energy's 2021 GRA could be included as an exhibit in this proceeding?

THE CHAIR: Any comment on that?
MR. LANDRY: No objection, Mr. Chair. No objection.
MS. SABO: And I just want to clarify, Mr. Hall has agreed to that as an undertaking. So they'll do that as an undertaking, I believe.
A. MR. MOLLARD: Sorry, I don't think we had an undertaking on 3-A.
A. MR. HALL: It was on --
A. MR. MOLLARD: It was the TransGrid report. 14:01
A. MR. HALL: It was the TransGrid report and there's an undertaking around the analysis of the comments on public --
A. MR. HALL: Public consultation.
MR. LANDRY: Just so it's clear on the record, what I believe Mr. McMahon -- and he can correct me if I'm wrong -- is asking, is that, he had an aid to argument, Mr. Chair, which is the table I believe that he was referring to, and I think all that he was asking is that that table, which he did question the panel on, 14:02 could be put in as an exhibit, and we have no objection if that's what Mr. McMahon wants.
MR. MCMAHON: Yes. That was the table I was referring to.
THE CHAIR: Okay. Well, I mean, if it's

integrated into the cross-examination, then it should be made an exhibit.

Which exhibit number would that be?

MS. LEMKE: I think it's already been asked.

THE CHAIR: Oh, has it?

MS. LEMKE: It's C2-3.

THE CHAIR: Sorry. Okay, I don't have it on...

MS. SABO: Just to note, Mr. Chairman, I think Deana Lemke added it as C2-3... 14:02

THE CHAIR: I see it now.

MS. SABO: ...on the exhibit list already that's been circulated. So I think that's just confirmed that that's the document we're talking about.

THE CHAIR: The TransGrid report, is that supposed to be made an exhibit as well?

MR. LANDRY: If I may, Mr. Chair, just to help, the way I assume, subject to your direction, obviously, that we normally do it, when there's an undertaking that's put on the record, this will come back as an 14:03 undertaking; and as I recall, Ms. Sabo, when the undertaking comes back, I believe they form -- sorry, become an exhibit on the record. Do I have that right?

MS. SABO: That's correct, Mr. Landry.

THE CHAIR: Okay, thank you. I will take

guidance from those with more experience in this forum. So thank you for the clarification.

Okay. I think next on the list of cross-examiners would be Yukon Conservation Society?

MR. PRESSNAIL: I don't have any questions for the panel, for the record.

THE CHAIR: Thank you, Mr. Pressnail.

Mr. Landry, do you have anything just to tidy up in terms of issues arising from the cross-examination of the YEC panel? 14:04

MR. LANDRY: I think probably, sir, from my perspective, I'll wait to hear the cross-examination -- or the examination, I should say, of Board counsel and the Board, and maybe we can all do it in one small part at the very end.

THE CHAIR: Absolutely.

Ms. Sabo, are you ready to proceed, then?

MS. SABO: I'm ready to proceed, Mr. Chairman, but I wasn't sure when you want to take the afternoon break, so let me know when you would like me to stop. 14:04

THE CHAIR: Well, the afternoon session is a bit longer. Why don't we -- if you find a convenient spot to take a break from your perspective before 2:30, I'll leave it as your call, but let's say not go beyond

2:30.

MS. SABO: Thank you, Mr. Chairman.

MS. SABO QUESTIONS THE PANEL:

Q. Good afternoon to the panel and to Mr. Landry, and we appreciate you attending for questioning today.

I'm just going to let you know the reason why I keep reaching over my computer is I have this really lovely office where the sun tracks all day. So I'm trying to just to adjust my lighting so that I'm better seen. So my apologies if that's distracting. 14:05

I would like to start off today by just giving the panel a roadmap of where Board counsel is going to go with their questioning over the next day and a bit.

I will start today by asking just, Mr. Hall, if you can confirm some application details, and then what I'm going to do is I'm going to take the panel through the terms of reference, because I would like to hear from the panel how their application meets the terms of reference that the Board is discharged -- has to discharge to make a recommendation to the government 14:06 under Part 3. So that's what I'm going to do today.

And then I'm going to pass it over to Ms. Graham, my colleague, to go over any questions she has on the opening statement.

And then she's going to get into some questions on

sourcing for the project, costs, and the technical requirements of the project. So that's what she will be doing, as well as she'll get into some questions on N-1 and capacity.

Then the cross will move back to me, or the questioning will move back to me after that, and I'm going to get into more detail on the current cost projections for the project, any cost savings that are expected under the near and long term, and then I'm going to finalize it with the substantive issue of the debenture arrangement that is being made with the Kwanlin Dün First Nation and the Ta'an Kwach'an Council. 14:07

So that's our roadmap for the next several hours of cross-examination. Does that sound fine?

A. MR. HALL: Yeah.

Q. Okay. Thank you. I'd like to start with the reading in of a few short paragraphs on what I understand to be YEC's proposal for the BESS Project and its associated costs. 14:08

I will move through this slowly to ensure that you're with me, and then I'll ask you to confirm the accuracy of what YEC is applying for: (as read)

"Yukon Energy is requesting government approval under Part 3 of the *Public*

Utilities Act for energy Project and Energy Operation Certificates for a Battery Energy Storage System Project (or what we've been calling BESS) that it proposes to be located on undeveloped Kwanlin Dün First Nation, Category B, settlement land in Whitehorse. This Project is a containerized lithium ion battery energy storage system that provides 40 megawatt hours of energy storage intended to meet Yukon Energy's capacity requirements and will replace the need for four rented diesel generating units."

Are we okay so far?

A. MR. HALL: Andrew Hall, Yukon Energy. In general, yes. I would only comment that, when we state technical details like 40-megawatt hours, I mean, that's our design basis right now in its current state of design. There is a small chance that that number will change. I wouldn't expect it would change by much, but that reflects the project as we've defined it today, subject to refinements in final design.

Q. Okay, thank you for that addition, Mr. Hall.

And each diesel unit has 1.8 megawatts of

14:08

14:09

capacity, or that's the current estimate; yes?

A. MR. HALL: Andrew Hall. The diesel rentals, yes.

Q. Okay. And YE's position is that: (as read)

> "The BESS Project will displace 7.2 megawatt hours of thermal generation. The BESS Project will be connected to the Yukon Energy Whitehorse Rapids facility by a 34.5 kV transmission line."

14:10

And, again: (as read)

> "The BESS Project is expected to operate for approximately 20 years."

Is that all correct?

A. MR. HALL: Andrew Hall. Yes.

Q. YEC has noted that: (as read)

> "The primary purpose for the Project is to assist Yukon Energy in meeting its N-1 capacity reliability criterion and that the Project can provide additional benefits."

14:10

And you've listed some of those benefits in your application, and they've been discussed today, such as operating reserve; blackstart and outage restoration support; diesel peak shifting; frequency response

support; load loss stabilization; and reactive power support. Yes?

A. MR. HALL: Andrew Hall. Yes.

Q. Okay. Any other system benefits that aren't identified there that you can think of? Ms. Milojevic or anybody else?

A. MS. MILOJEVIC: Can you repeat the list, Ms. Sabo? Apologies.

Q. Sure. No problem. That's operating reserve; blackstart and outage registration support; diesel peak shifting; frequency response support; load loss stabilization; and reactive power support. 14:11

A. MS. MILOJEVIC: I would also add voltage regulation to that list. Thank you.

Q. Okay. And can you maybe give me a little bit of the technical detail on voltage regulation on how that would work?

A. MS. MILOJEVIC: Yes. So on our system, Mr. Chair, we have voltage requirements in terms of keeping the grid stable. You have a lower limit and a higher limit of the voltage that you need to have in different segments of the grid. 14:12

One of the features of a battery is that it can help manage the voltage, that you can keep within the regulated zone.

If you go outside of that zone, it can cause damage to equipment or safety issues. So it's a key part of grid reliability, and it's one of the features in the battery that we don't quantify savings with, but that provide us reliability and system benefit.

Q. Thanks, Ms. Milojevic.

Preliminary estimated capital cost using 2020 dollars for the BESS Project were identified in the application as 30 -- 31.7 million, rather, and include capital costs related to the projected equipment and installation costs, as well as Yukon Energy's estimates for planning and owner costs; yes? 14:13

A. MR. HALL: Andrew Hall. Yes.

Q. And the preliminary capital cost estimate for Yukon Energy after federal funding is 30. -- sorry, excuse me, 15.2 million. That's not changed to date, has it?

A. MR. HALL: Cannot be as cited (phonetic) is correct.

Q. Is there anything that you think I've missed on that summary that you think is integral to the application? I know that's a hard question to answer, but I'm really thinking, you know, is there anything high level that I've missed? 14:13

A. MR. HALL: Andrew Hall. I don't believe so.

Q. Okay, Mr. Hall, I would like to turn to the terms of reference, which have been marked as Exhibit A-2, and do you have a copy of those terms of reference, sir?

A. MR. HALL: Andrew Hall. Yes, I've got a copy in front of me.

Q. Thank you. So I would like to walk through specifically Section 3, which is entitled, "Specific aspects of the project to be reviewed." And that starts at the bottom of page 2, sir.

And as YEC's application does not specifically follow the terms of reference, I thought we could spend a bit of time this afternoon getting YEC's brief view on how those subcomponents in Section 3 and YEC's application are aligned. 14:14

So I'm going to have some questions for you on each of these, and take your time in responding.

So under (a), it states: (as read)

"The public need for the BESS 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 and the reliability of electricity service provided to customers." 14:15

So, given that term of reference, I understand that the BESS Project is expected to provide some longer term benefits, but how will it meet those near-term requirements related to non-industrial load?

A. **MR. HALL: Mr. Chair, the -- we've talked a lot about -- and in my opening statement focused on this quite specifically, is the function of this project to add 7 megawatts of dependable capacity to our system, and that happens as of the time that the unit is available and commissioned. So that is certainly near term.** 14:16

And it allows us for that winter to, you know, eliminate or avoid the need to rent four mobile diesel generators.

So, again, that talks about a very specific near-term benefit, which will then accrue every year after that in terms of avoiding that need to rent those four diesel units.

So I think the near-term requirement in terms of the capacity gap we have, and also the ability of the project starting in Year 1 to help address that problem has been addressed very clearly. 14:16

Q. And near the end of that part (a), it talks about the effect of the project on the rates of customers.

So can you comment on how -- what Yukon Energy's

position is on the expected impact to customer rates?

A. MR. HALL: Mr. Chair, as Mr. Mollard outlined in a prior response, we are not bringing this project to the Board to approve additions to rate base, and at that time, there would be a specific disclosure on potential impacts to rates.

I think the context here that we've -- and the approach we've taken is to compare the project costs to -- and the benefits compared to alternatives. So, in that sense, we presented a relative analysis compared to the available next-best alternatives.

Q. Okay. And I think that might be where attention exists, Mr. Hall, because, of course, we've got to make a recommendation to the government on impacts to rates, and, you know, I understand that project costs are a best estimate at this time, but that is something we have to address in our term of reference on what the expected cost impact is for the project.

So is it just that YEC is taking the best estimate it has from the Hatch report and that's what we should be solely looking at in terms of costs and rates? 14:17 14:18

A. MR. HALL: Mr. Chair, again, I think -- certainly based on my understanding and experience, the key issue when the Board evaluates a project such as this is (a) to validate that there's a need, which we

talked about a few minutes ago; and then (b) to evaluate the costs compared to the next best alternative.

Because the alternative of doing nothing, we would -- our position would be that's not really available. You know, the utility needs to make an investment to address this capacity, yeah, and so is this competitive versus the other alternatives that might be available to us.

So I think that's the lens through which we sort of reviewed this part of the terms of reference. 14:19

Q. Thank you, Mr. Hall. You know, I guess that the effect of the project would be the alternatives to succinctly summarize that response; correct?

A. MR. HALL: Yes, that would be a good way to look at it, yeah.

Q. Okay. You said this morning that it's hard to put a value or a dollar number on reliability, but that's the last portion of this term of reference of 3(a), that we have to look at the effect on reliability of electricity service provided to customers. 14:20

So I guess, for me, you know, reliability is one of those things that you have to balance that with costs; right? You could gold plate your system and try and make it overbuilt to make sure that everybody is

never going to get an outage, but, you know, on the flip side, you don't want to have regular blackouts and brownouts.

So can you maybe help me with some context on how you think the BESS Project will affect the reliability of service, electricity service, to your customers?

A. MR. HALL: Andrew Hall. I think it is important to note that it's -- it's -- the reliability here is all positive. In other words, it's a benefit to customers and to ratepayers. 14:21

So we presented information in the application around how the battery does that and the different technical ways in which it improves reliability.

What we haven't done is put a dollar value on that improvement in reliability, but I think we presented a robust and complete description of how it does that.

So, you know, I think we've met -- my view would be we've met the requirements in terms of demonstrating at least how the battery improves reliability for customers. 14:21

Q. Okay, thank you, Mr. Hall. I'm going to give you an opportunity to add anything after each of these sections. So I know we're beating the bushes a little bit, but is there anything else you would like to add in terms of point (a)?

A. MR. HALL: Mr. Chair, maybe just to go back to the beginning of Part 3(a), the public need, and just to emphasize that, you know, the primary use of the battery is to provide that dependable capacity, and I think we've certainly presented information that outlines where that capacity gap comes from, how it arose, and how the battery closes that gap.

So, you know, my view would be, in terms of justifying the public need, the application is complete in that respect. 14:22

Q. Thank you. I'm going to move to (b), which states: (as read)

"The capability of existing and currently committed and expected 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 BESS 14:23 Project on this capability."

First of all, can you briefly summarize for me how capacity of BESS is expected to help with existing generation?

A. MR. HALL: Mr. Chair, Andrew Hall.

A great example would be the conversation we had about improved efficiency of the hydro unit. So we talked about that at some length during this morning's session. So that's an example of how the battery would help the capability or enhance the capability of the existing assets.

Mr. Chair, in terms of looking at the wording of this clause (b), particularly, the final sentence around the effect of the BESS Project on this capability, my interpretation of that is that, when they talk about capability, it's the capability in general of our existing and, you know, committed assets to provide reliable power generation. 14:24

So it's not -- it's about everything together, how do we meet the future load. And, again, we've argued and presented clearly that the battery is a key part of that portfolio to close that capacity gap, that, if anything, is expected to increase over time.

Q. You took me to my next question, Mr. Hall. I was going to ask you, isn't it the total capacity of the system that matters in terms of part (b); right? That the BESS is part of that? 14:25

A. MR. HALL: Yes. I mean, the wording could -- you know, capability could be in reference to a particular asset or the whole portfolio together, yeah.

Q. And, you know, I might be belabouring this point, but, you know, the BESS battery storage project will only provide dependable capacity for committed generation during the winter months.

So can you help me with that value add versus kind of the overall planning of capacity and capability on the system?

A. MR. HALL: Andrew Hall. Mr. Chair, I think it's important to note that the battery brings -- adds capacity at all times of year, not just during the winter, but that when we look at our planning, the winter period is where our needs become most acute.

And so if we look at the ability to meet system peaks, those peaks occur during the winter. So we have a winter peaking system because it's a cold weather environment, so the winter is the period where the system is most pushed to meet its -- the needs of Yukoners.

14:26

Q. And the terms of reference talks about "YEC's capacity planning criteria." I didn't see that term used in the application.

14:26

So can you help me with what "YEC's capacity planning criteria" is, or what you think the government meant it is in this term of reference?

A. MR. HALL: Yes, Andrew Hall, Yukon Energy.

So, Mr. Chair, I'm sure you're taking a crash course in acronyms and jargon here, but you referred to in your opening remarks to the N-1 planning criterion. And so that, Mr. Chair, is what's being referred to here as the capacity planning criterion.

So it's terminology. It can be very confusing, but, basically, the N-1 speaks to the capability of the system to meet peak load during the coldest winter days if we lose our largest generator, which is the Aishihik facility or the transmission that connects it to Whitehorse. So that's what's called the "N-1 planning criterion." 14:27

Q. Maybe I got caught up on the singular versus plural there, Mr. Hall. Thank you very much.

Is there anything that you would like to add on part (b)? Or any of your fellow panel members? If you want to take a moment to think about that.

A. **MR. MOLLARD: Mr. Chair, it's Ed. I guess a less prevalent point there would be just the reliability of us owning a battery system versus rental diesels. I think, as we said, a couple of points, the rental units just aren't as reliable as we would like them to be, and the battery will fix that.** 14:28

Q. Okay. I don't see anybody else jumping in.

MS. SABO: Mr. Chairman, we are at break

time.

THE CHAIR: You know, I may have miscalculated a little bit. If we're going to take two breaks, why don't we give it another 15 minutes or so just to kind of even them out a bit before the end of the day.

Otherwise, I don't --

MS. SABO: Certainly. I'm happy to continue.

Q. Let's move to 3(c) of the terms of reference, which states: (as read)

"The risks for the BESS Project and their potential impacts on rates for customers and on the reliability of electricity service provided to customers." 14:29

I want to focus on that first part with the risks. Can you summarize the risks of undertaking the BESS Project, first of all, to YEC; and then, second of all, to its customers?

A. MR. HALL: Andrew Hall. I think we've discussed already risks in a couple of areas. 14:30

We talked at length this morning about the variability or uncertainty at this time in the capital costs. So the capital cost estimate is provided with a range of plus/minus 30 percent.

But then maybe to jump ahead to probably what's

the next question is, you know, we've also presented and discussed analyses which then evaluated the ratepayer benefits at the bookends of that risk range, and demonstrated that, even in that plus 30 percent capital cost scenario, there was still a net benefit to ratepayers. So that's one of the -- probably the principal financial risk at this time.

You know, obviously, there are technical risks associated with a battery, and those, you know, are addressed in a number of different ways through a competitive procurement process where the features of various suppliers, technology can be evaluated from a technical perspective.

And also just prudence and, you know, best-in-class engineering approaches as we finalize the detailed design of the plant.

Q. Thank you, Mr. Hall. I'm sure these things, you know, take a lot of thought.

How do your project management or your executive team look at, kind of, those -- the timing of these projects and those financial risks to come up with project proposals that are optimal in terms of timing and costs?

Like, I know you do your renewable plan, and those kind of things, but can you give me some context on,

14:31

14:31

you know, how do you actually decide when is the optimal timing and given the requirements to build the project and also the costs?

A. **MR. HALL: Andrew Hall. So you referred to the resource planning process, which is the foundational planning exercise that we undertake, which really looks at (a) defining the need, in other words, either a shortfall in capacity or energy, and that's based on forecasts of, you know, economic growth and load growth; and then looks to identify a particular** 14:32
projects and technologies to close -- to address those needs, close those gaps.

In terms of how we then time the project, that's driven by a fairly, you know, complicated analyses where we have to look at a couple of different factors.

The one would be, you know, what's the lead time or the delivery time of -- or development time of a project.

So, for example, Mr. Chair, you can appreciate a brand new greenfield hydro project could take you ten 14:33
years to build, and so it's not a very effective solution to address a short-term need.

Conversely, I would argue something like this battery is relatively fast. I mean, it's something that within a couple, three years you can develop,

design, and construct.

So you have to look at the -- how long it takes, how long the corporation to go through the regulatory process, the design process, engagements, environmental assessment, et cetera, to develop a project, and so that will drive how these projects sequence out in time.

And then, of course, you know, we also have to engage with our shareholder on availability of capital, you know, our 10-year renewable plan includes, you know, robust plans that require both federal funding and debt and equity, and our shareholder has a key role in terms of approving any debt requirements and equity that we may need. And so, you know, availability of financing is a third piece to the puzzle. 14:34

And a great example in this case was the Utilities Board -- so this Board in -- you know, in our last GRA, had concerns about the economics and pointed out that we needed to secure federal funding, and so we did so.

We went to work with the Yukon government to secure that AESO funding, and that again drove the timing by which we could move the project forward. 14:34

A. MR. MOLLARD: And, Mr. Chair, it's Ed.

If I could just offer -- this is a bit of a struggle for the utility to figure out on most of these

large projects in terms of -- particularly around permitting and how much work do you do before you bring it forward for review, because you run the risk of overcommitting the utility on a project you don't have approval to so that you have a really good number or you don't.

So, internally, the process that we use with our board of directors, which you've heard reference to a number of times, is this stage-gating process.

So the project team is required to identify within each of the major activities, whether they're project, engineering, consultations, permitting, First Nations relations, they have to identify for each of those items where they're going to get to in a stage gate. 14:35

And so that the Board is periodically checking in and making sure that everything is moving along at a pace and they can say, "Okay, well, I'm not worried about, you know, I have my permits or I have my engineering to a point now where I can go get a permit." 14:36

So it's how we lay out the project and how the Board oversees that project as it moves forward.

Q. Thank you, Mr. Mollard. That's helpful.

You know, at a very high level, I was -- when I was reviewing this and the 10-year long term -- or

renewable plan, that was a question I had, like, why wouldn't you do Atlin first or Moon first versus BESS first. So that's why I'm asking about project planning and priorities.

So if anyone else wants to comment on that, please do.

A. MR. HALL: Yeah, maybe just to illuminate on the examples that you raised there.

You know, in terms of a capacity solution, you know, Atlin, we're certainly trying to move that forward as fast as possible, but to Mr. Mollard's point, the project has to be permitted in British Columbia, and we have a significant requirement to raise federal funding for that project.

So, you know, there are certain projects we try to move forward as fast as possible, but there are practical realities that will drive timelines.

Q. Okay, thank you. I'm going to move to part (d), and we've already talked about reasonable alternatives to BESS, and that this is, in YEC's view, the alternative, the proposal is the alternative in the sense that it's the recommended option. So I'm not going to go into too much more detail on that.

But I do have a question on the BESS with the:

(as read)

14:36

14:37

"...selected technology might be advisable given the reasonable load assumptions and risk assessments."

So the second half of part (d) of that question. So -- sorry, of that term of reference.

So given that this project will be based on containerized lithium ion batteries of one of three types, is there any comments that you can make on the status of selecting that technology, given the last half of that statement? So the reasonable load assumptions and risk assessments required. 14:38

A. MR. HALL: Andrew Hall. Again, I think it's a little bit of interpretation of the wording here.

The way I read that is we certainly, you know, look to the alternative ways of undertaking the BESS Project.

So there is a discussion on different sizing alternatives, for example, that are -- you know, there's a fairly robust discussion of that in the application. 14:39

In terms of the selected technology, you know, there is -- our position is that the lithium ion chemistry is the one that's most proven in the industry, it has the best track record, including track record in northern cold climate applications. And,

again, that speaks to the concern that the Board had raised in its prior, you know, communications to us around the project.

In terms of the wording around the advisability "...given reasonable load assumptions and risk assessments," I think that really speaks to the first part of the sentence, which is the alternatives.

So does a BESS make sense compared to the alternatives, given what we see in front of us in terms of load growth, et cetera. That's how I interpret that question. 14:40

Q. Thank you, Mr. Hall. And I know, Ms. Milojevic, you had said this morning that the vendor process is underway and there's two stages.

Have you gotten any preliminary indication on which of the three types of batteries is -- lithium ion batteries are going to be optimal for this project or is that still unknown?

A. MS. MILOJEVIC: That's part of the process that we're in right now, actually, Mr. Chair, is to speak with the vendors who have passed through Stage 1 and weigh the pros, cons, risks, features of the different available technologies so that we have more information on which to evaluate, what technologies are available. 14:40

So, you know, all three have different pros and

cons per se, and so we are just learning more information as that market is evolving very rapidly, as you can imagine, it's a very popular technology right now, so lots of change.

So the current information from the vendors who are participating in our competitive process will help inform us in terms of what the options are and what risks or features we can be weighing in our decision.

Q. Okay. Anybody else want to weigh in on (d) before I move to the next term of reference? 14:41

Okay. Part (e) says: (as read)

"Impacts on YEC and ratepayers of the debenture investment opportunity that YEC is providing to TKC and KDFN in recognition of the BESS Project's location on the overlapping Traditional Territory of TKC and KDFN and the benefits of TKC and KDFN support for this Project's development at this time." 14:42

I'm going to leave most of that term of reference because I've got a -- I'm going to have detailed questions on the debenture investment tomorrow, but I'm wondering, at a high level, what does YEC see are the benefits to YEC as a result of the support of the two

Indigenous groups for this project?

A. MR. HALL: Mr. Chair, I think it's important in answering the question just to recognize the general environment that we are operating in with respect to Indigenous rights, and a real effort on behalf of, not only the federal government, but the territorial government as well, to uplift Indigenous communities and, really, what that flows down to is a very deliberate strategy on behalf of our board of directors to make economic benefit opportunities available to the relevant First Nations associated with the major projects that we undertake. 14:43

So it's a very strategic initiative on our part. And, you know, the question is, well, what's the benefit to YEC?

Well, I think, you know, there are a number of benefits. The one, in very simple terms, is, of course, we -- we ultimately wish to secure the support of the First Nation on these projects because, you know, if we don't secure that support, in some cases, that could mean that we are not successful in proceeding through the YESAB process, for example. 14:43

You know, also, in this case, we wanted to -- we had a specific intent to situate the project on First Nation settlement land.

So, implicit in that, is, you know, the First Nation supporting the project because it is unlikely that they would make that land available if there was a fundamental lack of support.

So -- and then more broadly than that, I think as a corporation, as a Crown corporation, we do have an objective of contributing and helping with that general economic betterment of Indigenous communities, and so that is of benefit financially we believe in the long term. 14:44

Q. Okay, Mr. Hall. Do you see those benefits being the same, the benefits of Indigenous support, would those benefits you mentioned be the same benefits that customers would get from this project? Or do you see the customer benefits as being different?

A. **MR. HALL: Mr. Chair, I'm not quite sure, you know, the words "the same" and "different." I think there's benefits to both.**

I mean, we've shown very clearly in that net present value analysis that there is a net ratepayer benefit to ratepayers compared to the next-best alternative, and that stands separate and apart from any benefit that the First Nations may receive. 14:45

Of course, you know, First Nation citizens are also ratepayers in many cases, so it's sometimes hard

to differentiate, but I don't see them as being in any way in conflict, and I think they both, you know, at least financially receive benefits that we've quantified.

A. MR. MOLLARD: Yeah, Mr. Chair, if I could add, it's Ed.

From our perspective, we believe the way we've structured this debenture as a benefit to the First Nations, ratepayers will be indifferent. We don't -- we don't feel that engaging in this debenture agreement will harm or benefit ratepayers, just specific to that instrument. 14:46

MS. SABO: Mr. Chairman, I'm noting our time, and I actually only have a few more questions in this area. So if it would be okay, I think we only need about five minutes more before we break.

THE CHAIR: Let's keep on that theme until you're done.

MS. SABO: Thank you.

Q. So just on 3(e), is there anything else, Mr. Mollard, you added, anything else from the panel that's front of mind on the impacts to ratepayers and the use of a debenture investment for this project? 14:46

A. MR. HALL: No.

Q. Okay. And moving to (f), we've got: (as read)

"Whether it is prudent to build the BESS Project as proposed at this time."

Mr. Hall, we just finished talking about that, but I'm just going to ask one more pointed question.

Can you comment on why YEC sees that it's reasonable to proceed with this project now rather than a year from now or two years from now?

A. MR. HALL: Andrew Hall. Mr. Chair, I think a couple of reasons. Firstly, we've secured the government funding already, it's available, you know, it's ready to be drawn down, the time is right from that perspective. There wouldn't be any reason to delay spending on government funding that's already been announced and allocated.

Secondly, I think we've demonstrated that the need exists today. So if you think about the primary benefit of this battery in terms of avoiding us renting four diesel units, we're renting today, so that need is current.

14:47

And, secondly, you know, we've presented a ratepayer benefit calculation, and those benefits accrue from year 1. So, really, from a -- if you think about it, you know, flowing those benefits to ratepayers, they start in year 1 and, therefore, again, I would say there's no point in really delaying because

14:48

you get those benefits starting in year 1.

Q. Has YEC done any cost analysis or sensitivity analysis if there were a year project delay for this project?

A. MR. HALL: Mr. Chair, no, we have not.

MS. SABO: Okay, those were my questions on the terms of reference. I'll give the panel members one more opportunity if there's anything else you would like to note on what we've discussed.

Otherwise, Mr. Chairman, those are my questions. And Ms. Graham will pick up after the break. 14:49

THE CHAIR: Okay.

MS. SABO: I don't see anybody jumping up, so I think we can break.

THE CHAIR: Very good, okay. Let's take a ten-minute break.

A. MS. MILOJEVIC: Mr. Chair, if I could, we'll seek Ms. Lemke to re-let us in or repromote us to panelists. We're going to have to restart the computer in this boardroom here. It's giving us an IT message, so we'll log out and log back in. 14:49

THE CHAIR: Okay. Good old technology.

A. MS. MILOJEVIC: Thank you.

(ADJOURNMENT)

THE CHAIR: Ms. Graham, are you ready to go?

MS. GRAHAM: I am. Donna, are you able to hear

me okay?

THE COURT REPORTER: I can. Thank you, Jaimie.

MS. GRAHAM QUESTIONS THE PANEL:

Q. Good afternoon, panel, and everyone listening in today. I'd like to start with some questions about YEC's opening statement. If you can open to pdf page 3, hard copy page 2. In the fourth paragraph, YEC states: (as read)

> "YEC's 2021 GRA shows this forecast N-1 capacity shortfall at 26.4 megawatts for 2021/22, requiring 15 diesel rental units (plus two spares to support these units). Without new resources beyond committed and planned DSM and the Whitehorse Number 2 uprate, YEC's 10-Year Renewable Electricity Plan forecast shows this shortfall increasing to 39.9 megawatts in 2025/26 and 61.2 megawatts in 2030/31."

15:08

Can YEC confirm it is currently meeting its forecast of N-1 capacity reliability criterion with these rented diesels?

15:09

A. MR. HALL: Andrew Hall. Yes, we are.

Q. And turning to pdf page 4, hard copy page 3, in the first paragraph on that page, in the last sentence, it

says: (as read)

"The proposed BESS Project is consistent with, and complements, Yukon Energy's longer-term plans to reduce the remaining rented diesel use over the next decade through Demand Side Management, uprates to existing hydro units, Atlin Hydro, and Moon Lake Pumped Storage."

In the quote I just read, YEC references "Demand Side Management." Would you agree generally that DSM uses planning and management to change the utility's load shape? 15:10

A. MS. MILOJEVIC: Mila Milojevic. Generally, yes, the programs can use planning and management or direct utility control to adjust the peak load down.

Q. And would you also agree that load shape or causing reduced consumption either reduces or defers the requirement for new generation assets?

A. MS. MILOJEVIC: Yes, that's correct. 15:10

Q. And my final DSM question, would you agree generally that on a unit of measure basis, such as megawatts, if the cost of the DSM action is less than the cost of the incremental generation capacity, then the DSM action is preferable to incremental generation capacity?

A. MS. MILOJEVIC: Yes. It's a metric that's equivalent. That's correct, yes.

Q. All right. Staying in the opening statement, if you could turn to pdf page 6, hard copy page 5.

And in the first paragraph YEC states: (as read)

"Yukon Energy plans to develop the BESS Project using technology with operational installations in Northern Quebec, the Northwest Territories, and Alaska. Lithium ion is a proven, safe technology for use in our Northern climate."

15:11

So what specific operational installations in Northern Quebec, Northwest Territories, and Alaska is YEC referring to?

A. MR. HALL: Mr. Chair, if I could ask Ms. Zuliani to speak to this because Hatch has significant experience with these projects.

A. MS. ZULIANI: Yes. So, right now, to our knowledge, there is at least two lithium ion battery projects in Northern Quebec, one in Quaqtaq, a northern First Nation community in the region, and one at the Raglan mine.

15:12

Similarly, there is a project in Colville Lake First Nation in the Northwest Territories, as well as

ongoing developments for the Inuvik microgrid, which is in progress at this time, which will include a lithium ion battery.

In Alaska, there's several battery projects, the oldest being the Kotzebue microgrid project, which again integrates lithium ion batteries with renewables for a remote community; as well as the Cordova, Alaska project, again, integrating lithium ion battery into the grid there.

Q. And what are the size of these installations relative to the BESS Project? 15:13

A. MS. ZULIANI: So the Quaqtaq project is 600 kilowatts/600 kilowatt-hours; the Raglan Mine project is 3 megawatts/1.5 megawatt-hours; the Colville Lake project is 200 kilowatts; the Kotzebue project is 1.2 megawatts/950 kilowatt-hours; and the Cordova project is 1 megawatt/1 megawatt-hour.

However, we would note that the technology is relatively similar, as they are containerized systems, so we expect a similar design in the system at 1 megawatt scale as is the 20 megawatt scale. 15:13

Q. Do these installations have a similar function as the BESS Project?

A. MS. ZULIANI: They all will have different functions, depending on the needs of the local grid.

They are primarily used in remote First Nation communities, so they are used to support renewable integration.

That being said, ramp-rate control and frequency regulation is a part of renewable integration in controlling the variability of that renewable, as well as providing operating reserve to cover off if the renewable drops off in a very short period of time until a diesel engine can be ramped up online.

These communities don't always have an N-1 criteria or they -- it is in the control of the utility as opposed to the community developing the project. 15:14

Q. Do you know what specific battery chemistries are used for these projects?

A. MS. ZULIANI: That information is not public.

Q. Okay. I'm going to leave the opening statement, and my remaining questions, I believe save one, are based on evidence in the application or in YEC's IR responses to the Board.

So my first set of questions concern the generating units that will charge the BESS. 15:15

If you could open to Board IRs, pdf page 116, of the consolidated version, IR Response YUB-YEC-1-1, sub (c)?

MR. LANDRY: Ms. Graham, what was the

pdf number on that?

MS. GRAHAM: 1-1, sub (c).

MR. LANDRY: And pdf page?

MS. GRAHAM: 116.

MR. LANDRY: Thank you.

Q. MS. GRAHAM: I prepared using the separated documents. So, hopefully, my -- I was frantically trying to get the consolidated version today, so hopefully they're correct.

So, in this IR, the Board asked if YEC expected the Whitehorse Rapids facility to be the only generating source for charging the BESS. 15:16

And the first paragraph of YEC's response, YEC stated: (as read)

"No, the BESS will be charged with energy available on the grid at the time. YEC intends that the BESS asset will be charged by surplus hydro whenever feasible due to the obvious cost advantage. However, there are circumstances where other sources of generation will serve this function." 15:16

And it goes on.

And then the last paragraph of the response, YEC added: (as read)

"Although the Whitehorse Rapids hydro may be the primary renewable energy source for charging the BESS, other YEC hydro generation, as well as independent power producer (or IPP) renewable generation will be used when available and required. Thermal generation charging for the BESS is likely to be provided by the Whitehorse thermal facilities, but if required, other thermal facilities will be utilized."

So, in summary, YEC's response is that the BESS will be charged by generation at the Whitehorse Rapids facility and other generation sources when required; right?

15:17

A. **MR. HALL: Mr. Chair, I think it's important to note that we have a single electrically connected system.**

So it's very hard to identify where an electron came from, and, therefore, you know, to specifically say that the BESS is going to be recharged using a specific type of generation is a tricky -- a tricky concept.

15:17

I think, you know, if you're looking at where incremental load comes from, it's a bit easier.

So, if at night, if we're recharging at night, you

know, we would look at that particular evening and say, well, where could we increase our output to recharge the battery.

And so I think that's the way to look at it, is to -- in a general sense. But, you know, to specifically target a specific generator is problematic, in our view.

Q. Okay, so my next question was, if you could approximate the percentage of time only the Whitehorse generation facilities would be charging the BESS, but based on your answer that's not something you would be able to provide? 15:18

A. MS. MILOJEVIC: It's Mila. No, it will depend on the system constraints and situation at the time.

So when you've got a number of units, hydro and thermal, with different operating restrictions, Mr. Chair, given, you know, it could be a certain time of year where a unit has to be at a certain output or ramped down or ramped up. So it really depends on the circumstance and which, you know, if that overlaps the time when you've been discharging and charging the battery, for example, to provide peak shifting. 15:19

So, you know, in general, I think we've estimated for the peak-shifting case, it would be recharged 75 percent with LNG facilities and 25 percent with

hydro, but certainly can't estimate which specific units as it really is dependent on the circumstances at the time.

Q. Could you please turn to pdf page 188 of the same document, which is IR responses to the Board.

This is the greenhouse gas mitigation assessment prepared by Golder Associates and provided as Attachment 1-22, sub (b). It's hard copy page 7 of 23 of the Golder report, if that helps.

And you should see on that page a header called "1.2, Project Description." Yes? Okay. 15:20

In the middle of the first paragraph, Golder stated that: (as read)

"The BESS will store power generation from existing hydro, diesel and LNG engines at the Whitehorse facility. However, in mid-2023 YEC anticipates that a wind farm will be commissioned at the Whitehorse Facility, the wind farm will also be a source of power for the BESS." 15:20

Can you clarify what role the commissioning of the wind farm at the Whitehorse facility will have on the source of power for the BESS compared to alternative sources such as the IPP renewable generation?

A. MR. HALL: Mr. Chair, I think it's important to note -- and I'll just check on what the date of this Golder report is.

A. MS. MILOJEVIC: August 2019.

A. MR. HALL: August 2019. You know, so some time has gone by since this was prepared, but I'm guessing that when they talk about that wind project, they were referring to an IPP project.

I mean, we do have a prospective IPP project on Haeckel Hill that would be wind. It could be that that's what they were referring to, because we certainly don't have any other plans to build wind at the Whitehorse facility. 15:21

Q. And returning to pdf page 116 of the same document, which is IR Response 1-1, sub (c). In the first paragraph YEC indicated that: (as read)

> "...the BESS asset will be charged by surplus hydro whenever feasible due to the obvious cost advantage."

So this means there will be an increase in costs when the BESS is charged by resources other than surplus hydro; is that right? 15:22

A. MS. MILOJEVIC: So where hydro is our lowest cost form of generation, yes, it has the largest cost advantage to be used for charging the battery.

Q. And is the increase in costs, when the BESS is being charged by surplus hydro as compared to other types of generation, contemplated in the BESS Project's overall costs?

A. MS. MILOJEVIC: Yes, recharging costs, including the generation to that recharging is included in the costs used in the application.

Q. I'm going to move to some questions about emissions. If you could turn to pdf page 190, again, of the same document, and that should be hard copy 9 of 23 of the Golder assessment. 15:23

It's attachment to IR response to the Board 1-22(b). Under the heading "2.3 Data Collection and Calculation Procedures," Golder stated that: (as read)

"In both the Baseline and Project case, grid power from the Whitehorse Facility will be supplied throughout the Project life from 2019 to 2043."

And then in pdf page 197 of that document, which is hard copy 16 of 23, Golder determined a GHG emission value of 606,736 tons. And that number is found in Table 9 of the assessment in the top right-hand corner. 15:23

Was this projected emission value assuming only a subset of generation sources? And I know we just talked about electrons, but was it limited in any way to

facilities -- certain facilities at the Whitehorse facility or did it look at all of the sources available on the grid?

A. MS. MILOJEVIC: If we could, Mr. Chair, we'd like to take an undertaking to respond to that. I don't think we can dig out that response live here.

Q. That's fine.

UNDERTAKING - REFERRING TO CONSOLIDATED IR RESPONSES, PDF PAGE 197, TO ADVISE WHETHER THE PROJECTED GHG EMISSION VALUE OF 606,736 TONS WAS ASSUMING ONLY A SUBSET OF GENERATION SOURCES, OR WAS IT LIMITED IN ANY WAY TO CERTAIN FACILITIES AT THE WHITEHORSE FACILITY OR DID IT LOOK AT ALL OF THE SOURCES AVAILABLE ON THE GRID

15:24

Q. MS. GRAHAM: And I have a follow-up question to that, which was, given that BESS will be charged by energy sources additional to the Whitehorse Rapids facility, and if Golder only accounted for energy sources at Whitehorse Rapids facility, I'm interested in whether the emissions, GHG emissions, reported in that table would materially vary or not if the scope of the sources of power in the Golder report were expanded.

15:24

A. MR. HALL: Mr. Chair, we'll add that to the undertaking as well.

Q. Thank you.

UNDERTAKING - REFERRING TO THE PREVIOUS UNDERTAKING, TO ADVISE WHETHER GHG EMISSIONS REPORTED IN TABLE 9 WOULD MATERIALLY VARY OR NOT IF THE SCOPE OF THE SOURCES OF POWER IN THE GOLDER REPORT WERE EXPANDED

Q. MS. GRAHAM: My next questions concern battery charging. If you could stay in the IR response to the Board and turn to pdf page 163, this is IR Response 1-19, and I'm looking at part (c). 15:25

So in this response YEC states: (as read)

"Under normal operation, if the BESS is discharged it will be recharged during the night or by another event (e.g., loss of load or increase in variable renewable energy). The frequency for recharge under normal operations cannot be usefully estimated at this time, given the range of possible uses and likely variance during different seasons." 15:25

Will YEC interrupt load in order to charge BESS?

A. MS. MILOJEVIC: No.
Q. If BESS is fully discharged -- and can I just start, what does it mean by "fully discharged" or "fully discharge"? What do those terms mean?
A. MS. MILOJEVIC: If you think about the battery like a gas tank, when it's fully charged, it would be full, and when it's fully discharged, it would be empty, as in there's no energy left stored, and it needs to be recharged before you can discharge from it.
Q. Can the BESS be fully charged during the night -- 15:26
sorry, I'll step back.

If the BESS is fully discharged, can it be fully charged during the night for the next morning peak?
A. MS. MILOJEVIC: Yes. So the Hatch analysis done would have been looking at that ability to have enough power to charge the battery fully during night if we're in a full peak, so the maximum amount of output fully discharged during the peak in the day and the evening, and then recharging overnight, yes, it will be able to be fully charged overnight. 15:27
Q. And staying in the same document, if you could turn to pdf page 476, which is IR Response 1-62.

In response to a question regarding recharging overnight, YEC referenced the Hatch report and stated, starting in the second sentence, quote: (as read)

"The minimum recharging power is shown for each scenario. In all cases, the BESS can be recharged overnight at less than the firm capacity and within the allocated period."

End quote.

What does "at less than capacity firm" mean in this context?

A. MS. MILOJEVIC: Subject to check, I believe it means that the charging rate is not to the maximum. So you can charge it less than the full ability of the battery's charge rate. 15:28

A. MS. ZULIANI: Mila -- or, Ms. Milojevic, maybe I can provide clarity there.

It's less than the firm capacity, so 7.2 megawatts in this case. So we would be recharging it at a rate less than that.

Q. I'm going to move to the issue of storage for intermittent renewable generation. Again, staying in the same document, if you could turn to pdf page 117, which is IR Response 1-1, sub (f) and (g). 15:28

According to the IR response, the table on the following page includes key policy changes or requirements from the "Our Clean Energy Future Strategy" that YEC identified as expected to impact

YEC.

And then on pdf page 118, there's a table, and action E8, YEC stated: (as read)

"Increase the limit of the Standing Offer Program under the Independent Power Production Policy from 20 gigawatt hours (GWh) to 40 GWh by 2021 to support additional community-based renewable energy projects on Yukon's main electrical grid." 15:29

And in Action E10: (as read)

"Continue to deliver the Micro-generation Program in collaboration with Yukon's public utilities, targeting 7 megawatts (MW) of installed renewable electricity capacity by 2023."

So I understand that YEC anticipates that more renewable generation, such as wind and solar, will be incorporated on the system due to the Independent Power Producer 15:30 Standing Offer Program, and that wind and solar are intermittent sources of generation.

Does YEC know if energy suppliers under E8 and E10 will be providing smoothing batteries, which I understand to mean batteries that smooth power

fluctuations on the system, as part of their projects?

A. MR. HALL: Andrew Hall. We don't believe there are any projects that are planning to include storage.

Q. So I would like to move to the issue of project drivers.

If you can stay again in the IR responses to the Board, pdf page 116, IR Response 1-1, sub (c).

And YEC summarizes the drivers for the BESS Project in the enumerated list on the page. 15:30

So YEC has identified the primary driver to be the N-1 capacity criterion.

Can you walk me through how YEC determined how much weight to attribute to each of the three use scenarios, starting with N-1?

A. MR. HALL: Mr. Chair, I'm not sure that it's a question of allocating weighting. The N-1 criteria defines a need that we have to meet. Namely, that we have a capacity shortfall, and as I outlined in my opening oral statements today, we meet that need 15:31 **through mobile rental generators, but as the utility, we're always looking for permanent solutions that are more reliable or can confer a ratepayer benefit.**

So then -- you know, once we've established the need, the next step is, you know, is there a business

case compared to the status quo, and so that's where the operating reserve analysis came from, namely, that by -- you know, as we've demonstrated, for example, in Table 4.3 of the application, you can demonstrate a strong ratepayer savings through operating reserve.

So I don't think it was a question of prioritizing -- you know, N-1 established the need. Operating reserve really provided, as Ms. Milojevic outlined, a fairly conservative, in our view, business justification for the project. 15:32

MS. GRAHAM: And, Mr. Chair, I was remiss in asking or checking today when you would like the break. Would it make sense to have the break in 15 minutes? Or is there another time that works best for you?

THE CHAIR: That will leave us one hour for the home stretch.

MS. GRAHAM: Okay. So I'll keep track of time and circle back in 15 minutes.

Q. I'm going to ask some questions, panel, specific to N-1. If you could open to the application, pdf page 11 or page 7. 15:33

Footnote 4 states in part: (as read)

"Under an N-1 event the industrial load would be curtailed and only the non-industrial load will be supplied,

i.e., overall YIS demand would be lower than shown in the figure. However, the load profile shown reflects the changes in non-industrial load requirements over the peak load days."

Would you agree that during an N-1 event, industrial loads are interrupted?

A. MR. HALL: That is the working assumption, yes.

Q. Are industrial loads interrupted at any other time? 15:34

A. MR. HALL: Mr. Chair, industrial loads can be part of our -- what's called our load-shedding scheme. So if we have a loss of generation, we have to drop off a commensurate amount of load.

And so that can involve us dropping mines, it can involve us dropping particular communities or areas within Whitehorse.

So they're part of the load-shedding scheme as well.

Q. And during an N-1 event, or if they're part of a load-shedding scheme, do the industrial loads cease operations or do they utilize onsite generation? 15:34

A. MR. HALL: Mr. Chair, one of the reasons why the industrial loads are assumed to be dropped during an N-1 is they typically do have their own sources of

generation, so they can maintain either full operations in some cases or partial operations in others.

Q. And for those with onsite generation, is that generation source likely to be diesel?

A. MR. HALL: By our understanding, yes.

Q. If there is an N-1 event that lasts for a longer period of time, like two weeks, how would it impact industrial consumer bills?

A. MR. MOLLARD: The short answer, they wouldn't be charged when they're not hooked up to the system. So if we had to disconnect them for N-1, they would be on their own and they would not be charged. 15:35

But just to be clear, Mr. Chair, I've been here 20 years now and I've not seen that type of event where we had that type of outage with an industrial on the system.

So I'd be remiss if I said I knew all the details of what the billing would look like for that month.

Q. And if there was both an N-1 event and the BESS was charging off-peak, would YEC consider that a service as being provided to the industrial load at that time that's chargeable? 15:36

A. MR. MOLLARD: Sorry, Ms. Graham, can you say that again?

Q. Sure. If there's an N-1 event, so that would impact

the industrial load --

A. MR. MOLLARD: M-hm.

Q. -- and the BESS is charging off peak, would YEC consider that the industrial load is receiving a service at that time that's chargeable by YEC? By "chargeable" I mean like by payment.

A. MR. MOLLARD: No. Then we would not see it that way.

Q. If a larger diesel generator was required to provide the N-1 capacity shortfall rather than the BESS Project, would YEC have the ability to meet some or all of the curtailed industrial load caused by the N-1 event? 15:37

A. MR. HALL: Mr. Chair, I think it's important just to remember that it's an assumption at the front end that industrial loads are curtailed or kicked off the system during an N-1 event. It's not a decision that -- assumption that we vary. It's a working assumption that's been there from the beginning.

So I don't think we would make a decision to suddenly change. 15:37

A. MR. MOLLARD: Yeah. And to be clear, Mr. Chair, we brought this policy forward to this Board for their review. And while they didn't explicitly approve it, we put to the Board that that's the approach we would

use, and we wouldn't vary from that approach without coming back to the Board.

Q. And my final question on this topic, does a diesel generator provide a better ability to mitigate or recover the costs -- the loss of curtailed load during an N-1 event relative to the BESS?

A. MR. HALL: Mr. Chair, I would argue that a diesel is worse, because a BESS -- one of the advantages of a BESS, as we discuss in the application, is it has almost instantaneous ability to ramp to full output; whereas a new diesel plant can take several minutes to ramp up. 15:38

And so a BESS has a much greater ability to keep the grid stable and operating versus a diesel engine.

Q. I'm going to move to the issue of battery chemistries, and I am kind of cognizant of the discussion of chemistries that you've had earlier, but I'm just trying to understand at a high level what analysis, you know, YEC has done so far and how the different options may impact the BESS Project. 15:39

So if you can turn to YEC's IR responses to the Board, and this is pdf page 38, or IR Response 1-13 sub (d). And just for context here, the Board asked YEC to confirm its preferred battery chemistry, and YEC indicated that's going to be determined through the

procurement process.

And in the same IR the Board asked YEC to explain the benefits and limitations of each of the three battery chemistries. And on pdf page 39, which is the next page, YEC has a table identifying the three cathode technologies, being, in short form, LFP, NMC, and NCA, and there's a --

A. MR. MOLLARD: Ms. Graham?

Q. Yes.

A. MR. MOLLARD: It appears that we've lost the link to that IR because we're on -- can you point out which IR you're looking at? 15:40

Q. Sure. It's IR 1-13 sub (d). Let me see if I can pull it up quickly.

A. MR. MOLLARD: Okay, we're there.

Q. Okay.

A. MR. HALL: Okay, we've got it.

Q. Okay. And do you see a table, it might be on the following page, that has -- "Cathode Technology" as one of the headers and "Advantages" and "Disadvantages" is the headers in the table? Yes, okay. 15:40

So has YEC confirmed that using any of these three chemistries will result in the BESS Project achieving the reported benefits of the BESS Project?

A. MS. MILOJEVIC: My understanding from the analysis

done is that any of the three technologies could deliver the services that we defined in the BESS. However, we will confirm that through our procurement process and selection of vendors, that they will be able to deliver the technical features we're asking for.

Q. And for each of the NMC, the NCA, and LFP, what is the one system service they excel at compared to the others?

A. MS. MILOJEVIC: I would ask Ms. Zuliani to comment on that. 15:41

A. MS. ZULIANI: So I think maybe we should step back. You know, these are variations of the same primary technology. We're really digging into the difference here in the chemical composition of the cathode. So there are some differences in performance, and I can -- we'll get into those, but these are kind of flavours of the same general technology.

In terms of the NMC chemistry, the NMC chemistry tends to be suited to energy-type applications. So that's batteries with durations greater than one or two hours. 15:42

Similarly, LFP is also more suited to the energy-type applications.

The NCA chemistry is more suited more towards a

power-type application.

However, that being said, it's really a combination of factors which would drive a decision on which chemistry you would go with.

Q. And would using any of these three chemistries result in the 20-year projected lifespan of the BESS Project being met?

A. MS. ZULIANI: It would, generally speaking, yes, subject to verification with the selected vendor, because it would be based on their specific cell, not only the chemistry. 15:43

Q. And are there any substantial differences between the charge and discharge times of these three chemistries?

A. MS. ZULIANI: As I mentioned, the NCA chemistry tends to be more towards the power application, so it would be more suited towards a shorter discharge, or charge. But that's really a function of how you select your battery and how you design the system, as opposed to the chemistry itself. So any could provide the 2-hour discharge duration that we cited in this project. 15:43

Q. My next few questions focus on power quality. So in YEC's IR responses to the Board, at pdf page 11 -- 100, my apologies, which is IR Response 1-24 sub (c).

Oh, I'm sorry, it's pdf page 212, 212. I was

looking at the old cite I had.

MR. LANDRY: Sorry, Ms. Graham, could you just go over that again? Are we in the consolidated or in the --

MS. GRAHAM: We are in the consolidated. It should be pdf page 212.

MR. LANDRY: Just give me a second. And which IR is that?

MS. GRAHAM: 24 sub (c).

MR. LANDRY: I have it. Thank you. 15:44

MS. GRAHAM: Perfect.

Q. The Board asked for the Takhini substation: (as read)

> "...the Hatch Report indicated that the BESS Project could respond to deviations between 56.5 to 59.5 hertz, reducing their impact on power quality. Please confirm that the deviation from 60 hertz results in power quality issues and not the Battery Energy Storage System Project." 15:45

And then on the following page YEC confirmed that the BESS Project is not expected to reduce power quality.

So can you just walk me through why the BESS Project is not expected to reduce power quality?

A. MS. MILOJEVIC: Yes. So in fact I would say that

the BESS Project is expected to increase power quality.

When we talk about the grid stability services that the battery provides, so this is talking about frequency regulation, which helps keep the system within its acceptable frequency, which is a component of power quality, the BESS providing that service actually increases the power quality. Similarly with things like reactive power and voltage regulation. So the very complicated electrical engineering services.

But, generally speaking, the services that the BESS provides from a reliability perspective increase power quality. And this is one example where it's discussing frequency deviations. So when the frequency on the grid goes outside of the acceptable range, which is what can trip under frequency load shedding, which is where customers are dropped off, as Mr. Hall was talking about before, and so the BESS being able to keep the frequency within the desired range can prevent that load shedding, for example, is one of the ways it increases power quality. 15:46

15:46

Q. And, in general, one of the features of battery storage systems is to ensure there is no degradation of power quality; is that right?

A. MS. MILOJEVIC: So the standards that would be set for the battery to follow -- so in its controlled

system you essentially program the battery and you set its settings of how it's going to perform. In those settings you would include the power quality attributes that you would want to maintain on the grid, and the BESS will output accordingly to try to maintain those power quality attributes.

Q. Is it possible that the BESS Project could contribute to power quality issues in the future?

A. MS. MILOJEVIC: I think we would see it continuing to improve any potential power quality issues given the services it provides. 15:47

MS. GRAHAM: Mr. Chair, now may be a good time to take a break.

THE CHAIR: Very well. So we'll break for ten minutes.

(ADJOURNMENT)

THE CHAIR: Ms. Graham, are you ready to continue?

MS. GRAHAM: Thank you, Mr. Chair.

Q. My next set of questions concern the various energy storage options. Staying in YEC's IR responses to the Board, if you could turn to page -- pdf page 259. This is IR Response 1-38 sub (b). The Board asked YEC to explain the drawbacks of connecting energy storage technologies aside from the lithium ion option to the 16:05

YIS.

And in response, on the next page, in the last paragraph, YEC submitted that other energy storage technologies were not able to meet the grid's needs as well as lithium ion batteries, taking into consideration the following factors: calculated power, energy and discharge time characteristics required, along with maturity, costs, and environmental and socio-economic attributes of the energy storage technologies. 16:06

The IR response also referenced Table 4-1 in the Hatch report as providing a summary overview of the difference between various storage technology capabilities.

And if you could turn to this. This is pdf -- my apologies, I don't have the number in the consolidated version, but it's page B-26 of the Hatch report.

MR. LANDRY: Do you have the reference, Ms. Graham, in the YUB response? Or is it in the application? 16:07

MS. GRAHAM: It's in the application.

MR. LANDRY: Okay.

MS. GRAHAM: It is -- actually, that's why I don't have it. It's pdf page 82 of the application. My apologies. I was thinking it was in the IR

responses. So pdf page 82 of the application, or page B-26.

Q. And the following energy storage technologies are identified in the table: One, pumped hydro; two, compressed air; three, flywheel; four, lithium ion battery; five, flow battery; six, lead acid battery; and seven, supercapacitator.

Can you just walk me through at a high level some of the concerns that you had with the other energy storage technologies given these factors that YEC considered in its evaluation. 16:08

A. MS. MILOJEVIC: I would ask Ms. Zuliani to provide comment.

A. MS. ZULIANI: Sure. So I will just walk through each of the technologies with respect to the factors.

Pumped hydro, specifically it's constrained to locations with a hydro-type resource. As well, it tends to be for mega projects, the 50 -- the 10-, 50-, 100-megawatt range, and several hours of duration. So it's not necessarily suitable for this type of application. As well, the lead time on this type of project can be quite longer than a lithium ion battery project. 16:08

Compressed air, we would need an underground cavern. That's relatively why that was not selected.

A flywheel technology is very short duration on the order of minutes. So we would not be able to support the N-1 primary use case.

The flow battery technology is not as mature as lithium ion technology. Therefore, there's increased risk, as well as it tends to have a higher cost, particularly for a remote location, where it has a much bigger footprint and requires many more containers to come to site.

Lead acid battery. In terms of safety and environmental, it does contain lead and it does contain concentrated sulphuric acid, so it's less desirable. 16:09

And, finally, supercapacitators as well are a very short duration technology, on the order of a few minutes. As well, they are quite immature in terms of grid-type applications.

Q. So if I could summarize, aside from flow battery, which has some cost concerns identified, and lead acid battery, which has some safety and environmental concerns, the reason the other technology capacities weren't able to meet the grid's needs was based on function largely, like there's some functional constraints in terms of the physical location they needed to be in or their maturity or their suitability for the N-1 that YEC is trying to resolve? 16:10

A. MS. ZULIANI: Yes.

Q. Okay. I would like to move to some questions regarding stakeholder concerns. This is in the IR responses to the Board, pdf page 279, and it's IR Response 1-46(c).

And the Board asked if stakeholders still had outstanding concerns for six issues. And in response to the requests on pdf pages 280 and 281, so on the following pages, YEC provided a table outlining its approach to addressing stakeholder concerns, and YEC advised it was continuing to communicate with the public about how the concerns had been addressed or mitigated. And I believe earlier today YEC indicated it was doing so by its website and social media. 16:11

Is YEC aware if there are still outstanding concerns from stakeholders at this time?

A. MR. HALL: Mr. Chair, Andrew Hall.

I think it's important to note that -- well, a few things.

If I look across our suite of projects we're working on and we think about the relative level of stakeholder concerns, I'd say the battery is on the low end. Namely -- you know, I think, relatively speaking, these concerns are fairly manageable. I think it's fair to say they're probably -- there probably are a few remaining stakeholder concerns. 16:11

So, for example, for the KDFN site, I believe that the property owners on the other side of the Alaska Highway had some concern about lights, pollution, for example.

And so, you know, our takeaway from that was to specifically meet the design, make sure that the lighting that we need for security reasons is appropriately angled so that it's not pointing -- scattering lights unnecessarily, for example.

So there's probably a few concerns that remain, but I think, relatively speaking, you know, we didn't hear anything major about the KDFN site, and I think they're very manageable given the design flexibility that we have as we move to detailed design. 16:12

Q. And earlier today, YEC confirmed that the YESAB application was filed. I know in the application the projected filing date was March 31st, with a decision by the end of June.

Can you confirm that the application was filed by March 31st and the decision date, anticipated decision date, remains the same? 16:13

A. MS. MILOJEVIC: We filed the application on April 29th, 2021, and expect a decision in July of this year from YESAB.

Q. Okay. I'm going to assume that, given that delay of a

month, there aren't going to be any changes to the costs or timing of the project as described in this application to the decision from the YESAB being delayed a month?

A. MS. MILOJEVIC: No.

Q. So I would like to go to talk a bit more about the major projects identified in the 10-year renewable electricity plan.

So if you could go to Yukon Energy's application, pdf page 29, and this is hard copy page 25, I believe. 16:14

Starting at the third paragraph, about two-thirds of the way down, YEC states: (as read)

"The three major new projects YEC is proposing in the 10-Year Renewable Electricity Plan are: electricity purchases from the planned Atlin Hydro Expansion Project, construction of a pump storage facility at Moon Lake, and upgrading and expansion of the Southern Lakes Transmission Network to facilitate 16:14 the Moon Lake Project and other potential improvements."

And turning to pdf page 32, which is hard copy 28, this Table 4-1, which displays the forecasted "Non-Industrial Peak & Dependable Capacity Under N-1 Capacity Planning

Criterion."

And from this table, I'm interested in the row called "Committed and Planned Supply Options," which has the rows, "Diesel Replacements," "Whitehorse 2 Uprate," "Atlin Hydro EPA," "DSM," and "Moon Lake Pump Storage Phase 1."

So, based on the forecasts in this table, will YEC still require 12.5 megawatts of thermal generation in the form of diesel replacements if all of the BESS, Atlin, and Moon Lake proceed? 16:16

A. MR. HALL: Andrew Hall. Okay, just to be clear, the diesel replacements is a planned project, so it's part of that plan.

And what this table shows is that in '23/24, that 12.5 megawatts of replacement capacity would be installed and then remain in place for the duration; right? So the 12.5 stays there until the end of that period, 2030/2031.

So it's not an either/or. It's a portfolio of projects that each add a contribution to closing that capacity gap. 16:16

Q. Okay. So you're saying YEC needs the diesel, the BESS, Atlin, and Moon in order to get --

A. MR. HALL: Correct.

Q. -- the 12.5 megawatts?

A. MR. HALL: No, not to get the 12.5 megawatts. In order to close the gap. And where you see the gap being closed is the row right at the bottom.

So the "Capacity Shortfall," the negative numbers means that we're -- we have a shortfall, and you can see that those negative numbers persist until 2028/29, where it flips positive, and that means that we have sufficient dependable capacity.

So, in effect, it means that we no longer have to rent any temporary diesels at that time. 16:17

Q. So, earlier today, YEC confirmed that Atlin and Moon Lake will reduce the grid's reliance on thermal.

Do you know how much these projects will reduce the grid's reliance on thermal?

A. MR. HALL: It depends on what -- you know, on the meaning of "reduced reliance on thermal."

So the one way to interpret that is the requirement to rent temporary diesels. And so each temporary diesel is 1.8 megawatts, so you can divide the numbers by 1.8. 16:18

So I'll pick an example. I don't have a calculator with me -- but the point is that, from one perspective, these additional capacity resources just allow you to progressively eliminate diesel rentals going forward.

Q. All right. And Atlin is anticipated to provide 8.5 megawatts or more of firm capacity starting in 2024/2025.

If Atlin proceeds, would this render the BESS Project as purely excess capacity from the perspective of the N-1 capacity criterion?

A. MR. HALL: No, that's incorrect. You still have a deficit at that time, so that in 2024/25, when Atlin joins the grid, you still have a negative 8.9 in that bottom row, and that includes the battery. 16:19

So all of these -- all of these progressively, as these new resources are added, what they're doing is narrowing a gap.

And you can see that, actually, in Figure 4.1, where the red line is the non-industrial peak, and you can see that the sum total of those coloured sections are below the red line, until such time that Moon Lake, the yellow, is added. Right?

So that includes -- the green includes the battery -- I'm sorry, no. The purple is the battery. 16:19 **So the battery is needed there, you know, from the point that it's installed all the way through.**

Q. Has the status of any of the three major projects identified in the 10-year renewable electricity plan changed in terms of their timing?

A. MR. HALL: I would say we don't have any material updates in terms of timing, no.

Q. All right. I just have another question about the battery location options provided. So this is at the application, YEC's application, pdf page 38, hard copy page 34.

The first sentence on the page states: (as read)

"The three battery location options were considered as part of Project planning - each was selected for evaluation based on proximity to YEC's existing grid infrastructure in the Whitehorse area."

So can you just walk me through why proximity was the primary consideration?

A. MS. MILOJEVIC: Proximity was the primary consideration as the load centre for the Yukon interconnected system is Whitehorse.

So to be able to connect close to our existing infrastructure near our load centre was the key requirement used.

Being close to existing infrastructure means that you can hook into a substation if required to hook a generation asset to the grid without having to construct a whole new substation, which is quite a bit

16:20

16:21

more expense.

So that was the key consideration for location in terms of ease and expedition of interconnection.

Q. And so cost was part of that as well?

A. MS. MILOJEVIC: That's correct, yes.

Q. Okay. I'm almost done. I'm going to move to some questions about secondary use cases.

These are in YEC's IR responses to the Board at pdf pages 252 and 253.

A. MR. MOLLARD: YUB 36, I believe, Ms. Graham. 16:22

Q. Thank you. So the first passage on pdf page 252 deals with Yukon Energy's comments about frequency regulation. Is there a heading "Frequency Regulation" at the bottom of the third paragraph?

And YEC states: (as read)

"Frequency regulation could not be provided by the most cost-effective alternative, rental diesel units, as these units are primarily used for peaking generation and are not 16:22 configured for frequency response automation in the same manner as the BESS."

So can you describe for me why rental diesel units are not configured for frequency response automation in the

same way as the BESS?

A. MS. MILOJEVIC: Yes. So the battery can provide frequency regulation just when it's connected to the grid. So it doesn't need to be charging or discharging. It can end up discharging to help with the frequency regulation, but it's providing that service and monitoring the frequency simply by being connected to the grid.

Whereas, rental diesel units have to be online and running in order to contribute to frequency. And, of course, that would consume hours on the rental contract. 16:23

And so, unless those units happen to be online for peaking generation during a peak, at which point we would expect they would normally be fully deployed and not able to provide frequency regulation, they wouldn't otherwise be online and therefore, not available to provide that service.

So, essentially, the way we use the rental units, and the way that they're contracted, does not enable us to provide frequency regulation with the units. 16:23

A. MR. MOLLARD: If I could add, Ms. Graham, the rental diesel units, their primary application is a remote application. They don't generally connect to the grid. So in order to make them work on our system,

they do require retrofitting.

So frequency regulation is not something that you need to worry about as much on a standalone, so they're not configured that way when we get them.

Q. And then if you could turn to the following page, which is pdf page 253, there's some comments on voltage control. And the last -- in the first paragraph, in the last sentence, it states: (as read)

"The most cost-effective alternative to the Project, rental diesel units, could produce reactive power but would not be configured to automatically assist with voltage control on the grid." 16:24

And so, similarly, can you describe why rental diesel units would not be configured to automatically assist with voltage control on the grid?

A. **MS. MILOJEVIC: So very similar to the response for frequency regulation, which is that we would only have the units online during a peak event to serve mode. So they would not be able to provide voltage regulation.** 16:25

And per Mr. Mollard's response as well, they aren't set up to sort of speak to the whole grid and see the whole system configuration, so they wouldn't be able to provide voltage control with any visibility to

the broader grid, in terms of looking at what the voltage is in different segments of the grid.

Q. And staying on the same page, the last paragraph, the last sentence deals with blackstart and outage restoration capability, and states: (as read)

> "While the most cost-effective alternative, rental diesel units, can support blackstart operations, these units would not provide the decrease in outage time given their smaller size (e.g. 1.8 megawatt individual units compared to the 20 megawatt BESS)."

So, again, can you just walk me through why rental diesel units could not provide the decrease in outage time for blackstart operations? 16:25

A. MS. MILOJEVIC: Yes. So when we're in a blackstart event, that means a total grid outage, a total blackout literally, so the way that we restore the grid after a blackstart event is we take sections of the grid and we put them online. And so the size of the section that we can bring online is dictated by the capacity of the unit. 16:26

So in the rental diesel unit's case, it would only be able to serve 1.8 megawatts of load, which means you would have to bring up 1.8 megawatts of load, stabilize

the grid at that level, and then you could increase by another 1.8, for example, if we're talking about the rental units.

With the battery system, it's 20 megawatts in size, which means you can bring online 20 megawatts of load at once. So over 10 times the size of the grid that can be reenergized and brought online.

So that significantly speeds up the outage restoration time because you can bring on so much more load back online after an outage then compared with the diesel rentals. 16:27

Q. And you mentioned it's a lot faster. How much faster would the BESS Project be compared to diesel for a blackstart and outage restoration?

A. MS. MILOJEVIC: It would depend on circumstance of the outage in terms of the size of load to be brought -- to be brought back online, but from a start-up perspective, the diesels take about five minutes to start, to start other units, whereas the BESS can be started instantaneously. 16:27

Q. All right. I've got one final question, but, unfortunately, I don't think I have the consolidated number.

It's in Mr. John Maissan's IRs. I'm just going to see if I can find it really quickly.

It is IR Response 1-11(a). I believe it's pdf page 13 of the consolidated IR documents, and it's a question about peak renewable integration.

So, for context, the IR asks why there's different numbers for BESS Use frequency and total throughput useable cycles in Table 3-1, which is titled, "Estimates Annual Throughput for 20 megawatt/40 megawatt hour BESS YIS of the Application."

And in the response, YEC indicated that: (as read)

"BESS use is the estimated discharge per year for the following events." 16:28

And then on the third bullet point, which is, I believe, pdf page 14, YEC stated: (as read)

"For renewable integration, 100 cycles assumed per year at 15 percent discharge of battery capacity (40 megawatt-hours) equals 6 megawatt-hours BESS use per event."

Can you just walk me through how this was derived?

A. **MS. MILOJEVIC: The reference cycles that were actually out of the -- were in our application but drawn from the Hatch report, so I'll ask Ms. Zuliani to comment on the derivation of those.** 16:29

A. **MS. ZULIANI: Thank you. So in terms on the reference cycles, I mean, we determined this in**

discussions with Yukon Energy of what would be reasonable for these type of excursions, as well as our review of the frequency excursions currently on the grid. So, in this case, for renewable integration, it also relates to frequency excursions.

So the 100 cycles per year was an estimate based on the current operation, with some augmentation considering that renewables are more variable than hydro and thermal generation.

In terms of the 15 percent discharge, again, this was just an assumption that was used. It will depend on the specific event. However, we worked with an assumption to have a conservative approach of a 15 percent or 6-megawatt hours discharge for each of those cycles to estimate the annual usage of the battery. 16:30

MS. GRAHAM: Thank you, panel.

And thank you, Mr. Chair. Those are my questions.

THE CHAIR: Okay. It appears we may be getting through things a little more efficiently than originally forecast. I gather the next step would be for Ms. Sabo to come back for her second round of questions. But given the time of day and the fact that we started early, maybe we can call it a day and then start fresh in the morning with Ms. Sabo. 16:30

Does that cause anybody any problem?

The other thought was as well that, again, a 9 to 5 day is a pretty long day, and it was suggested that perhaps we could start at 9:30. For those who may not be presently online with us, we can just give them notice indicating that we will start at 9:30 instead of 9.

Does that altered start time cause anybody any problem?

A. MR. MOLLARD: No issues for us, Mr. Chair. 16:32

THE CHAIR: Okay. I think maybe that might be the way to go then, and then we can give us a little more time to digest what was gathered today. Yeah, so we'll start at 9:30 tomorrow morning, and we'll -- needless to start the day a little unreasonably as well, so... (phonetic)

MR. LANDRY: Mr. Chair, I wonder if I could just make one comment. Obviously there are a few undertakings that were on the record. I would like your okay to speak to my clients, the panel, to make 16:32 sure that we have, you know, a capability to respond appropriately to those undertakings in the time frame that we have, just so that we can -- the time frame is pretty quick here, so that we can move it along, if that's okay.

And the only other question I have is maybe -- does Ms. Sabo have an estimate of how long she might be?

MS. SABO: Thank you, Mr. Landry, you beat me to the punch, because that's why I unmuted my mic as well. I would expect I've got a couple of hours. So I would expect that we're not going to go all day tomorrow between our questions and Board questions, either concluding in the morning or early -- you know, early mid afternoon, depending on how things go. So 16:33
that would be the time estimate.

And, Mr. Landry, to your point about talking to your client, as you're well aware, it's the usual course as well not only to make sure that undertakings are understood, but if there's any other business you need to do with the YEC panel witnesses, it's the Board's usual practice, Mr. Chairman, to allow counsel to speak to the witnesses on non-hearing related matters that may come up overnight.

MR. LANDRY: Thank you. 16:34

THE CHAIR: You're comfortable with that, Mr. Landry?

MR. LANDRY: Yes, I am, sir. That works for me. I mean, one other thing that I may discuss with the panel is just the whole issue of getting our

submissions in the end ready, but I'm sure Ms. Sabo is fine with that too.

THE CHAIR: Yeah, Mr. Landry, do you have a rough idea at this stage of the process how much time you'll need to -- with your panel to -- for any kind of redirect-type questions to elaborate on what --

MR. LANDRY: At the moment, sir, subject to talking to a couple of people, not the panel members, I would say very little.

THE CHAIR: Okay. Good. Well, that makes tomorrow look fairly manageable then. 16:35

All right. Well, subject to those comments, then we'll reconvene tomorrow at 9:30.

A. MR. MOLLARD: Sorry, Mr. Chair, just to be clear, Deana, do you want us on early?

MS. LEMKE: Yes, just half an hour early so I can do a sound check.

A. MR. MOLLARD: 9:00 for sound check?

THE CHAIR: Yeah, that might make --

MS. LEMKE: Maybe 10 minutes early. Maybe 15. 16:35

THE CHAIR: Mr. Rondeau, are you able to check in with us in the morning to sort out your technological problems?

MS. LEMKE: I don't think he's on the line.

THE CHAIR: Maybe not. Okay.

Okay. Have a pleasant evening, and we'll see you in the morning.

(PROCEEDINGS ADJOURNED AT 4:35 P.M.)

PROCEEDINGS ADJOURNED TO 9:30 A.M., MAY 5, 2021

Certificate of Transcript

We, the undersigned, hereby certify that the foregoing pages 1 to 187 are a complete and accurate transcript of the proceedings taken down by us in shorthand and transcribed from our shorthand notes to the best of our skill and ability.

Dated at the City of Calgary, Province of Alberta, on May 4, 2021.

"Donna Gerbrandt"

Donna Gerbrandt, CSR(A)
Official Court Reporter

"Lorelee Vespa"

Lorelee Vespa, CSR(A) RPR CRR
Official Court Reporter

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