MANITOBA PUBLIC UTILITIES BOARD

re:

MANITOBA HYDRO

2023/24 and 2024/25

GENERAL RATE APPLICATION

Hearing

Before Board Panel:

Robert Gabor, KC - Board Chairperson

Marilyn Kapitany - Board Vice Chair

Carol Bellringer - Board Member

Hamath Sy - Board Member

George Bass, KC - Board Member

HELD AT:

Public Utilities Board

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Winnipeg, Manitoba

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Pages 1378 to 1651

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Emily Guglielmin	)Manitoba Chiefs
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--- Upon commencing at 9:00 a.m.

THE CHAIRPERSON: Good morning. Mr. Peters...?

CONTINUED MANITOBA HYDRO ASSET MANAGEMENT AND CAPITAL EXPENDITURE PANEL:

HAL TURNER, Resumed
JIM PAWLUK, Resumed
KRISTA HALAYKO, Resumed
ALASTAIR FOGG, Resumed
CYRIL PATTERSON, Resumed
TANIS BRAKO, Resumed
SARAH VINE, Resumed

MR. BOB PETERS: Yes, thanks you, and good morning. Still seated before the Board today is Manitoba Hydro's Asset Management and Capital Expenditure Panel. Yesterday, Board counsel included questions of the panel of witnesses, as did the Assembly of Manitoba Chiefs.

So this morning we are starting with the Consumers Coalition questions, and it's seen on the screen, followed by the General Service Small/ General Service Medium representative's questions, and

then followed by the Manitoba Industrial Power Users questions.

What is not shown before the Board on the screen is -- is the afternoon intention at this point to introduce and seat the Midgard panel, and we welcome the Midgard witnesses who have joined us seated in the back of the room.

They will work with counsel for the Consumers Coalition, and our intention is that by mid-afternoon we would be able to hear their direct evidence presentation. And at the end of that, that will conclude our day, so we will start tomorrow morning with -- with cross-examination of the -- the Midgard panel.

So I trust that's helpful. If there's questions on process, please let me know. Thank you.

THE CHAIRPERSON: Mr. Czarnecki, are there any documents to put in?

MR. BRENT CZARNECKI: I think there was a couple, but I'll wait till the morning break, Mr. Chairman. One (1) area quickly -- Ms. Brako had one (1) minor clarification from her testimony yesterday. If she could make it now, it will be brief.

THE CHAIRPERSON: Yeah, okay. Ms.

Brako...?

MS. TANIS BRAKO: Good morning. Yesterday I had spoken to our customer complaint registry relative to a question of whether or not we could identify which region our customers were from.

So while we don't have a reserve indicator in that customer complaint registry, we do collect information such as address and premise number which we could manually pull to -- to identify where the customers are in the province. So just wanted to clarify that. Thank you.

THE CHAIRPERSON: Thank you. Sorry, thank you very much.

Mr. Williams...?

DR. BYRON WILLIAMS: Good morning, Mr. Chair and members of the Panel. Mr. Peters stole my thunder a little bit, but I do want to introduce just in the back row Mr. Peter Helland who's I think farthest from you, courteously raising his hand. And to his left is Mr. Christopher Oakley, and they'll be appearing this afternoon to give evidence.

Mr. Chair, in terms of exhibits, we have two (2) exhibits we'd like to enter as aids to cross-examination. We've shared them with Manitoba Hydro in advance, and Mr. Czarnecki was -- has shared

with me that he doesn't object to them being admitted.

So one (1) document is -- is references from five (5) Public Utilities Board Orders from 116/''08 to 59/''18, and we'd propose that be marked as Consumer Coalition number 13. It's the white page, Mr. Chair.

--- EXHIBIT NO. CC-13: References from Five (5) Public Utilities Board Orders from 116/''08 to 59/''18

DR. BYRON WILLIAMS: And then a second document is an excerpt from what is titled 'Manitoba Hydro's 2015 General Rate Application', the Planning and Operations Panel, and we propose that be marked as Consumer Coalition 14, Sir.

--- EXHIBIT NO. CC-14: Excerpt from 'Manitoba Hydro's 2015 General Rate Application', Planning and Operations Panel

CROSS-EXAMINATION BY DR. BYRON WILLIAMS:

DR. BYRON WILLIAMS: If I could ask

Ms. Schubert to pull up Consumer Coalition First Round Information Request to Manitoba Hydro 126 -- 126(b), attachment 1.

And, Ms. Brako, I think I can see you way -- that's you way back in the back there. You're raising your hand. Okay. I can't hear you though. Can -- is your mic...

MS. TANIS BRAKO: Can you hear me now?

DR. BYRON WILLIAMS: Just barely.

MS. TANIS BRAKO: Okay. I'll -- I'll speak up --

DR. BYRON WILLIAMS: Thank you.

MS. TANIS BRAKO: -- as required, yeah.

DR. BYRON WILLIAMS: And, Ms. Brako, you'll see before Manitoba Hydro's customer satisfaction and perceptions report for the second quarter of the '22/'23 year, agreed?

MS. TANIS BRAKO: Agreed.

DR. BYRON WILLIAMS: And it's dated September 2022?

MS. TANIS BRAKO: Correct.

DR. BYRON WILLIAMS: And I wonder if I could ask Ms. Schubert to go to page 22 of 26. And, Ms. Brako, this customer satisfaction and perceptions

tracking, it's a quarterly report of Manitoba Hydro?

MS. TANIS BRAKO: That's correct.

DR. BYRON WILLIAMS: And you ask a series of questions over time, and so you -- you track the responses over time, agreed?

MS. TANIS BRAKO: We do, yes.

DR. BYRON WILLIAMS: And what we see here on appendix A to -- to this -- to this survey from the -- the second quarter of 2022 is, on the left-hand side, we -- we see certain measures that Manitoba Hydro tests over time, including reliability, price of electricity, agreed?

MS. TANIS BRAKO: That's correct.

DR. BYRON WILLIAMS: And going across the top left to right, in the first column, we will see the results of those measures from the first quarter -- or from the second quarter of the particular year, in this case, 2022 second quarter, agreed?

MS. TANIS BRAKO: That's correct.

DR. BYRON WILLIAMS: And what you're doing is comparing it to a rolling average being the third column, agreed?

MS. TANIS BRAKO: Yes.

DR. BYRON WILLIAMS: And then you also

compare it in the -- the fourth column over that you'd compare the second quarter average to the five (5) year mean as well as they typical range, agreed?

MS. TANIS BRAKO: Correct.

DR. BYRON WILLIAMS: And then finally, you -- you take a look at two (2) year trends and five (5) year trends and -- and other information as we move along to the right, agreed?

MS. TANIS BRAKO: That's right.

DR. BYRON WILLIAMS: And so, if we go to the second row, being reliability of electricity, what -- what that is telling us is that, in terms of that metric as measured by Manitoba Hydro for the second quarter, the response of -- in -- in terms of consumers' perceptions of the reliability of electricity was 8.62, agreed?

MS. TANIS BRAKO: Correct.

DR. BYRON WILLIAMS: Is that out of a scale of 10?

MS. TANIS BRAKO: Yes, that's correct.

DR. BYRON WILLIAMS: And going one column over, the second quarter average of 8.62 is being compared to the rolling average of 8.67, agreed?

MS. TANIS BRAKO: Yes.

DR. BYRON WILLIAMS: And if we -- what

we see in the -- the fourth column is that the -- the five (5) year mean for reliability of electricity is 8.68, agreed? Oh, five (5) -- the five (5) year average, right?

MS. TANIS BRAKO: Yes. Correct. Average, yeah.

DR. BYRON WILLIAMS: Yeah, mean.

MS. TANIS BRAKO: Yeah. Yeah.

DR. BYRON WILLIAMS: And the lower range over the last five (5) years has been 8.52, correct?

MS. TANIS BRAKO: So, that would be the second quarter average versus five (5) year mean typical -- and typical range. So, the first number would be your second quarter average.

DR. BYRON WILLIAMS: No, the -- just without meaning to correct you, the second quarter average is 8.62, correct?

MS. TANIS BRAKO: Yes.

DR. BYRON WILLIAMS: Okay.

MS. TANIS BRAKO: Versus -- yes --

DR. BYRON WILLIAMS: And so, what you're seeing --

MS. TANIS BRAKO: Correct.

DR. BYRON WILLIAMS: -- in the fourth

column, the 8.52, is the low end of the range over the last five (5) years, correct?

MS. TANIS BRAKO: Correct.

DR. BYRON WILLIAMS: And the higher end of the range is 8.83, correct?

MS. TANIS BRAKO: Yes. Correct.

DR. BYRON WILLIAMS: Okay. So, that 8.62 from the second quarter would be within the five (5) year range, right?

MS. TANIS BRAKO: That's correct.

DR. BYRON WILLIAMS: Okay. Ms. Brako, we're not going to spend as much time on other aspects of this table, but if we go down to, "Price of electricity," which is the second last measure.

Do you see that?

MS. TANIS BRAKO: I do.

DR. BYRON WILLIAMS: In terms of consumer perception in terms of the price of electricity, they gave it a score of 6.29 out of 10, agreed?

MS. TANIS BRAKO: Correct.

DR. BYRON WILLIAMS: Okay. And in terms of overall service, going to the top of the measures, the score there was 8.14, agreed, out of 10?

MS. TANIS BRAKO: Overall service,

yes.

DR. BYRON WILLIAMS: Okay. And again, that was for the second quarter --

MS. TANIS BRAKO: Correct.

DR. BYRON WILLIAMS: -- of 2022?

MS. TANIS BRAKO: Yes.

DR. BYRON WILLIAMS: Thank you. Now I'm going to ask you to turn to page 7 of 26 of this document with Ms. Schubert and I. And you'll see here that, in terms of the survey, they're reporting that respondents continue to report very high satisfaction levels with electric power reliability, power quality, and speed of power restoration.

Do you see that, Ms. Brako?

MS. TANIA BRAKO: I do, yes.

DR. BYRON WILLIAMS: And again, if we're looking for the reliability of electricity -- as I struggle with my progressive lenses -- but that's the second column over.

And again, we see that eight-point-six-two (8.62) represented in that column, agreed?

MS. TANIA BRAKO: Correct.

DR. BYRON WILLIAMS: Okay. If we can go to slide 8 for just one second, Ms. Brako. And in terms of the bullets, I want to direct your attention

to the second-last bullet, which is -- and you'll -- you'll agree with me, it's stating that respondents report much lower satisfaction with Manitoba Hydro consulting with customers before making decisions that impact them. Do you see that reference?

MS. TANIA BRAKO: I do, yeah.

DR. BYRON WILLIAMS: And I've stated that correctly?

MS. TANIA BRAKO: Yes.

DR. BYRON WILLIAMS: And if we were looking for those numerical responses, we would see that, on the extreme right of -- of the bigger -- on the right-hand side of the table.

And consults with customers, that's where we see that score of six-point-two-zero (6.20), agreed?

MS. TANIA BRAKO: Yes.

DR. BYRON WILLIAMS: Slide 10, Ms. Brako -- and we'll follow-up on a conversation you had with the Board -- Board members, as well as Mr. Peters yesterday.

Directing your attention to the fourth bullet on this page, I'll suggest to you -- and I'll ask you to confirm -- that this tells us that over a third (1/3), 34 percent, of respondents still report

their household is experiencing an energy burden.

Do you see that?

MS. TANIA BRAKO: Correct, yes.

DR. BYRON WILLIAMS: Thank you. Now, Ms. Brako, to -- in terms of this report, it's from the second quarter of 2022.

Presumably, Manitoba Hydro would have received at least reports from the third quarter of 2022?

I -- I see you nodding your head, is that a "yes"?

MS. TANIA BRAKO: Yes.

DR. BYRON WILLIAMS: And would you have received reports from the fourth quarter of 2022 yet?

MS. TANIA BRAKO: Not yet. Yes.

DR. BYRON WILLIAMS: Through your counsel to -- to you, by way of undertaking, could you provide us with that third quarter report for the '22/'23 fiscal year?

MS. TANIA BRAKO: Yes. We -- we certainly can.

DR. BYRON WILLIAMS: Okay. Thank you for your courtesy.

MS. TANIA BRAKO: Yes.

--- UNDERTAKING NO. 16: Manitoba Hydro to provide third quarter report for 2022/23 fiscal year

CONTINUED BY DR. BYRON WILLIAMS:

DR. BYRON WILLIAMS: Mr. Turner, and to the front row, I'm not -- Mr. Fogg, I'm not going to have a lot of questions for you until right to the end. But you can study up on the Portage Extension, if you're looking for a bit of homework. Consumer Coalition 1-85, page 29 to 31, if you're looking for it. Don't need to go there yet.

And I will -- Ms. Vine, I will have some questions for you in a few minutes.

And then, certainly, for Mr. Pawluk and Ms. Halayko, I'll have some.

But I think it's you, Mr. Turner. You'll direct me if I'm going to the wrong person though, agreed? Mr. Turner --

MR. HAL TURNER: Agreed. Sorry, I will just -- and briefly, good morning, everyone. Another beautiful Manitoba morning.

And I just want to say, Mr. Chair, I took your advice. I'm on my second tea today before the break. So cognitively, I should be much closer to

full throttle today.

DR. BYRON WILLIAMS: Mr. Turner, as an exhibit -- I have coffee here as well, if you need some. So just in case.

Mr. Turner, you're aware that tab 7.4 of the Manitoba Hydro Application contains the 2022 report by AMCL on capital asset management? You'll accept that, subject to check, sir?

MR. HAL TURNER: On asset management, yes.

DR. BYRON WILLIAMS: Asset management.

MR. HAL TURNER: Correct.

DR. BYRON WILLIAMS: And, of course, Manitoba Hydro has had the opportunity to review that AMCL report -- AMCL report and its commentary on Manitoba Hydro, agreed?

MR. HAL TURNER: Agreed.

DR. BYRON WILLIAMS: You've studied it carefully, correct?

MR. HAL TURNER: I've read it numerous times, yes.

DR. BYRON WILLIAMS: And in Manitoba Hydro's view, I'll ask you to confirm it -- the report represents a sound and fair assessment of where Manitoba Hydro stood in terms of capital asset

management or asset management maturity, as at the time of the writing of the report. Agreed?

MR. HAL TURNER: Agreed.

DR. BYRON WILLIAMS: And this report, of course, sir, would be an important tool for Manitoba Hydro as it seeks to improve its capital asset, its asset management practices. Agreed?

MR. HAL TURNER: Agreed. We -- we certainly value AMCL's opinion. We saw a lot of value in conducting a maturity assessment and continue to -- or we expect to conduct maturity assessments ongoing as we move forward.

DR. BYRON WILLIAMS: And, Mr. Turner, we -- I think you and I had a bit of a conversation with -- about this last week, but I'll -- at the -- risk of modest overlap, I'll just ask you to confirm that in July of 2018 the Bipole III high voltage direct current transmission line was completed, on or about that date, sir?

MR. HAL TURNER: I believe that's correct.

DR. BYRON WILLIAMS: And, subject to check, it has a capacity of two thousand (2000) megawatts at the rectifier, sir?

MR. HAL TURNER: Sorry. Yes, that's

correct.

DR. BYRON WILLIAMS: And, again, this is what we did touch on briefly last week, the Manitoba/Minnesota Transmission Project was completed on or about June of 2020, subject to check?

MR. HAL TURNER: Correct.

DR. BYRON WILLIAMS: And, in terms of increasing Manitoba Hydro's firm import capability from the United States, it expanded that import capability by about seven hundred (700) megawatts, sir. Agreed?

MR. HAL TURNER: I -- I believe that's correct. I think it doubled it from seven hundred (700) to fourteen hundred (1400) megawatts.

DR. BYRON WILLIAMS: And, in essence, the MMTP or Manitoba/Minnesota Transmission Project, accounts for about a half of Manitoba Hydro's dependable energy import capability, sir. Agreed?

MR. HAL TURNER: I believe that's correct. Yes.

DR. BYRON WILLIAMS: But, of course, sir, the last achievement of Manitoba Hydro, in terms of big capital projects, was the Keeyask Project which, the last turbine -- turbine went online, on or about, March of 2022. Correct?

MR. HAL TURNER: Correct.

DR. BYRON WILLIAMS: Subject to check, its capacity is six hundred and ninety-five (695) megawatts, sir?

MR. HAL TURNER: Correct.

DR. BYRON WILLIAMS: I wonder if I could ask Ms. Schubert to turn to Coalition 1-85, I think attachment 1, page 3 of 51.

Mr. Turner, the control budget for Keeyask, the final control budget for it was $8,726,000,000, sir, agreed?

MR. HAL TURNER: I believe the current control budget is 8.19 billion, so that may be a dated number, Mr. Williams.

DR. BYRON WILLIAMS: That's okay, sir. So, so let -- let me try it in a bit of a different way.

At one point in time, the control budget for Keeyask was set at $8.726 billion, agreed?

MR. HAL TURNER: Agreed.

DR. BYRON WILLIAMS: And what this capital just -- CJI or Capital Justification document is telling us, is that the budget for financial reporting purposes of Keeyask has been now revised to $8.164 billion. Agreed?

MR. HAL TURNER: Agreed.

DR. BYRON WILLIAMS: And, so that's a downward revision of $562 million in the -- the last few years, in terms of Keeyask. Agreed, sir?

MR. HAL TURNER: Agreed.

DR. BYRON WILLIAMS: We don't need to go there, sir, but subject to check, this revision was made on or about June of 2022? It's a couple pages forward in the document of --

MR. HAL TURNER: Yeah, I think it -- there's dates on a couple of pages for it, but it's subject to check -- check. Agreed?

DR. BYRON WILLIAMS: So, but -- an improvement of about half a billion dollars to -- since the '17/'18 General Rate Application. Agreed?

MR. HAL TURNER: Agreed.

DR. BYRON WILLIAMS: And, sir, if -- if you could turn with -- with me to Consumer Coalition Exhibit 14, the excerpt from the 2015 General Rate Application and page 5. So, just one page over -- sorry, Ms. Schubert, just go to the second page in the document. My apologies.

Mr. Turner, you have that before you, sir? You're nodding your head.

MR. HAL TURNER: I do.

DR. BYRON WILLIAMS: Okay. Back at the time of the 2014/''15, '15/''16 GRA, the estimated budget at that time for Keeyask was about $6.5 billion, sir?

MR. HAL TURNER: That's correct.

DR. BYRON WILLIAMS: And so, ultimately, Keeyask cost about 1.5 billion more than the estimate portrayed on -- in -- at this point in time, for the purposes of the '14/''15, '15/''16 GRA, sir?

MR. HAL TURNER: Correct.

DR. BYRON WILLIAMS: Just going to the front page of this exhibit, sir, Exhibit Consumer Coalition 14. Mr. Turner, you'll see a number of witnesses who appeared on behalf of Manitoba Hydro during that proceeding on behalf of the Planning and Operation Panel. You see that?

MR. HAL TURNER: I do.

DR. BYRON WILLIAMS: And if we took -- look, for example, Michele Moran (phonetic), he is no longer with Manitoba Hydro. Is that correct, sir?

MR. HAL TURNER: He -- he retired, correct.

DR. BYRON WILLIAMS: And Mr. Reed (phonetic) is no longer with Manitoba Hydro?

MR. HAL TURNER: He also retired, correct.

DR. BYRON WILLIAMS: And Mr. Swatuck (phonetic) is at the University of Manitoba but no longer with Manitoba Hydro?

MR. HAL TURNER: That's correct, as is Rob Elder (phonetic), Terry Miles, David Cormie, Darren Rainkie, and Sandie Bauerlein, so Mr. Bowen would be the only remaining person employed with Manitoba Hydro.

DR. BYRON WILLIAMS: Thank you for that. And I'll remind Mr. Bowen of that next time I see him at --

MR. HAL TURNER: I'll remind him of that tomorrow.

DR. BYRON WILLIAMS: Okay. Thank you. Send my regards.

(BRIEF PAUSE)

DR. BYRON WILLIAMS: Ms. Vine, I'm going to have more questions for you later. I have one little, I hope, simple one for you right now.

From -- from the perspective of Manitoba Hydro, in -- sorry, it's from the perspective

of AMCL -- increased asset management capability will enable Manitoba Hydro to gain more value from its capital and operational expenditures and more effectively manage its risk while maintaining current service levels, agreed?

MS. SARAH VINE: Agreed.

DR. BYRON WILLIAMS: And this can go to Ms. Halayko and Mr. Pawluk. I'm not sure who's -- who's the -- but at a high level, the ultimate goal of asset management is to achieve that optimal balance of asset performance, cost, and risk, agreed?

MS. KRISTA HALAYKO: Agreed. That's the ultimate goal.

DR. BYRON WILLIAMS: And the expectation of Manitoba Hydro is that a mature asset management system will result in lower overall cost to achieve these goals that might otherwise be needed with an immature asset management system, agreed?

MS. KRISTA HALAYKO: All else being equal, the equal performance and risk as we get more mature, we will be able to have lower cost, but it's a very complicated balance.

DR. BYRON WILLIAMS: And it's the triangular balance that we --

MS. KRISTA HALAYKO: And, yeah, we're

always balancing. And as our risk is increasing, other things have to flex, as well.

DR. BYRON WILLIAMS: Thank you. Ms. Vine, one (1) of the roles of AMCL in -- in its undertaking from Manitoba Hydro was to review the 2016 UMS report, agreed?

MS. SARAH VINE: That's correct.

DR. BYRON WILLIAMS: And so, you're relatively familiar with that report, agreed?

MS. SARAH VINE: Yes. Yeah.

DR. BYRON WILLIAMS: And, Ms. Halayko, as well, the UMS report is mandatory reading at Manitoba Hydro, agreed?

MS. KRISTA HALAYKO: That's correct.

(BRIEF PAUSE)

DR. BYRON WILLIAMS: And if -- if Ms. Schubert can just go to the UMS report, tab 7.5, page 95. And, as Mr. Turner observed, she beat me to it.

In 2016 -- excuse me. Let's go to page 95. My apologies. In 2016, UMS reported on its asset management GAP assessment findings to -- to Manitoba Hydro. Agreed, Ms. Halayko?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And, Ms. Schubert, you can go to page 99, at the top. Yeah, thank you.

And -- and at a high level, what UMS was doing back in 2016, was assessing Manitoba Hydro's Asset Management Practices to compare them to Industry Standards and to the ISO 5500 standard.

Agreed?

MS. KRISTA HALAYKO: Agreed. They also used their own proprietary asset management maturity scale, as Ms. Vine had discussed yesterday.

DR. BYRON WILLIAMS: And certainly, UMS was not making these representations to Manitoba Hydro, but on the page before us that you see, they were telling Manitoba Hydro that in ten (10) previous utility management transformations they performed, they had found that utility sign -- significant improvements and productivity, and overall cost savings of 20 to 30 percent over five (5) years with the application of an Asset Management System.

Agreed?

MS. KRISTA HALAYKO: Yes, that's what it says in the report.

DR. BYRON WILLIAMS: And in terms of maturity at the time, Hydro was assessed by UMS as

having a score of 1.5.

Agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And I wonder if I can ask Ms. Schubert to take us to page -- PDF page 101 of appendix 7.4, and to the key gaps that were identified.

And, Ms. Halayko, I'm going to go through them. I'm not going to go through all of them, but I'll ask you to confirm that one (1) of the key gaps identified by UMS in the first paragraph was that the business units, and sometimes the functions within the business units, had been operating with their own objectives and limits for making asset decisions. Agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And I -- UMS also pointed out to Manitoba Hydro that because of the fact that Asset Management had developed independently in each business unit, and that the asset management functions were split within the business uni -- unit, this led to a lack of standardization of both processes and systems. Agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And, on the

bottom of this page and then the top of the next page, UMS is telling us -- or telling Manitoba Hydro, more importantly, that:

> "There were no corporate risk standards, tolerance levels, a risk assessment requirement to guide the business units leading to a circumstance where risk was being avoided rather than managed."

Agreed?

MS. KRISTA HALAYKO: Agreed. That's what UMS said.

MR. HAL TURNER: Mr. Williams, sorry. If I could just interject for just a moment. I think yesterday I talked about in our direct evidence how the business model work and the restructuring that Ms. Grewal led has positioned us to mature our Asset Management System at a more rapid pace moving forward.

And I think it speaks to some of the challenges here. I think she also spoke about enterprise risk management in her opening testimony. And again, I think trying to get the point across that we recognize some of these challenges and are taking steps to try and close those gaps.

DR. BYRON WILLIAMS: Thank you, Mr.

Turner, and I'll simply come back to you and -- and Ms. Vine about that, as well -- well as Ms. Halayko.

But -- but you'll see here on the -- the second full paragraph on this page, one (1) of the concerns expressed by UMS at this point in time, 2016, was that:

> "Most asset management efforts are focussed on capital spending with minimal attention given to optimizing, operating, and maintenance spending which, of course, is a key part of the asset life cycle."

Agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And then in -- in the second last paragraph on -- just -- no, right here is fine, Ms. Schubert. UMS was also pointing out:

> "While there was significant effort being made to develop and impl -- implement sophisticated tools to support asset management, there was a lack of formal data management and government processes and metrics."

Agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And when Manitoba Hydro sees a reference to sophisticated tools to support asset management, you would have understood that one (1) of those reference would have been Copperleaf 55, which you now know as Copperleaf.

Agreed?

MS. KRISTA HALAYKO: That is a sophis -- sophisticated tool to support asset management, yes.

DR. BYRON WILLIAMS: And Manitoba Hydro was implementing Copperleaf on or about that time. Agreed?

MS. KRISTA HALAYKO: We were -- we were starting to implement it as an enterprise. I think that happened around 2018. So we did take the guidance from the UMS report and started making further advancements following that.

It's important to remember that this is 2016, so we were just -- it was our first maturity assessment, and we took the recommendations to heart.

DR. BYRON WILLIAMS: Just to be clear, though, you -- you would acknowledge that Copperleaf was already in play at Manitoba Hydro in 2016?

MS. KRISTA HALAYKO: It was -- wasn't

fully implemented across the enterprise but, yes, we did own it and we were using it.

DR. BYRON WILLIAMS: And in fact, your experience with Copperleaf on the generation side went back some years before that, agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: Now, we'll turn to page 102 if we might under 'Key Recommendations'. And just a couple that I want to direct your attention to. In the second paragraph under 'Key Recommendations', one was:

> "to provide communication on acceptable risk for Manitoba Hydro by defining a risk tolerance level for key strategic objectives, defining a corporate standard for risk assessment, and creating a corporate standard risk register."

Agreed? That was a 2016 UMS recommendation?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And going down to the last paragraph, another recommendation was:

> "to develop processes and implement tools to address operations and

maintenance spend and the tradeoff between O&M and capital in each business unit."

Agreed?

MS. KRISTA HALAYKO: Agreed.

MR. BOB PETERS: And finally, we'll go to the -- the next page, and just one (1) more, the second last paragraph, another key recommendation was:

"to refine the current performance management framework to align asset objectives, plans, and KPIs [key performance indicators] with performance reporting and accountability."

Agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And:

"to develop metrics for monitoring asset performance, asset management performance, and management -- asset management system performance."

Correct?

MS. KRISTA HALAYKO: Correct.

DR. BYRON WILLIAMS: Ms. Vine, you're aware that UMS made some twenty-eight (28)

recommendations to -- to Manitoba Hydro?

MS. SARAH VINE: I am, yes.

DR. BYRON WILLIAMS: And one (1) of the conclusions -- I can take you there if you need, but I don't think I need to -- one (1) of the conclusions from the AMCL report was that Manitoba Hydro had completed eight (8), E-I-G-H-T, of the twenty-eight (28) recommendations, agreed?

MS. SARAH VINE: I'd have to double-check, but something like that, yes.

DR. BYRON WILLIAMS: Okay. You can certainly take that subject to check while I talk to Mr. Turner for a second. And page 5 of 184.

MS. KRISTA HALAYKO: This is Ms. Halayko. I'm -- I'm confident to say that it is eight (8), and there's nineteen (19) of the recommendations that are underway presently.

DR. BYRON WILLIAMS: Thank you. Mr. Turner, just because it's basically you, me, and Mr. Elder left, I -- I --

MR. HAL TURNER: Owen.

DR. BYRON WILLIAMS: -- and Mr. Oakley actually, you know, if you get into his resume, you'll see he's been around.

MR. HAL TURNER: I'll see Mr. Elder at

hockey on Thursday, so I can say hi to him too for you if you'd like.

DR. BYRON WILLIAMS: I want to take you for a second to Consumer Coalition 13 and, Mr. Turner, this was provided to your team by your legal counsel, I take it?

MR. HAL TURNER: That's correct.

DR. BYRON WILLIAMS: I'm not suggesting that you would have had -- memorized five (5) different Public Utility (sic) Board Orders, but you've at least had your -- a chance to familiarize yourself at a high level with this document, sir.

Is that correct?

MR. HAL TURNER: That is correct.

DR. BYRON WILLIAMS: And I just -- drawing your attention -- thank you, Ms. Schubert -- to Order number 116/'08, page 102.

Mr. Turner, at a high level, this is the Public Utilities Board suggesting that there was a need for Manitoba Hydro to undertake periodic asset condition assessments studies. Agreed, sir?

MR. HAL TURNER: Agreed.

DR. BYRON WILLIAMS: And if we flip to Order 5/12 and page 105 of that Order found in Exhibit Consumer Coalition 14, and you see the Public

Utilities Board four (4) years later again asking Manitoba Hydro to file an asset condition assessment.

Agreed, sir?

MR. HAL TURNER: Agreed.

DR. BYRON WILLIAMS: And if we go to 2016 Order -- so that two (2) over, Ms. Schubert, Order 59/'16, page 31 of 43.

You'll see again, sir, the Public Utilities Board in 2016 asking Manitoba Hydro to file a complete asset condition assessment for generation, transmission, distribution, sir. Agreed?

MR. HAL TURNER: Agreed.

MS. KRISTA HALAYKO: It's Ms. Halayko. I should also add that when we saw the aid to cross-examination, we endeavoured to look at all of these directives.

And it looks to be that the only directive related to asset management that's open presently is Directive 14 of Order 59/'18, and the other ones have either been superceded or closed. So I should add that --

DR. BYRON WILLIAMS: And I appreciate that --

MS. KRISTA HALAYKO: -- one related to asset management maturity assessment.

DR. BYRON WILLIAMS: And I certainly appreciate that, but you'll acknowledge that, over the course of eight (8) years, a number of General Rate Applications, the Public Utilities Board was repeatedly asking Manitoba Hydro to provide an asset condition assessment. Agreed?

MS. KRISTA HALAYKO: Agreed.

(BRIEF PAUSE)

DR. BYRON WILLIAMS: Ms. Vine, I want to turn you to the AMCL report, page 63. And you see here a listing of the UMS recommendations, agreed?

MS. SARAH VINE: Agreed.

DR. BYRON WILLIAMS: And AMCL's finding -- and again, you can always refer back to page 4 of -- of your report -- was that Manitoba Hydro had completed eight (8) of the recommendations, agreed?

MS. SARAH VINE: That's correct.

DR. BYRON WILLIAMS: In terms of the one that -- ones that Manitoba Hydro -- AMCL was of the view that Manitoba Hydro had not completed -- I'm not going to go through all twenty (20), just so -- but one (1) of them was task 16:

"Integrate O&M into the existing processes used for optimizing the capital spend."

Agreed?

MS. SARAH VINE: Agreed.

DR. BYRON WILLIAMS: And another one was 18:

"Establish AHIs for all key assets and transition to economic life to drive decisions."

Agreed?

MS. SARAH VINE: Agreed.

DR. BYRON WILLIAMS: So that's another one that wasn't completed in the view of AMCL?

MS. SARAH VINE: In -- in progress, that's correct.

DR. BYRON WILLIAMS: It was not completed at the time you were --

MS. SARAH VINE: It was not completed.

DR. BYRON WILLIAMS: And -- sorry, Ms. Halayko, you want to talk to Ms. Vine?

MS. KRISTA HALAYKO: Yes, please.

DR. BYRON WILLIAMS: Go ahead.

(BRIEF PAUSE)

THE CHAIRPERSON: Mr. Williams, for the record, do you want to put in what AHI stands for?

DR. BYRON WILLIAMS: Thank you. And that was going to be my question, Mr. Chair.

THE CHAIRPERSON: Okay.

DR. BYRON WILLIAMS: I was just trying to --

THE CHAIRPERSON: Yeah.

DR. BYRON WILLIAMS: -- thank you, though.

CONTINUED BY DR. BYRON WILLIAMS:

DR. BYRON WILLIAMS: And, Ms. Vine -- thank you to the Chair for their guidance. The acronym AHI is -- is short for asset health index, agreed?

MS. SARAH VINE: That's correct.

DR. BYRON WILLIAMS: And we'll come to what asset health indexes do in a little bit, but that's a standard term in -- in the -- in the profession?

MS. SARAH VINE: Yes, it is.

DR. BYRON WILLIAMS: Ms. Vine, I'm going to ask you to turn to Appendix A, AMCL, page 33.

MR. JIM PAWLUK: Excuse me, Mr.

Williams. I just want to back up to the one recommendation in there where it says:

"Develop a process to implement tools to address O&M spend and the tradeoff between O&M and capital."

We've given examples, like, in Grand Rapids turbine where we do that. We've identified what the O&M tradeoff is and -- and what we're doing there and increased O&M -- or the benefit of O&M by doing the capital. So to say that we don't have any processes would not be correct.

And, as well, when we look at our investments, and we've got it in our evidence that we look at whole life cost modelling, that also takes into impact of O&M spends on the capital investment and when the optimum time is.

So, we do have these processes in place, so. Maybe they're not fully developed all the way to where we want to get them, but to say we're not doing them would not be fair. And I just wanted the Panel to know that we are doing this work.

DR. BYRON WILLIAMS: Mr. Pawluk, thank you for that. Just you'll recall that my question to Ms. Vine was on actually recommendation 16, not 15.

Do you recall that, sir? But -- but

thank you for that.

MR. JIM PAWLUK: Sorry. But 16 is similar, and -- and it applies to both.

DR. BYRON WILLIAMS: And, Ms. Vine, AMCL, in terms of its scoring concluded that neither 15 or 16 were completed, agreed?

MS. SARAH VINE: Not completed.

DR. BYRON WILLIAMS: And in terms of integrating O&M into the existing processes used for optimizing capital spend, one of the concerns of AMCL is that the residual risk associated with unfunded capital investment needs or deferral of Cap X (phonetic) is not being reflected in the O&M budget, agreed?

MS. SARAH VINE: Agreed.

DR. BYRON WILLIAMS: Now, Ms. Vine, I want to take you to appendix A of the AMCL report, page 33, under the heading of, "Enterprise."

And, Ms. Vine, if I use the acronym GFAM (sic), you would understand that to the be the Global Forum on Maintenance and Asset Management?

I don't think your mic is on.

MS. SARAH VINE: That's correct.

DR. BYRON WILLIAMS: GFMAM. I apologize. That's the correct -- okay.

And the exercise that Manitoba -- that AMCL undertook is it examined thirty-nine (39) subjects defined by the GFMAM or asset management maturity, and it did so for the enterprise as a whole, as well as individual elements, like generation, transmission, distribution for electricity, and distribution for natural gas, agreed?

MS. SARAH VINE: That's correct, yes.

DR. BYRON WILLIAMS: And so, what we're looking at here in appendix A is at the enterprise level, the -- the big system level, agreed?

MS. SARAH VINE: Correct.

DR. BYRON WILLIAMS: And the maturity scale that AMCL uses, a score of 3 would indicate broad conformance with the ISO 5501 standard, agreed?

MS. SARAH VINE: That's correct.

DR. BYRON WILLIAMS: Okay. So, I want to take you through just a few of these subjects. And if I could ask Ms. Schubert to turn to page 38 under, "Resource management."

And in terms of resource management, Ms. Vine, AMCL, in terms of the maturity rating, gave a rating of 0.8, agreed?

MS. SARAH VINE: Agreed.

DR. BYRON WILLIAMS: And one (1) of

those reasons for doing so, one (1) of the bullets that you cite there, was that Manitoba Hydro did not have sufficient data available to develop the bottom-up resourcing strategy required to sustain current performance levels, agreed?

MS. SARAH VINE: Agreed.

DR. BYRON WILLIAMS: And when you talk about that kind of data, would it be sure -- would you be referring to the need to capture O&M, operation and maintenance, cost data at a greater level of granularity? Is that what you're speaking of here?

MS. SARAH VINE: Not necessarily cost data. So, one (1) of the things that we -- we ask or we look at is, if I took all of the planned work, so that the work that you are intending to do to your assets from a operations and maintenance perspective, a) is that the right amount of planned work, maintenance, proactive maintenance, and b) do you have enough capacity and enough people to be able to do that work as per the plan.

And -- and that was -- that was not overly clear.

DR. BYRON WILLIAMS: Thank you. If you could turn to page 41 under the subject matter, "Data and information management."

And under this subject heading in terms of maturity at the enterprise level, AMCL gave Hydro a score of 1.3. Is that right?

MS. SARAH VINE: That's correct.

DR. BYRON WILLIAMS: And in the fourth bullet to the right there's a suggestion by AMCL at the time of writing that there was a disconnect between strategic and operational decision-making and the data requirements to support it.

Do you see that reference?

MS. SARAH VINE: I do.

DR. BYRON WILLIAMS: And I wonder if you -- I could ask you just to briefly elaborate on -- on the -- the basis for that observation, please.

MS. SARAH VINE: What we're looking for is -- is line of sight again, and consistency. So, if a budget has been put together, tracking against that budget to a granular level is important, firstly, to know whether the budget was right and -- and your resources and assumptions were right and, also, to -- to know where you're underspending because everywhere you underspend, you're taking a risk.

So, the -- the top level decision on things like head count seems to be very disconnected from what you actually need to maintain your current

levels of service. It's the -- the decisions seem to be made independently.

DR. BYRON WILLIAMS: Thank you for that. I want to turn to -- to page 44. I'd apologize for this being kind of grindy, but I -- I think you love this, don't you?

MS. SARAH VINE: It's my job.

DR. BYRON WILLIAMS: Yeah. And it's a very important job, and we thank you for it. Under, "Risk assessment and management," AMCL gave Hydro a score of 1.11, agreed?

MS. SARAH VINE: Agreed.

DR. BYRON WILLIAMS: And there's a lot of bullets there on the right, agreed?

MS. SARAH VINE: Agreed.

DR. BYRON WILLIAMS: The -- the seventh one down, Ms. Schubert. Just one second.

Yes, the seventh one down, Ms. Vine, AMCL observes that current energy stream risk management practice focusses on asset failure risk instead of system failure.

That's the observation that AMCL made?

MS. SARAH VINE: That's correct.

DR. BYRON WILLIAMS: And I wonder if you can elaborate on what you mean by "a system

failure versus asset failure" and -- and the implications of this bullet, please.

MS. SARAH VINE: Okay. So, when -- when we talk about asset failure, we're generally referring to the -- the (INDISCERNIBLE) of the asset itself and the -- the response and the cost associated with getting to site and -- and repairing that asset.

What -- what we need to be doing in a more mature market is linking asset failure to service failure, so service to customers, and this is where we take a more systems approach.

So, not all assets are equal in their failure. It's -- it's dependent on the number of customers that are dependent on -- that are connected to that asset and a number of other things, like proximity to the nearest depot, which defines how quickly you can get there to repair the asset; whether the -- the asset itself is obsolete; whether you can repair -- repair it, replace it (INDISCERNIBLE) with like.

There are a number of factors that -- that define the -- the risk exposure to the business of an asset failure. So, it's not just about the asset itself, it's its purpose.

DR. BYRON WILLIAMS: And at the time

of the writing of this report your observation was that Manitoba Hydro was more focussed on asset failure rather than system failure?

MS. SARAH VINE: That's correct.

DR. BYRON WILLIAMS: I wonder if we can turn to page 46 under the headline, "Asset performance and health monitoring."

And we could talk about this all day, but I just want -- the score that you gave Manitoba Hydro on -- on this category was 1, agreed?

MS. SARAH VINE: Agreed. At a enterprise level, yes. I think from memory, at the energy streams level the -- the scores were higher.

DR. BYRON WILLIAMS: And would part of this score of 1.0 reflect that a lot of the data wasn't in the CMMS system or, no?

MS. SARAH VINE: Not necessarily in the CMMS system. What I couldn't see was a mechanism of taking all of the energy stream -- high energy stream, sorry -- I'm meaning distribution transmission.

And -- and plating that up to get a view of your overall organizational risk profile. And is it getting better, or worse?

So there's lots of -- lots of good

stuff going on at the asset level.

But corporately, it was hard to see whether the -- the risk was stable or deteriorating or -- or getting worse.

DR. BYRON WILLIAMS: Thank you.

MS. KRISTA HALAYKO: Could I just interject? I have the page number for the full assessment here. Maybe we could pull that up because Ms. Vine wasn't able to remember what the overall scores were. It's page 16 of this maturity assessment. I don't know if that -- that is helpful.

MS. SARAH VINE: It's not in colour.

DR. BYRON WILLIAMS: We're going to go back to the over -- we're going to go back to the override.

MS. KRISTA HALAYKO: Can you scroll down to 35?

(BRIEF PAUSE)

MS. SARAH VINE: Yes. So you can -- you can see on the subject 35, at the bottom there, the -- the scores in the energy streams levels are -- are substantially higher.

DR. BYRON WILLIAMS: But we're

operating this as a -- a system as a whole.

MS. SARAH VINE: That's correct.

DR. BYRON WILLIAMS: And there are fundamental decisions that need to be made at the -- at the -- at that level.

MS. SARAH VINE: Absolutely.

DR. BYRON WILLIAMS: Okay. Now if we could go in the AMCL report to page 4 of 184 and to the -- farther down this page. And -- and sadly, Ms. Vine, there's no colour.

But the Company average score, I want to highlight it in three (3) categories for you. One is asset information. The overall Company score was one-point-three-two (1.32), agreed?

MS. SARAH VINE: Agreed.

DR. BYRON WILLIAMS: And at -- for risk and review, that score was one-point-four-five (1.45), correct?

MS. SARAH VINE: Yes.

DR. BYRON WILLIAMS: And for asset management decision making, it was one-point-eight-three (1.83), agreed?

MS. SARAH VINE: Yes, that's correct.

DR. BYRON WILLIAMS: Ms. Vine, I take you to the reference, if you need it, at page 31 of

your report. Let's go there actually. Under -- under 'Priority Recommendations'.

And I'll just give you a second to read that first paragraph, Ms. Vine, okay? Just take a second and...

(BRIEF PAUSE)

DR. BYRON WILLIAMS: You've probably got it memorized.

The point that AMCL is making here under 'Priority Recommendations', you're highlighting the interdependency in terms of maturity between asset information, risk and review, and asset management decision making, agreed?

MS. SARAH VINE: Agreed.

DR. BYRON WILLIAMS: And one of the ultimate points you're making is that the ability to approve -- improve asset management decision making is highly dependent on risk and review, maturity, and on the asset information maturity, agreed?

MS. SARAH VINE: Agreed.

DR. BYRON WILLIAMS: And in the view of AMCL, it would be fair to say that a complete understanding of asset-related costs, risks, and

performance is reliant on adequate asset data, agreed?

MS. SARAH VINE: Agreed.

DR. BYRON WILLIAMS: Ms. Schubert, if you can turn to Consumer Coalition Information Request Manitoba Hydro 1-103, please. I think it's 'A'. Actually, could you just stay at the preamble for a second.

And Ms. Halayko, I want to orient you on this Information Request.

You -- you see in this Information Request, just by way of preamble, we're again referring in this Information Request to the interdependence between -- in terms of the maturity between asset information, risk and review, and asset management decision making, agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And Ms. Schubert, if you can go a couple pages in to wherever the question is. It's a lengthy preamble. Those Midgard people seem to ask very long preambles.

What -- what we're asking you to -- Manitoba Hydro to do -- and we certainly thank it for this answer -- is to discuss the main barriers to evolving its maturity and -- and identify some of its plans to overcome them.

Agreed, that's the thrust of this question?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And in terms of asset information, the Corporation was targeting to complete its first Asset Information Strategy in early 2023, agreed? That's at page 3 of 7 of this document.

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And, Ms. Halayko, is that done?

MS. KRISTA HALAYKO: I just was checking. But yes, agreed.

DR. BYRON WILLIAMS: And you may want to confer with your legal counsel on this one.

But is Manitoba Hydro prepared by way of undertaking to -- to file that? Or you may want to reflect on the -- the break, Mr. Czarnecki.

MR. BRENT CZARNECKI: I appreciate the opportunity to reflect on it. It -- it -- we are where we are in this process. I'm imagining we want the Board to have the best information possible. But it is coming in late, so we'll chat about it and we'll see.

DR. BYRON WILLIAMS: Okay. Thank you for your courtesy.

CONTINUED BY DR. BYRON WILLIAMS:

DR. BYRON WILLIAMS: On page 4 of 7, under 'Risk and Review Challenges and Barriers', I want to draw your attention to the fourth bullet.

And, Ms. Halayko, Hydro is -- in terms of -- it's identifying here current standardization gaps that limit the current comparability of risk across asset classes as including asset health indices, AHIs, asset criticality, risk analysis, risk evaluation, asset need scoring prioritization, and risk identification and monitoring. Agreed?

MS. KRISTA HALAYKO: Yes, that's what we're identifying.

When we took the UMS recommendations, they had recommended and -- they had recommended that we harmonize our processes across the different operating units. So transmission generation distribution.

And we've taken a full view of that. And what we had found is that we would like to standardize further across so that we can have a harmonized enterprise asset management system. So that's what this is speaking to.

DR. BYRON WILLIAMS: Thank you. And that's because to optimize across the -- the

enterprise, you have to have a good -- you have to address these gaps, agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: Ms. Vine, in terms of identifying gaps in terms of risk and review, does AMCL agree that these are the -- the big six (6)?

MS. SARAH VINE: That -- that would be the -- the ones that I would have picked, yes.

DR. BYRON WILLIAMS: Thank you. And I just want to -- either to -- to you or Ms. Halayko, in terms of asset criticality, what does that actually mean?

MS. SARAH VINE: Yeah. Sure. So asset -- the term "asset criticality" is used in two different ways, which does -- does cause confusion.

Some -- some people refer to critical assets as assets that are in a critical condition and near failure.

When, in an asset management context, a critical asset is one that is maybe a single point of failure or -- or its critical to the operation and delivery of service. So it's related to its importance, rather than its current operating state.

DR. BYRON WILLIAMS: And when you see that term, you believe it's referring to its

importance, agreed?

MS. SARAH VINE: It's importance, yes.

MS. KRISTA HALAYKO: That would be how we would interpret it as well.

I should also add that these are standardization gaps. So when we looked across our whole portfolio of assets at an enterprise view, we looked at where we had pockets of excellence and where we had areas that we had to improve. And we're really looking to standardize and bring everything up a level.

And the -- the ones that were excellent, we'll leave them be. But bringing up the whole harmonization of the enterprise system. So these were the standardization gaps. They're not necessarily gaps for all asset classes. But this is where it wasn't standard.

DR. BYRON WILLIAMS: And they pose as a barrier in terms of risk and review. Agreed?

You're trying to address these gaps because they cause a --

MS. KRISTA HALAYKO: Where -- in the pockets where they're not mature, yes, we could improve by having improvement in those areas.

DR. BYRON WILLIAMS: Okay. Under page

6 of 7, asset management decision making challenges and barriers.

Ms. Vine, you see the second bullet, Manitoba Hydro has suggested that data availability is low as -- as the CMS systems are varied and were not universally designed or implemented for asset management purposes. Agreed?

MS. SARAH VINE: Agreed.

DR. BYRON WILLIAMS: Do you agree with that observation by Manitoba Hydro?

MS. SARAH VINE: Yes, they -- they have a number of systems. They're all -- I think it was three (3) from memory, they're all configured slightly differently. And they're not all capturing the same level of detail and information about incidents and -- and failures.

DR. BYRON WILLIAMS: And we've already -- I think we've already talked about the alignment between the asset class strategy, so I'll leave that one. And, I thank you and Manitoba Hydro for assisting with that -- that answer.

Ms. Schubert --

MR. JIM PAWLUK: This -- this is Mr. Pawluk. I just want to add, like, on the data, we do have data. We do have data in our individual systems.

We're able to use the data for decision making and we are use -- able to use the data for risk assessments in the vein.

What we're trying to close the gap on, is an enterprise view of all the data and bring them all together. Like we -- we do have different systems that ran in different energy streams, which was applicable and appropriate at the time, but trying to look at an enterprise view of asset management and bring it all together, we've got to now cleanse and standardize the data and bring it all together.

And, it's not just a matter of saying the data is this and the data is that, it's making it consistent so that it's talking together. But as -- as far as being able to make decisions within our energy streams, we're still able to do that and we do have data for that.

DR. BYRON WILLIAMS: And we're going to go right there, Mr. Pawluk. So, let's go to Consumer Coalition Information Request of Manitoba Hydro 1-100.

And, again, to Ms. Halayko or Mr. Pawluk, in here we were asked to provide an assessment of asset health, index completeness for each asset class population, along with the discussion of

deficiencies. Agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And, we're going to come back to part A of the response in a moment, but I want to go to the table on the next page -- if Ms. Schubert will indulge us.

And, Ms. Halayko, I think your legal counsel advised you I might be giving you a very simple math -- math even -- you know --

MS. KRISTA HALAYKO: Yeah.

DR. BYRON WILLIAMS: --- even Mr. Peters, could handle this math problem perhaps.

MS. KRISTA HALAYKO: Of course.

DR. BYRON WILLIAMS: The -- but what you see here in the left-hand column are various asset classes ranging from generators to wood poles, et cetera. Agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And there's twenty-eight (28) categories or sub-categories, you'll accept, subject to checking my math?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: Okay. And, in the next column is the ones where asset health indexes have been established. Agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: The next one is where asset health indexes have been used for decision making. Correct?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: The fourth column is where they're implemented in CMMS. Correct?

MS. KRISTA HALAYKO: Yeah. Computerized Maintenance Management System.

DR. BYRON WILLIAMS: And -- thank you, 'cause I was just going to -- again, and then, the fourth -- the fifth column is where they're fit for purpose.

And, if we go -- if we can just scroll through at a high level, Ms. Halayko, in terms of where there are asset health indexes, there would be eleven (11) of the twenty-eight (28) without asset health indexes. Agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And, if we scroll down on this page, some of the ones without asset health indexes would include underground cable. Agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And on the next

page, those wood poles, there's no asset health index for them either. Correct?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: If we go to the next column asset health indexes used for decision making and go to the top, if you don't mind, Ms. Schubert.

Subject to check, there's nineteen (19) of these twenty-eight (28) categories where the asset health indexes are not used for decision making.

Would that be fair?

MS. KRISTA HALAYKO: That's fair.

DR. BYRON WILLIAMS: Okay. And going to the right, to the next column, in terms of CMMS, and if you could just remind me what it stands for again, if you don't mind.

MS. KRISTA HALAYKO: Computerized Maintenance Management System.

DR. BYRON WILLIAMS: In terms of the asset health indexes being implemented in the CMMS, there's two (2) of them that are -- have been implemented. Agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: Okay. And then if we look at a -- asset health indexes fit for

purposes, there's three (3) where you can say, unequivocally, they're fit for purpose. Agreed?

MS. KRISTA HALAYKO: There's three (3) yes's. Yes.

DR. BYRON WILLIAMS: And in six (6) other categories, some of the assets are fit for purpose.

MS. KRISTA HALAYKO: Correct.

DR. BYRON WILLIAMS: Okay, and generators might be -- would be one of those?

MS. KRISTA HALAYKO: Yes.

DR. BYRON WILLIAMS: Okay. And if we scroll down to HVDC Converter Transformers, there is a -- asset health index for them. Agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: But it's not used in decision making?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And it's not a CMMS. Agreed?

MS. KRISTA HALAYKO: No, it's not.

DR. BYRON WILLIAMS: And, of course, it's not fit for purpose?

MS. KRISTA HALAYKO: It also says, no. I should provide some context that when we did

reorganize, we created a -- a risk -- asset risk area. And they undertook this assessment.

And, as you can see, we've been very transparent here of our assessment. And what we found was that we had some very excellent pockets, if you look at station power transformers where we were doing, you know, advanced asset health indices.

But what we did was, we took a step back to see our asset health indices needed for all asset classes and how can we perform an overall assessment of our long-term plan.

And, so at that time we actually -- because we were working with AMCL, we asked AMCL if it would be appropriate to use age at this time, while we create a plan to harmonize our asset health indices and focus them on the assets that are actually complex enough to be needed. And, so that's where we're at right now.

We wanted to have all of our main asset classes, 90 percent of our BOC spending covered with some sort of a long-term plan, which we used age, which is seven (7) point -- Appendix 7.5. And this is showing our detailed analysis where we rooted out all of the areas where we're using them, where maybe, the fit for purpose means maybe we found some areas where

we didn't quite agree with how they were being used.

And now we're actually writing an asset health index standard. I don't think it's finalized yet, so I don't think we can enter it into evidence, but we're creating a standard to move forward.

MR. JIM PAWLUK: This is Mr. Pawluk. I'd like to also add, asset health indices is just one aspect for decision making, it's not the ultimate.

When we make a short-term investment decision and we put this in our evidence, we use condition assessments and -- and the condition of an asset is assessed before the investment is made.

The reason I'm bringing that up is, an indices is only give you a projection and it's a prediction, but it's not the ultimate decision maker. What it's helping us do is plan for long and medium term planning for our capital investments required.

But, it's not an ultimate decision maker. You'll still do a condition assessment of asset, before you'll intervene. There -- there's a lot of variables that will go into an asset health indices that can impact the life of an asset.

DR. BYRON WILLIAMS: I thank you both for that context.

In terms of being not fit for purpose,

that could be where they do not appear to accurately reflect the condition of the assets, for example.

MS. KRISTA HALAYKO: That's one of the cases. I think Midgard also pointed an instance that we had seen as well, where we -- I think we used the availability of spares in the asset health index, which is also not an appropriate use.

So, we did a thorough review to root out any areas where they weren't being used properly.

DR. BYRON WILLIAMS: And they could be inconsistent with other methodologies used elsewhere in the Corporation. Agreed?

MS. KRISTA HALAYKO: That's why we're creating a standard for asset health indices.

DR. BYRON WILLIAMS: Just one second please.

I'd like to direct the attention of Ms. Halayko -- I think it's you -- to Coalition Manitoba Hydro 1st Round Information Request 1-122 and Question (d) and it's a long Information Request, so -- and answer. I'll give you a second just to look at the question, Ms. Halayko.

(BRIEF PAUSE)

DR. BYRON WILLIAMS: Here you see the Consumers Coalition asking you to -- for all facility investments above, driven primarily by deteriorated asset condition, map the proposed expenditures against existing asset condition, project -- pre-project risk, and post-project risk, and -- and ensure that the probability is calculated for a specified consequence. For example, if the worst-case consequence is a failure at peak system load, provide that probability.

At -- at a high level, that's what this question is asking, right? Agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And Ms. Halayko, it's fair to say at the current state of asset management maturity that Manitoba Hydro is at, it's not at a level where specific project consequences in relation to peak or other loading conditions can be provided?

MS. KRISTA HALAYKO: I don't think that's correct. This is what we do in our Corporate Value Framework analysis. We look at the probability of a consequence occurring and we assign value measures -- we assign our value measures in that way and we do this rigorously for our investments.

DR. BYRON WILLIAMS: Can we go to the

response to (b), please? So, you'll see the -- that part of the answer on -- on -- which I'll suggest to you, Ms. Halayko, where you talk about the CF -- CVF model, but I'll just draw your attention to the last sentence on the next page.

And you'll see Manitoba Hydro's concluding that its asset management maturity is not at a level where specific project consequences in relation to peak or other loading conditions can be provided.

You're not at that stage right now, Ms. Palayko -- Halayko. Excuse me.

MS. KRISTA HALAYKO: I would say to that that that would be a very fine refinement of the analysis that we're doing and very difficult to do. That's my...

DR. BYRON WILLIAMS: Well, let's go a little higher, then. Let's go to PUB Manitoba Hydro 1-87, (a) to (d), please, and let's go to Question C.

Here you have the Public Utilities Board asking Manitoba Hydro to explain whether its refreshed 2023 SAMP will include scenarium (sic) analysis to assess the cost of service to relative levels of service to delivery which may, in -- in turn, inform different performance targets and revise

capital expenditure plans.

You see that question, Ms. Halayko?

MS. KRISTA HALAYKO: I do.

DR. BYRON WILLIAMS: And if we can turn to the response to that, please.

I am directing your attention, Ms. Halayko, to the -- starting at line 4, Manitoba's (sic) Hydro's response is that while cost of service to relative levels of service deliveries is a long-term goal of the AMP, it cannot be -- it's not anticipated it can be delivered in the initial one.

Agreed?

MS. KRISTA HALAYKO: Agreed.

DR. BYRON WILLIAMS: And, in Manitoba Hydro's view, making sound quantitative assessments of system performance, based on various resource inputs is, currently, demonstrative of a higher level of asset mat -- management maturity than Hydro currently holds. Agreed?

MS. KRISTA HALAYKO: Agreed. And I would submit that that's a very high level of asset management maturity, to be able to tie -- system performance is very much a lagging indicator on what you're doing on your assets.

So, to tie those two (2) thing together

is a very high level of asset management maturity.

I don't know if Ms. Vine has any comments on that.

MS. SARAH VINE: Yes, I can comment on that -- that's reminiscent of the level of maturity in the UK where they've been doing performance based regulation for twenty (20) years.

It's quite data hungry. It's -- it's hard work and it's very difficult to demonstrate that link directly between your investment and your level of performance. It's not a -- it's not a cause and effect, there's a lag.

DR. BYRON WILLIAMS: And, Ms. Vine, would it be fair to say -- actually, this is more for Ms. Halayko.

Would it be fair to say that the overall Capital Expenditure Plan of Manitoba Hydro is not currently an enterprise optimal plan?

MS. KRISTA HALAYKO: I'm not sure if that's fair to say. I'm just going to confer with my colleagues for one (1) second.

DR. BYRON WILLIAMS: And if you need a reference, you might want to go to Coalition Hydro 1-159, (a) to (c).

Mr. Fogg, you're up next, just for a

couple questions.

(BRIEF PAUSE)

MS. KRISTA HALAYKO: I'm back. So, I conferred with my colleagues and we are continually refining and doing the best with what we have at the moment.

So, the word "optimal", I think that is the ultimate goal, but that is -- I don't know that with a -- a company of this size that that is -- that's always what we're going to be striving for, but we're continually refining it, given our maturity at the moment and we're continually refining our maturity and...

DR. BYRON WILLIAMS: Thank you. And just -- I appreciate the thought that went into that answer. And just to go back to my original question just for a second.

It would be fair to say that the overall capital expenditure plan is not currently an enterprise wise optimal plan. Your own words.

Agreed?

MS. KRISTA HALAYKO: Based on my comments, I would say it's not optimal because optimal

is -- may not even be an achievable goal.

DR. BYRON WILLIAMS: Okay. Mr. Fogg, just a few questions for you. You've studied up on the Portage area capacity extension, sir?

MR. ALASTAIR FOGG: I've certainly done my best to study up on it, yes.

DR. BYRON WILLIAMS: And you -- and you obviously referenced it in your evidence yesterday?

MR. ALASTAIR FOGG: It was mentioned yesterday, yes.

DR. BYRON WILLIAMS: And at a high level, there -- without asking you to elaborate, just noting the time, there are some currently some capacity stresses -- stresses in the region between Portage/Southwest Manitoba?

MR. ALASTAIR FOGG: Southwest Manitoba needs some capacity enhancements to address the load in that area.

DR. BYRON WILLIAMS: And among the stresses in terms of capacity in that region, one (1) of the stresses is coming from increasing exports to Saskatchewan. Agreed?

(BRIEF PAUSE)

DR. BYRON WILLIAMS: It's in your CPJ, sir, if you need a reference.

MR. ALASTAIR FOGG: That -- there may be some contributing factors in relation to that, although, another driving factor is the -- the users in that area in -- in Manitoba.

DR. BYRON WILLIAMS: Right. And -- and among the -- there's new industrial customers that are putting stresses on that?

MR. ALASTAIR FOGG: That would be one (1) of those items.

DR. BYRON WILLIAMS: And one (1) of the objectives -- or Manitoba Hydro -- or one (1) of the concerns Manitoba Hydro was looking towards in terms of the portage area capacity extension, one (1) of the concerns was it was concerned about its capacity to connect new large industrial customers, that it was limited. Agreed?

MR. ALASTAIR FOGG: Subject to check, agreed.

DR. BYRON WILLIAMS: Mr. -- Mr. Fogg, just to direct you to your PowerPoint from -- from yesterday. Mr. Klassen will tell me the exhibit, or he better.

But slide 26, sir. And in this slide

you're making a comparison between business operational capital expenditures from -- from the most recent Manitoba Hydro forecast versus Capital Expenditure Forecast 2016, sir?

Is that right?

MR. ALASTAIR FOGG: That's correct. CEF-16 from the 2017 General Rate Application proceeding.

DR. BYRON WILLIAMS: And one of the points you were making, sir, was that in the first number of years, the expenditures in -- in 20 -- in C-23 are actually lower than CEF-16. Agreed?

MR. ALASTAIR FOGG: Agreed. They were -- they were lower and then you see in the later years, as Mr. Turner talked about yesterday, they increased for some of the sustainment requirements.

DR. BYRON WILLIAMS: And the overall gap results in C-23 being about 800 million more than CEF-16 over that comparable, sir, subject to check?

MR. ALASTAIR FOGG: I believe the accumulative change across the years we're showing is in the bottom right-hand corner, of six hundred and seventy-two (672).

DR. BYRON WILLIAMS: My mistake, thank you. Sir, my question to you was, in terms of C-23,

those first ten (10) years, would it be fair to suggest that that would include a projected expenditure for AMI, Advanced Metering Initiatives of 300 million, sir?

MR. ALASTAIR FOGG: I believe what we've noted is we've identified the potential for AMI as being within those forecasted expenditures. It's not an approved project at this time, of which we have a CIJ addendum.

We're currently in a business case phase of it, but we've identified it as a potential investment.

DR. BYRON WILLIAMS: Okay. But what I'm trying to just make sure --

MR. ALASTAIR FOGG: It would be incorporated within those first ten (10) years as you've noted.

DR. BYRON WILLIAMS: 300 million is there.

MR. ALASTAIR FOGG: It -- it would be accommodated within there. I can't identify for you that it's an approved project that has a CIJ.

MR. BYRON WILLIAMS: And just to make sure I'm clear, sir, when we look at C-23 as portrayed on this page, and over the first ten (10) years, one

(1) element of that is the projected, but not approved AMI Project. Agreed?

MR. ALASTAIR FOGG: It would be one of several that we've identified as projected investments. If -- if that project doesn't proceed, there may be other investments we make instead of that.

DR. BYRON WILLIAMS: Mr. Pawluk, you -- you're eager to jump in.

MR. JIM PAWLUK: Yeah, I -- I just, sorry, wanted to add that like AMI also offsets some other costs. If we were to implement and the business case was positive, one of the items included in that projection is the replacement of all the metres.

We replace metres on an annual basis. So, either you're going to do AMI or you're going to continue replacing metres. So, it's not a true just adding to the plan. There's other aspects that go into the plan that would be offset, so it's not a -- is the three hundred (300) fully in there? It -- it's included in the plan but we're going to do one or the other, so there's options.

DR. BYRON WILLIAMS: Right. And just so I'm clear, sir, you're not suggesting that replacing metres is a $300 million hit?

MR. JIM PAWLUK: No, I'm not.

DR. BYRON WILLIAMS: And, Mr. Fogg, in terms of the grid modernization not approved but potentially, that $180 million would be in that first --

MR. ALASTAIR FOGG: Similar to -- to the AMI situation. And just for context, AMI I think I just mentioned is in the business case phase of it. And AMI is quite a broad undertaking that considers much more than just what may be typically associated with it as demand response. But that's numerous aspects around reading meters. It has a number of operational benefits that may come with it if we choose to proceed with that.

DR. BYRON WILLIAMS: Thank you. And I do want to thank this panel. I just want to confer with my colleague, Mr. Klassen, just for one (1) second, Mr. Chair.

(BRIEF PAUSE)

DR. BYRON WILLIAMS: And strangely, I can confirm that I'm in on time, and so I thank Manitoba Hydro and Ms. Vine for your candor and your thoughtfulness, both in your information responses and

on the stand today. Thank you very much.

THE CHAIRPERSON: Thank you, Mr. Williams. We'll take the -- the morning break and reconvene at twenty (20) to 11:00. Thank you.

--- Upon recessing at 10:26 a.m.

--- Upon resuming at 10:44 a.m.

THE CHAIRPERSON: So Mr. Reimer, it's you. Please proceed.

CROSS-EXAMINATION BY MR. THOMAS REIMER:

MR. THOMAS REIMER: Thank you, Mr. Chair. Good morning. Good morning, members of the panel to my left and good morning members of the panel to my right.

My name is Thomas Reimer. I'm counsel for the GSS/GSM group. It is my first time appearing as a cross-examining lawyer for a panel. So if you notice a drop in the smoothness level from Mr. Williams, you will know why that is the case.

And -- and I will -- just so that it's not awkward when it happens -- acknowledge that partly because I'm a first timer, if it sounds like I'm asking a dumb question, it's very possible that I am.

So bear with me.

But as Mr. Turner knows, you miss 100 percent of the shots you don't take. So we'll -- we'll do our best. And so, with that bit of sandbagging out of the way, I'm going to start with you, Mr. Turner.

Again, full disclosure, my first time examining a panel in any forum. So obviously, you'll tell me if I'm directing my question to the wrong person. And occasionally, I'll just direct it to that side of the room and leave you to decide. But that's --

MR. HAL TURNER: That sounds great and I think you're going to do awesome.

MR. THOMAS REIMER: So I'll start with the rebuttal evidence of Manitoba Hydro. I'm at page 83 of 131. And I want to just zoom in on the concept of optimal economic life.

(BRIEF PAUSE)

MR. THOMAS REIMER: And the paragraph that I want to turn your attention to is -- it's in the middle of the page, about four (4) lines down:

"Obtaining optimal economic life for

a given asset requires that the asset is utilized until its lowest average life cycle cost of ownership is achieved, but not beyond."

Do you see that? And that's -- and that's certainly something that you agree with, sitting here today, as a -- as a description of what optimal economic life means?

MS. KRISTA HALAYKO: Agreed.

MR. THOMAS REIMER: And based on the explanation on the -- or on that description of optimal economic life, am I correct in stating that Manitoba Hydro is always seeking to achieve an asset management strategy that attempts to balance reliability and cost?

MS. KRISTA HALAYKO: We're balancing reliability and cost and risk.

MR. THOMAS REIMER: Thank you. And -- and sort of taking off on that, a reliable system will reduce the risk of disruption.

Is that an over-simplification or is that in the right ballpark?

MS. KRISTA HALAYKO: That's correct.

MR. THOMAS REIMER: And would I be correct to say that a perfectly reliable system would

never face any kind of disruption, is that right?

MS. KRISTA HALAYKO: That's correct.

MR. THOMAS REIMER: But implementing and maintaining a perfectly reliable system would be incredibly cost prohibitive.

MS. KRISTA HALAYKO: That's correct. If it's even possible.

MR. THOMAS REIMER: Fair. So there's always going to be some kind of trade-off between reliability and cost, right?

MS. KRISTA HALAYKO: True.

MR. THOMAS REIMER: And finding the optimal balance between cost and reliability and risk requires data about the assets in the system?

MS. KRISTA HALAYKO: That's correct.

MR. THOMAS REIMER: And Manitoba Hydro endeavours to make the most optimal decision in the execution of its asset management program by trying to strike -- I think I'm repeating myself here, but -- but I just want to make sure.

So the most optimal decision for executing the asset management program is one that strikes an optimal balance between cost, reliability, and risk. Do I have that right?

MS. KRISTA HALAYKO: That's correct.

MR. THOMAS REIMER: So -- and for instance, I think the -- the -- sort of the main question that this is getting at is whether to replace an asset or maintain it, right? That's the basic question.

MR. JIM PAWLUK: I would say it's one of the questions. It's -- it's the basic -- sorry, this is Mr. Pawluk.

It -- it is the basic question, but there could be more questions to it; like, there's refurbishment, there's replacement, there's maintenance. And then, there could be advancements in technology where the asset is no longer required or you upgrade.

So -- so in the basics, yes. But there -- there's other considerations.

MR. THOMAS REIMER: Thank you, Mr. Pawluk. And it will be a theme that I'm on the more simple side, and so feel free to nuance things as needed because I won't be able to do that myself.

Ms. Halayko made, what I thought was, a nice term of phrase yesterday. She talked about maintenance being managing degradation.

Do I have that right?

MS. KRISTA HALAYKO: Yes, that's

correct.

MR. THOMAS REIMER: And so, over time, assets deteriorate. That is the nature of being in an anthropic universe, right?

MS. KRISTA HALAYKO: Correct.

MR. THOMAS REIMER: I'm going to flip forward to PDF page 96, lines 3 to 10.

Sorry, Ms. Schubert, it's the PDF -- it's the PDF page that I've got for my citation. It's probably back a few. There we go.

And I'm looking at --

MS. KRISTA HALAYKO: Could I just ask what page that is in the document?

MR. THOMAS REIMER: Yes, I -- I think --

MS. KRISTA HALAYKO: Scroll to the bottom. Ninety-one (91)?

MR. THOMAS REIMER: Ninety-one (91).

MS. KRISTA HALAYKO: Okay. Thanks.

MR. THOMAS REIMER: I'm having trouble pulling it -- so I'm looking at, sorry, line 5. No, sorry, I'm looking at -- I am looking at line 3.

So Manitoba Hydro acknowledges here, at line 3, that:

"Improvements to asset information,

risk and review, and decision making are needed to further mature Manitoba Hydro's asset management system, which is common to comparable electric utilities."

My question is: What are the comparable electric utilities that are being referenced there, specifically?

MS. KRISTA HALAYKO: I think in my introduction I mentioned that I'm a member of the CEATI Asset Management Interest Group, which is an organization that is of utilities that are looking to advance their asset management, share best practices.

And so, members of that group that -- that I've been in conversation with would be BC Hydro, OPG; in the United States, TVA, Tacoma Power. Those are the big ones. There's -- there's forty (40) of them, but we have good relationships with them. And we're all experiencing similar challenges in advancing our asset management.

MR. THOMAS REIMER: Sorry, could you -- for the record, could you give me that acronym again in letters?

MS. KRISTA HALAYKO: C-E-A-T-I.

MR. THOMAS REIMER: Thank you.

MS. KRISTA HALAYKO: Centre for Energy Advancement Through Technology Innovation, I think.

MR. THOMAS REIMER: Okay.

MS. KRISTA HALAYKO: I'd have to confirm that.

MR. THOMAS REIMER: And so, the Canadian jurisdictions I heard on that list were BC Hydro and what was the other one?

MS. KRISTA HALAYKO: Ontario Power Generation.

MR. THOMAS REIMER: And --

MS. KRISTA HALAYKO: Also Nova Scotia Power.

(BRIEF PAUSE)

MR. THOMAS REIMER: And so, your understanding is that you -- that is, Manitoba Hydro is in a similar position, maturity-wise, to all four (4) of those Canadian jurisdictions that you just referenced?

MS. KRISTA HALAYKO: I would say that we're grappling with the same issues. Every organization is a little different, and some are ahead in some areas and have been at the asset management

maturity journey longer than we have.

But definitely information, and risk and review, and decision making are things that we discuss all the time. And some -- and we share because some of us are ahead in some areas and some are behind in some areas.

MR. THOMAS REIMER: Okay. And -- and are you able, sitting here today, to tell me who's ahead and who's behind Manitoba Hydro?

MS. KRISTA HALAYKO: I don't know if I can say on the actual maturity scores themselves because I think, as Ms. Vine had mentioned yesterday, sometimes those are confidential and they're not shared.

But just an example of where we're ahead is the Corporate Value Framework. We're always being asked for our experience and to collaborate. And right now, we're on a collaboration group for Corporate Value Framework with Bonneville Power and...

(BRIEF PAUSE)

MS. KRISTA HALAYKO: ...and Hydro One, sorry.

MR. THOMAS REIMER: I'll go back to

the concept of optimally -- oh, sorry, Mr. Pawluk.

MR. JIM PAWLUK: It's Mr. Pawluk. I just want to add that I've been in conversation with Newfoundland Power, as well, and they are quite behind where we are today, just to add.

MR. THOMAS REIMER: Thank you. So, going back to the concept of optimal economic life.

I hope I'm not mischaracterizing the admission from Manitoba Hydro that more and better information is required in order to mature its asset management system.

Is that a fair statement?

MS. KRISTA HALAYKO: Yes, that's true.

MR. THOMAS REIMER: Now, part of what the -- and -- and this starts at the beginning of -- of tab 7 of Manitoba Hydro's materials. I believe it's what started yesterday's PowerPoint.

Part of what we're doing on this Panel and on this issue is discussing the need that Manitoba Hydro has identified to increase BOC spending by about $200 million in the next ten (10) years.

Do I have that right?

MS. KRISTA HALAYKO: That's one (1) of the issues covered in -- in our tab 7 for sure, yes.

MR. THOMAS REIMER: And -- and so, the

question that I've got, and as a newcomer to utility regulation, you'll have to forgive me that I don't -- but in many contexts, you know, you see estimates that are sort of plus or minus, like, different -- there -- there are different categories of -- of projected costs on a particular project, for instance. That's an area that I'm familiar, okay.

Is there any sort of analysis, a plus or minus, when it comes to Hydro's projected costs when you're talking -- let's start with the ten (10) year time frame since that's -- the $200 million is attached to that time frame? Is there a plus or minus to that?

(BRIEF PAUSE)

MR. JIM PAWLUK: Mr. Pawluk.

MR. THOMAS REIMER: Yes.

MR. JIM PAWLUK: I'll take this one. For the capital plan there is not a plus or minus. That's a typical range that you would use in a specific project when you're going through estimates, but this is a capital plan at a high level.

We don't have every known investment identified. We know that they're aging assets. It's

trending in a direction where we're going to need to invest more capital, so it's not within an accuracy range. You -- you wouldn't do that at a portfolio plan level.

MR. THOMAS REIMER: Okay. Let me just explore that a little bit then, Mr. Pawluk.

Is there then a risk, and I'm using that in the colloquial sense, not necessarily as a term of art as you might, but is there a risk that it is over or understated?

MR. JIM PAWLUK: Yes, there is a risk that it could be over or understated. And Mr. Turner had brought that up yesterday in our direct evidence, that we're projecting 200 million. And as we advance in -- in asset management we'll be able to more refine what that number is, but it will always be -- it'll never be an exact number. There -- it's possible it could be 180. It's possible it could be 220, but it's going to range.

MR. THOMAS REIMER: And this goes back to Ms. Halayko's comment this morning about whether optimum, being the absolute best outcome, is actually an achievable target or just something you're going to be aspiring to for Manitoba Hydro's entire history and future. Is that fair?

MR. JIM PAWLUK: That -- that's fair. We going to get to optimum and make the best decisions when we actually do the investments, correct.

MR. THOMAS REIMER: And part of -- in -- part of the striving towards more optimal projections is getting the appropriate tools to collect and analyze data, right?

MR. JIM PAWLUK: That'll be one (1) of the tools to refine it. But when we look at our intervention rates and the age of our assets, this is known. Like, our assets aren't going to get younger just by doing asset management. They're -- they have a need today. And that need is only going to grow because they're only going to continue to age.

So, yes, we'll be able to refine the number as we go forward, but is it going to be -- are we going to be so far off that, you know, it's going to be huge? Probably not. Like, I mean -- and then there'll be other constraints that come in as we go into the future that, you know, we won't know about until we get there.

MR. THOMAS REIMER: Okay. So -- so, you're saying you -- it sounds to me, Mr. Pawluk, that you are reasonably confident that at least at the order of magnitude level, $200 million is correct?

MR. JIM PAWLUK: That is correct.

MR. THOMAS REIMER: Like, it's not going to be 2 billion and it's not going to be zero?

MR. JIM PAWLUK: That is correct. The zero for sure.

MS. KRISTA HALAYKO: I just want to add that I conferred with my colleagues. And in that $200 million we've tried to be conservative in that it's probably going to be, if anything, on the low side.

But because it's our projection of our long-term plan, we're being conservative at this point, and we'll refine further, but there's no indication that it's going to be significantly less than 200 million.

MR. THOMAS REIMER: Okay.

MR. ALASTAIR FOGG: Mr. -- Mr. Reimer --

MR. THOMAS REIMER: Yeah.

MR. ALASTAIR FOGG: -- it's Mr. Fogg. Maybe if I could add. I guess maybe we -- context kind of near term spending versus the longer term projection of our expenditures.

So, in the near term, I think we talked about briefly we -- we generally have specific

projects that are in that forecast. And those specific projects would go through a process where we assess risk or uncertainties that may have -- have a range of spending or expenditures associated with them.

On a portfolio basis we don't look it up, but it's project by project. As we look out over time, we're not -- we don't have specific projects that make up that entire portfolio. It's an anticipated spend based on asset health and other indicators.

As we approach that time frame, it'll -- we'll be looking to balance which projects proceed, balancing against financial decisions of that anticipated spending level that we projected.

So, there's a -- there's a balancing effort that goes in-between financial aspects in the actual projects and asset health that we need to spend, oh, in the -- the future years.

MR. THOMAS REIMER: Right. Thank you for that, Mr. Fogg.

The -- the thing that I'm trying to explore here though is you've projected a -- like, at the end of the day, you've projected a number. You've projected a number with at least order of magnitude

accuracy.

Ms. Halayko is -- is saying that -- that she expects it's on the conservative side and chances are it could be higher, right?

MS. KRISTA HALAYKO: I think that I -- I don't think it'll be much lower than that.

MR. THOMAS REIMER: Okay. I'm -- I am going to try and pin you down a little bit more than that, Ms. Halayko.

So, when you say it's a conservative number, what -- what that sounds to me is this is likely at the bottom end of the -- of the range, if I can use the word 'range'.

Is that -- are we using the word in the same way, 'conservative', the -- the word 'conservative'?

MS. KRISTA HALAYKO: Yes.

MR. THOMAS REIMER: And so, what then would you estimate -- are you in a position today to estimate if you took the other end of the range what that number would be?

(BRIEF PAUSE)

MS. KRISTA HALAYKO: I'm not at a

position to say right now. But I do know that we've only looked at 90 percent of our assets for the 90 percent, so we do have to firm up that extra 10 percent that's not in the projection and refine the projection itself.

MR. THOMAS REIMER: Slightly different vein. Am I correct that the quality of Manitoba Hydro's asset management data also informs the quality of its depreciation analysis?

Is that one for you, Mr. Fogg?

MR. ALASTAIR FOGG: I suspect it's one for me on that front. I would -- I would say that there -- there are differences between the data from a depreciation expense perspective and an asset health perspective.

And, in particular, the degree of information we may want on a granular basis, from an asset health perspective, may be much more detailed than is required from a depreciation expense perspective, recognizing that depreciation is -- is an estimate of -- to capture those capital expenditures and express them over -- over time.

So, there -- there would be differentiation between those -- those two (2). I wouldn't suggest that our asset information is

impacting negatively our depreciation expense estimate.

MR. THOMAS REIMER: And -- and Mr. Peters and you had a discussion yesterday about what -- I can't remember what your terminology was, but you -- you agreed that there appears to be some correlation between -- between asset health and depreciation, and when you look at the numbers, there's a -- there's a similar trend at play.

Do I have that right?

MR. ALASTAIR FOGG: I think it's -- what you would see is there -- there's some relationship or alignment between business -- the expenditures around business operations capital and that depreciation expense, not asset health necessarily.

MR. THOMAS REIMER: Okay.

MR. ALASTAIR FOGG: So, depreciation, again, is the recognition of what we previously spent on the business operations capital over time. And since historically business operations capital has been -- we've seen that in the general range, that's why you see an alignment between what we're spending today on assets versus what we spent previously which is being recognized in depreciation expense.

MR. THOMAS REIMER: Thank you. I think this one -- this might be for Mr. Turner.

I'm going to talk a little bit about the UMS Group assessment. I'm not going to do it in any detail, but I wonder if you could advise the Board, what was the reaction when Manitoba Hydro received the UMS Group assessment, the one point five (1.5) maturity score?

(BRIEF PAUSE)

MR. HAL TURNER: At the time, I think it was 2015, so I would have been managing Project Management Group, so we would have been executing a lot of the capital. I would say overall we -- we felt it was a fair assessment of where we were at.

MR. THOMAS REIMER: Did it -- was it cause for concern?

MR. HAL TURNER: I don't know if I would go so far as to say "cause for concern". I mean, we certainly strive to do the best job possible, and -- and it would have been -- you know, there were certainly areas where we needed to improve, but I'm not sure I would go so far as to say "cause for concern".

MR. THOMAS REIMER: If you look at Order 59/'18 -- I think I'm at page 107 of the PDF, I hope. So this is the Board's synopsis of Manitoba Hydro's position. And -- sorry, I'm going to have to look at my...

(BRIEF PAUSE)

MR. THOMAS REIMER: So the second sentence:

> "While the utility is developing more advanced and mature asset management processes, it reports that it is at least three (3) to five (5) years away from being in a position to use these processes in developing its capital expenditure forecast."

Did the Board accurately capture Manitoba Hydro's position at the time that it wrote this Order?

MR. HAL TURNER: You know, I'm -- it's -- 2018 was about five (5) years ago, so I'm going to -- I won't remember exactly which processes they were referring to, so I'm going to say, yes, subject to

check.

MR. THOMAS REIMER: Sure. And is Manitoba Hydro where it thought it would be today when it made those submissions back in 2017/2018?

MR. HAL TURNER: At the time, we wouldn't have foreseen that we were going to undertake a significant business model review and restructuring. So I think, in general, we wouldn't have envisioned where we are today.

We're -- we're a very -- we're organized very differently. You know, we've organized around asset management, so we wouldn't have anticipated being where we are right now.

MR. THOMAS REIMER: So I'm going to ask -- I -- I hear -- I hear what you're saying. I'm going to ask a question. So -- let me start over.

When you made that submission, in other words, Mr. Turner, you didn't anticipate the restructuring that was going to happen internally at Manitoba Hydro. Is that what you're saying?

MR. HAL TURNER: That's correct, and the -- you know, maybe for the Board's benefit, the restructuring was very consuming, so we would have paused our specific work on advancing some of asset management maturity while we worked through the

process to try and identify the best possible business model and organizational structure.

You know, we also tried to do this in parallel with a global pandemic, so that -- that made things a little bit more challenging. So we -- we would have slowed things down from a process perspective to focus on our business model, and -- and so that's what I meant by that, that it -- you know, it had an impact on how we've evolved and how we've moved things forward, not just that we didn't anticipate how we would be organized.

I will say -- and I mentioned this in my direct evidence yesterday -- I -- I am very optimistic that this new structure is going to yield an improvement in our rate of maturing our asset management system.

We are joined by some very bright minds behind me and over to my left here that are -- is the future of asset management at Manitoba Hydro, and I'm very confident they're going to move things forward in an expedited manner.

MS. KRISTA HALAYKO: I think it might be worth restating, too, that our reorganization was around an asset management model. So it may have slowed down progress somewhat, but it really is

positioning us to do more with asset management going forward. Like that was one of the goals of the reorganization that Mr. Turner mentioned.

MR. THOMAS REIMER: Right, but -- but I guess my more simple question is: When you made the submissions at the last GRA, you expected you would be able to use the more mature decision-making processes for capital expenditure forecasts I would expect for -- for a time period like at this GRA.

And -- and if I understand the evidence correctly, you have not used the more mature asset management processes for C-23, if I understood Mr. Fogg's evidence correctly yesterday.

MR. HAL TURNER: So, Mr. Reimer, I mean, you know, we've -- we've implemented Copperleaf I guess as it's now called across the enterprise, so that would have been something we were contemplating in -- in 2018. And that's complete and is being used.

So, I don't think it's fair to say we haven't done all of that, but I will -- you know, as I -- as I've said, there -- we're in a very different place. But certainly some of this we have done.

MR. THOMAS REIMER: If you scroll down, Ms. Schubert, please, to page 110, this is the Board's findings on this point. And the Board here

identified the need...

(BRIEF PAUSE)

MR. THOMAS REIMER: So the Board here, if I'm interpreting this correctly -- and you can tell me if -- if you have a different interpretation, the Board effectively made its Order on rates essentially taking $160 million out of the ask.

And obviously, as we discussed last week and -- and my friend Mr. Czarnecki redirected Ms. Grewal on this point, Manitoba Hydro spends the money it gets -- essentially, it has the discretion to spend the money it gets. The Board doesn't tell it specifically where to spend which dollars, right?

Do I have that right?

MR. HAL TURNER: That's correct.

MR. THOMAS REIMER: But in this case, the Board said, You haven't provided sufficient evidence to us to establish that the full amount that you're asking for is needed, and we're going to reduce $160 million, right? And go ahead and take -- take a moment if you need to -- to read the second paragraph.

MR. HAL TURNER: I think that's correct.

MR. THOMAS REIMER: And part of the reason it did that was it said -- and this is six (6) lines into that second paragraph, "This is -- " it says:

> "This is consistent with the Board's findings in Order 73/'15 that Manitoba Hydro has not adequately evaluated the long-term pacing and prior -- prioritization requirements for business operations capital spending."

And -- and I interpret that to be a reference to the asset management system that Manitoba Hydro has.

Do you agree with that?

MR. HAL TURNER: Are you asking me if I agree with how you interpret it?

MR. THOMAS REIMER: Yes.

(BRIEF PAUSE)

MR. HAL TURNER: Sorry, Mr. Reimer. I'm -- I'm -- maybe I need you to -- I apologize. Maybe you -- you wouldn't mind restating the question. I mean, we've -- I'm not -- I'm -- it's not clear to

me what you're asking, so.

MR. THOMAS REIMER: So -- so the PUB -- and -- and we don't need to spend a lot of time here, so I'll move on if -- if I'm not able to communicate my question properly this try.

The Board has said in this paragraph, We're reducing the amount for business operations capital by 160 million, and then at that para -- that sentence that I read talks about Manitoba Hydro:

> "...not adequately evaluating the long-term pacing and prioritization requirements for business operations capital spending."

And I'm suggesting to you that when it talks about "pacing and prioritization requirements for business operations capital spending", that's a reference to asset management.

MR. HAL TURNER: Agreed.

MR. THOMAS REIMER: And -- and so the concern that the PUB had when it made this Order was that there wasn't an adequate evaluation of asset management factors. Right? I'm paraphrasing, but are you willing to go there with me?

MR. HAL TURNER: Sure. Agreed.

MR. THOMAS REIMER: And the question

that I've got then is: What is different on this GRA, given that you're not using the more sophisticated asset management tools, to what was happening at the 2018 GRA?

(BRIEF PAUSE)

MR. HAL TURNER: Sorry, Mr. Reimer, I -- I -- I'm -- I just want to make sure I answer your question. Would you please re-state that so I --

MR. THOMAS REIMER: Yeah. So, so my understanding, based -- I believe it was on Mr. Fogg's evidence yesterday, was that the -- is it BCV? What's -- what's the acronym?

MR. HAL TURNER: CVF?

MR. THOMAS REIMER: CVF. Thank you.

MR. HAL TURNER: Corporate Value Framework.

MR. THOMAS REIMER: Thank you. C -- the Corporate Value Framework. I speak this language with an accent, if I speak it at all, so thank you for bearing with me on that one.

I understood that the CVF, and other asset management tools that are in development, were not used to prepare the expenditure forecast that was

provided. And I think it's referred to as C-23 in the materials.

MR. HAL TURNER: So, I'll -- I'll take a stab at this and then my colleague may want to jump in.

I think -- so one of the things, the difference -- is different with this GRA is we have a long-term forecast of our capital needs. It was Appendix 5 in tab 7 that was based on a -- an analysis of the -- or the population of our assets.

And then we use Copperleaf and the Corporate Value Framework tool for our short-term planning. So, in the near years, determining, you know, which investments should proceed and at what time and also it can inform the scope of the investments.

So, we don't use CV -- the Copperleaf for the long-term projection. We've done that, as I mentioned, it's at Appendix 5 at tab 7 does that. But we use the CVF in the short term. That -- did I answer your question, Mr. Reimer?

MR. THOMAS REIMER: You did. Very well. So, so in other words you -- you actually do have more confidence this time around than you did back in 2018, is that what you're saying?

MR. HAL TURNER: That's correct.

MS. KRISTA HALAYKO: I should add as well, that the Corporate Value Framework tool, although it was in use in -- in 2018, for the short-term planning as well, we have done a lot of advancements in terms of standardizing its application, having guidelines and collaborating with other utilities. So, that part of it has also improved.

And when I look at this I see pacing and prioritization. So, pacing would be -- I would interpret that to mean the long-term planning that Mr. Turner talked about in our Appendix 7.5. And prioritization would be more of a short term. We would call it optimization of the portfolio, but that would be in the Corporate Value Framework using Copperleaf.

So, we have made improvements in both those areas since the last --

MR. THOMAS REIMER: And this -- and just to be -- make sure that -- I'm a little slow on the uptake here, but the CVF is used for the short term in the Copperleaf system?

MS. KRISTA HALAYKO: That's correct.

MR. JIM PAWLUK: Excuse me, it's Mr.

Pawluk. I'd also like to add in Appendix 7.5 is we have rates. Rates of intervention. So there is pacing in that analysis.

MR. THOMAS REIMER: You were directed by the PUB to retain an asset management consultant to assist with developing asset management processes that would enable you to objectively prioritize and optimize spending. Right? Do you recall that? And I can direct you to the --

MS. KRISTA HALAYKO: Yeah, I think it might be at -- is it at the bottom of this page?

MR. THOMAS REIMER: Or -- yes. So it's the last paragraph of page 112 of 316.

MS. KRISTA HALAYKO: We hired a consultant to perform an assessment of our asset management maturity. I think you had said develop processes. They didn't do that, but they --

MR. THOMAS REIMER: Okay.

MS. KRISTA HALAYKO: -- they did an assessment of our maturity.

MR. THOMAS REIMER: Fair. Thank you. And, I believe, Manitoba Hydro complied with that by way of the document that's in Appendix 9-9. Is that right? Ms. Schubert, if you would be so kind -- thank you.

So, this is a letter to Mr. -- to Dr. Christle from your counsel I believe dated August 29, 2018, enclosing the terms of reference.

Do I have that right?

MS. KRISTA HALAYKO: That's correct. And the maturity assessment report itself is one of the tabs in tab 7. I can't recall which one right now.

MR. THOMAS REIMER: And we're going to get that in a second, but I just want to sort of pin down the time line here so.

This is August 2018 and the terms of reference are -- are -- are prepared and filed and if you scroll down, Ms. Schubert, to the last page you'll see that at Appendix 9-9, in the second paragraph, you're expecting the -- the assessment to take approximately six (6) to twelve (12) months.

MS. KRISTA HALAYKO: Correct.

MR. THOMAS REIMER: And the report that came out of these terms of reference, if I understand correctly, is the AMCL issued report dated October 24, 2022.

MS. KRISTA HALAYKO: That's correct.

MR. THOMAS REIMER: So, do you have an explanation for why -- when you -- initially expected

six (6) to twelve (12) months, and I realize -- so COVID is going to be part -- part of the answer. I'm -- I'm expecting, but COVID doesn't come around until early 2020.

So, so there's at least -- so the six (6) to twelve (12) months that's projected in that letter, or in that -- the terms of reference, come before COVID.

So, could you provide an explanation for why it took significantly longer to get the AMCL report?

MR. HAL TURNER: Ms. Schubert, could you just scroll back up to the date of the letter please? Sorry. Thank you.

So, yes, we -- obviously we didn't start on this right away. There were a number of factors. Our CEO started in early 2019. A new CEO, so where we started working on our Strategy 2040 and subsequent business model review.

So, we anticipated there may be some changes that are coming and -- and felt it would be best to wait until we were through that.

MR. THOMAS REIMER: I'm going to switch gears a little bit and just -- I -- I think this goes without saying, but, you know, simple

questions for me.

I take it -- you -- you're going to agree with me that if Manitoba Hydro is faced with a known or developing risk to the conditions of its assets, that Manitoba Hydro is going to address those risks regardless of whether the risk was forecast in the test period or not.

MS. KRISTA HALAYKO: That's correct.

MR. THOMAS REIMER: And the corollary to that is just because you projected spending a certain amount of money, it turns out you didn't have to spend the money, you're not just going to spend it 'cause you projected you'd spend it.

MS. KRISTA HALAYKO: That's true.

MR. THOMAS REIMER: And this goes back to the -- optimal economic life concept. Assets are only replaced when that's the most economically optimal option.

MS. KRISTA HALAYKO: I think I have to disagree with that because we -- as we showed in Appendix 7.5, we're replacing assets far beyond their optimal economic life in some cases.

That's our goal, for sure, but that's not the reality right now.

MR. THOMAS REIMER: I -- I see. Thank

you. Your goal is to do what I said, but you're saying in reality the -- the goal isn't achievable because of constrained resources, whether human resources or financial resources.

MS. KRISTA HALAYKO: That's correct.

(BRIEF PAUSE)

MR. THOMAS REIMER: I'm not sure who this one should go to, but this is about consultation with customers and -- and if I've missed this in the evidence, I apologize, but do you consult with customers by rate class in any -- in any formal way at least?

MS. TANIS BRAKO: Yeah, this is Ms. -- Ms. Brako speaking. So, as part of the presentation of direct evidence in this panel, I had given an overview about the account management that we have in place.

So the structure is that we have key account officers that look after our portfolio of our largest consumers in the province. And then we also have major account representatives who look after -- there's between 250 and 300 customers that they maintain, you know, a portfolio of relationships with

those customers from the time that they connect to the time that they're no longer a customer, if that's helpful or if -- if there's other --

MR. THOMAS REIMER: It is.

MS. TANIS BRAKO: -- information you're seeking.

MR. THOMAS REIMER: I'm going to follow -- I'm going to follow up, but that sounds to me like it -- like not necessarily a formal or methodical data proc -- data collection process.

You're -- you're just dealing with your accounts and -- and you're -- you take that in and you -- and your account managers or representatives deal with the complaints as they come in.

What -- what -- what are you doing to co-ordinate or -- or organize that information?

MS. TANIS BRAKO: Yeah. So, it -- it's more proactive than what you described, especially for the major account customers and key account customers.

So, we have meetings, on a regular basis, with your customers, and it depends, you know, how -- how active a customer might be. So, if a customer is, say, looking at an expansion project,

we'll be meeting with them on a very regular basis to understand how their project is going.

With our large industrials, we're in contact with them on a regular basis, about many different topics, you know, rates being one of them, is something that comes up, you know, typically annually, as -- as they're doing their financial forecasting but, also, reliability, contract issues, et cetera.

MR. THOMAS REIMER: Okay. So -- so, let me -- let me pause you there, if that's okay, and -- and just say, like I -- I take it there's no dispute at Manitoba Hydro that -- that different customers, both within the classes but also different classes of customers, have different appetites for cost increases or reliability concerns, right, like they -- like they -- they're -- you have a -- a diverse or disparate customer base.

MS. TANIS BRAKO: Absolutely.

MR. THOMAS REIMER: And -- and so, the -- the follow-up question to that is, we saw, yesterday, the -- the slide that had, I believe it was more on the residential side, but -- but customers leaning towards reliability over cost.

Do you recall that?

MS. TANIS BRAKO: Yes.

MR. THOMAS REIMER: Do you have something similar when it comes to the commercial and industrial customers that you have?

MS. TANIS BRAKO: Thank you for asking. So, this is something that we have identified as a gap, in the research that we have been doing over the many years that the CSTS has been ongoing.

So, you're right. The CSTS asks residential customers of, you know, many different topics related to the services that we offer, but there's a gap. We don't have a formal survey that goes to commercial and industrial customers that ask the same thing.

So, we have, again, like I mentioned, identified that as a gap, again, this is through Strategy 2040. We know that we need to have a better understanding of the evolving energy needs of our customers.

So, we did just start doing a survey. So, it's a voice of the customer survey for our major Work Order process. So, that's any new service connection. It's a large, complex project, essentially.

GSS and GSM customers would be part of

that process, as they're connecting or expanding their operations, and we're asking customers, you know, how that process goes for them, is it easy to do business with Manitoba Hydro, what's their satisfaction levels of the duration of that service, but, then, additionally, what we are starting, as well, is a major accounts customer satisfaction study, and we expect to have first results of that in Q. 2 of this year.

MR. THOMAS REIMER: Okay. So, the next time we're having this conversation, you will have more information for me?

MS. TANIS BRAKO: Absolutely.

MR. THOMAS REIMER: Okay.

MS. TANIS BRAKO: Yeah.

MR. THOMAS REIMER: This is a kind of a -- a one-off question. If you look at Tab 7 -- I'm on page 2451. I didn't understand how the Asset Management Division interacts with the Centre of Expertise.

Can -- can somebody help me out with -- with that? So, at the top, the newly formed Asset Management Division, and then -- and then the Centre of Expertise is referenced as well and I -- and I don't quite understand whether they are the same thing

or whether one is sort of the umbrella under which the other acts.

MS. KRISTA HALAYKO: It's Ms. Halayko. I would say it's one and the same really.

MR. THOMAS REIMER: Thank you.

MS. KRISTA HALAYKO: Having all the experts assembled in one division is -- is the -- one and the same.

MR. THOMAS REIMER: So, one thing that I'm having trouble with understanding is -- and -- and I'll go back to the first page of -- of tab 7, if you would, Ms. Schubert.

There's a reference -- it may be an oblique reference here, but I understood that one of the -- the indicators that Manitoba Hydro is relying on to make the point that it needs more BOC spending is that the SAIFI and SAIDI num -- results are -- are deteriorating.

Do I have that right? Is that for you, Mr. Pawluk?

MR. JIM PAWLUK: Yeah, I can take that. That is one (1) of the indicators. We're seeing declining performance in all of our assets and that is typically a distribution metric, but it is declining.

MR. THOMAS REIMER: And the -- and -- and I think you described it as a lagging indicator yesterday. So -- so the -- the performance of the system as indicated by SAIFI and SAIDI is actually worse today than it is based on those factors.

Did I understand your evidence correctly?

MR. JIM PAWLUK: We're trending in a direction of declining performance, yes.

MR. THOMAS REIMER: And -- and the question that I've got -- and -- and if I understood somewhere else, and I -- I don't think we need to go there, although I can pull a citation if you need.

But I understood that the goal of Manitoba Hydro is essentially to maintain the SAIDI and SAIFI numbers that it had between 2014 and 2018.

Do I have that right?

MR. JIM PAWLUK: It's based on a five-year average, and that's the five (5) year average of that data, correct.

MR. THOMAS REIMER: And so the question I've got then is the BOC spending really only ramps up, I think, in 2027, something like. Right, Mr. Fogg? I mean, we can go to your presentation yesterday. I think it's page 21 -- sorry, 26.

And Mr. Peters took, I believe it was Mr. Fogg through this and -- and it's -- again, not only am I new to the process, I'm an English major, so, you know, I've got a lot working against me here.

But, I -- I think I understood the -- the evidence of Mr. Fogg to be the increase in BOC spending is actually projected really to kick in. And I think those are what those paran -- parenthetical numbers on the right-hand two (2) columns refer to or the second from the right I suppose.

So, am I -- am I understanding it correctly, the BOC spending ramps up in 2027/'28 and then it goes up from there?

MR. JIM PAWLUK: That really wouldn't be correct --

MR. THOMAS REIMER: Okay.

MR. JIM PAWLUK: -- because you're -- you're comparing two (2) plans to each other. But our plan is to start the ramp-up in I believe it's 2026 --

MR. THOMAS REIMER: Okay.

MR. JIM PAWLUK: -- and then gradually ramp it up to the 200 million. It -- it's done over about eight (8) years. We -- we can't just ramp up to 200 million in a -- in a year. That's just not possible.

MR. ALASTAIR FOGG: Mr. -- Mr. Reimer, if you -- it's Mr. Fogg. If you go to two (2) slides earlier, slide 24, I believe would show just the C-23 plan and maybe visually some of that increase in business operations capital is -- is more evident in that graphic, just on its own.

MR. THOMAS REIMER: That's helpful.

(BRIEF PAUSE)

MR. THOMAS REIMER: I apologize and I guess the thing that I'm having trouble with is that Mr. Fogg's evidence yesterday was that for C-23, the most sophisticated asset management tools were not used for C-23, at least for the long-term projections.

Did I get that right?

MR. ALASTAIR FOGG: I apologize. I don't -- I'm not sure if I ever recall mentioning asset management tools when -- when I was discussing -- I think what I was trying to differentiate was the iden -- as we talked about earlier this -- in our -- in discussion, the difference between early years with specific projects being approved and that was optimized via the CVF versus the long-term forecasts are based on asset health projections.

MR. THOMAS REIMER: Right and -- and that's -- and those projections are based on the same processes that you had in place at the last GRA?

MR. ALASTAIR FOGG: And in that specific point what I was trying to clarify was that there's been some evidence presented that there's less accuracy or less detail in the C-23 plan from a -- a long-term planning perspective versus CEF-16 and I was trying to differentiate that.

No different than in CF-16 and C-23, but when you look out, excuse me, ten (10) or twenty (20) years, we plan at a -- at a portfolio level, not a specific project level.

That's no different in this forecast than it was previously. That's not to sugges -- I wasn't meaning to get into the specific approaches of better or -- or not asset management information in that regard.

MR. THOMAS REIMER: So, to -- to -- maybe I'll try and elaborate or clarify that further.

CEF-16, when we look out ten (10) and twenty (20) years, what I was trying to highlight in that slide, if we go to -- 26 -- 27.

In CEF-16 in the early years of that forecast, the majority of the spending is identified

as executing projects. And those are specific projects that we've identified where wer -- there's spend occurring.

There's also programs that are occurring in that same time frame. When you move out to the ten (10) year total or twenty (20) year total, we're not identifying specific projects in a CIJ addendum at that time frame.

What we're saying is we're looking at -- at a portfolio or a set of planning investments. So, it's kind -- it's at a high-level spend and that's where you see the bulk of the spending for the twenty (20) year total, on that line called planning investment.

That's the same approach that would be taken here in C-23. That portfolio adjustment's line is where we're looking at portfolio spending in the future time frame. We're not identifying specific projects A, B, or C, twenty (20) years in the future that we can spend on.

(BRIEF PAUSE)

MR. ALASTAIR FOGG: And just maybe for -- for context, too often what happens is you'll --

you'll just project previous -- and CF-16 you may take previous spending and just project it based on inflation, or a 2 percent escalator from near-term spending to get that portfolio.

What we've tried to do in C-23 is, also as the rest of the panel has described, really look at asset health and the degradation of those assets to say what -- how would spending have to change to meet that degradation in the asset health.

MR. THOMAS REIMER: But -- but -- and I -- and I'd like to move on in a second, but just to understand, one (1) of the things I understood Ms. Halayko to talk about was that because you haven't brought online your asset management tools for the long-term, the -- the factor that you're primarily relying on is age of asset?

MR. ALASTAIR FOGG: It's primarily age of asset, which is a source of information. I think what Mr. Halayko was trying to describe is we can have -- as we mature further that information becomes better, but the age information is valid information to base it on today.

And what I was trying to distinguish was in CEF-16 it may -- subject to check, may have just been an escalator from earlier spending without

even incorporation of that age information.

What we're trying to do is take that age information into account in C-23 and that forecast today, recognizing that as we mature that information becomes better, but it is still valid information right now.

MR. THOMAS REIMER: Okay. I'd like to move on. I -- I can see two (2) people with their fingers on their button.

THE CHAIRPERSON: Mr. Reimer, you've got eight (8) minutes.

MR. THOMAS REIMER: Thank you, yes. I'm -- I'm keeping an eye on it.

MS. KRISTA HALAYKO: I would just like to add though that having that assessment that was done in appendix 7.5 is an increase in our asset management maturity. The fact that we're including that now, and projecting out with more detail then maybe doing what we can with what we're given.

CONTINUED BY MR. THOMAS REIMER:

MR. THOMAS REIMER: Ms. Vine --

MS. KRISTA HALAYKO: So we're projecting what the assets need rather than what we're given. And so, it's a -- a bottom-up and top-down

approach.

MR. THOMAS REIMER: Can I go to the AMCL slide deck from yesterday, Ms. Schubert.

I'm at slide, I think it's 7 -- sorry, it's 6. And -- and, Ms. Vine, I just want to -- the -- the transcript said -- you pointed to 2.13, 2.09, and 2.04 -- sorry, 05 on the organization in people, strategy and planning, and then the life cycle delivery scores.

The transcript said you used the word "barely consistent with industry." I just wonder -- I -- if -- if you can either correct that or -- or let me know what you meant by "barely consistent"?

MS. SARAH VINE: I think I said mostly or largely consistent within industry.

MR. THOMAS REIMER: Thank you. I assumed that it was something different. And what about the lower scoring areas, so I'm looking especially at 1.32 acid information.

Would that be lower than industry --

MS. SARAH VINE: No. I -- so, we have a -- a benchmarking database that contains over two hundred (200) assessments that we've done around the world. And what I look for is -- is the pattern. And asset information is generally a very low scoring area

for everyone.

The information technology's moving forward. Things that were -- were kind of adequate and acceptable years ago are now out of date. This technology moves on.

I used to do net present value calculations with a pen and paper and a --

MR. THOMAS REIMER: Right.

MS. SARAH VINE: -- calculator that plugged into the wall. The world changes very quickly in -- in the asset information, the analytics, and the -- the development capability, so I think pretty much --

MR. THOMAS REIMER: Right. So --

MS. SARAH VINE: -- that's very consistently a low scoring.

MR. THOMAS REIMER: -- I guess the issue that I've got, though, is that yesterday you made a point in your presentation of saying that the -- the two point 0 (2.0) scores or two point one three (2.13) scores were consistent with industry, and then you didn't say that about asset information.

And -- and I'm just wondering, like it seems like a low score for me. I -- I know I'm not -- and -- and you didn't mention it as consistent with

industry yesterday.

You recall that?

MS. SARAH VINE: I -- I recall that, yes.

MR. THOMAS REIMER: And asset -- it appears to me that asset information is -- is one (1) of the foundational blocks of this chart. It informs the life cycle delivery, the asset management decision making, and the risk and review, right?

MS. SARAH VINE: It -- it feeds a lot of the other areas, yes.

MR. THOMAS REIMER: You mentioned yesterday that -- that the COVID pandemic was disruptive to the process. We know that, you know, it -- never mind. I think we dealt with that.

Mr. Pawluk, you made a comment yesterday that part of what you're after is to understand asset needs from the bottom up was your term of phrase.

Do you recall that?

MR. JIM PAWLUK: Yes.

MR. THOMAS REIMER: What does -- what does 'bottom up' mean?

MR. JIM PAWLUK: It's just like Ms. Halayko just mentioned, we're looking at what the

assets needs. So we're defining the needs of the systems and the assets from what the actual assets needs, and we're building up to what we need to do for investments.

When you're looking at different options in your investments, you may look at and combine different asset needs and -- and try to find the best value in that. So we're not just looking at it from a top-down kind of lens.

We're looking at what the actual needs are and building that capability and identifying what that is. And that's what the AM analysis in Appendix 7.5 is starting to do. It -- it's a starting point for us to identify the needs of the assets.

MR. THOMAS REIMER: But I believe Manitoba Hydro has acknowledged that it's not something that it's able to do based on its -- on its present capacities.

MR. JIM PAWLUK: No, I would not agree with that. I mean, we're doing it. Where -- when you look at the scoring of our maturity, it's across the enterprise and it's linking all the different energy streams together.

It's not that we're not doing asset management. We are. We are making good decisions. We

are using the data. We do have data. I think it's been mischaracterized that we have no data and all of our data's bad. That's -- that's not true.

So we are doing asset management and we are making decisions, but what we can do is optimize even further and take it to another level. And that's where we're going on the journey of asset management.

(BRIEF PAUSE)

MR. THOMAS REIMER: Mr. Pawluk, yesterday you talked about needing to -- that to develop capacity, you needed time to build, and I think you were referring mostly to training skilled labour.

Is that right?

MR. JIM PAWLUK: That's one (1) aspect of it, but when we're talking about capacity and we want to increase our capital spend to support our assets, it's -- it's all the professionals as well. It's -- it's our site staff. Like the capacity has to built throughout. It -- it --

MR. THOMAS REIMER: But it's people?

MR. JIM PAWLUK: It could be people. It could be -- technology could give you capacity as

well.

MR. THOMAS REIMER: And I don't know that this was referred to this morning during Mr. Williams's examination, but at -- pardon me -- tab 7, page 36 of 51, at the top of the page, second paragraph, there's a reference to strategic workforce planning initiative.

Do you see that?

MR. JIM PAWLUK: Yeah.

MR. THOMAS REIMER: And was that what the discussion -- Mr. Williams was looking at a different document, but was there an undertaking to provide anything that can be filed with the Board with respect to that initiative? If not, I'd ask for it now.

MR. JIM PAWLUK: I don't think so at this time.

MR. THOMAS REIMER: There's nothing that you can provide?

MR. JIM PAWLUK: Not that I'm aware of.

MR. THOMAS REIMER: Thank you.

MR. JIM PAWLUK: We can look into it, but I'm -- I'm not aware.

THE CHAIRPERSON: Mr. Reimer, you need

to wrap it up.

MR. THOMAS REIMER: Thank you. Yes.

(BRIEF PAUSE)

MR. THOMAS REIMER: Thank you to the panel. Those are my questions.

THE CHAIRPERSON: Thank you, Mr. Reimer. We -- we have some questions from the Panel.

Sorry. Mr. Peters...?

MR. BOB PETERS: Mr. Chair, I just wanted to interject on a process question, and Mr. Reimer prompted -- his second last question prompted that.

I had understood Dr. Williams had asked for an undertaking of this panel that Mr. Czarnecki was going to consider over the morning break.

Unless I was asleep at the switch, I didn't understood whether that has been responded to or -- I just thought I'd follow it up at this time before the Panel's questions.

MR. BRENT CZARNECKI: Thank you, Mr. Peters. Mr. Turner hasn't actually reviewed that document yet, so would like an opportunity -- I'm going to suggest over the lunch time -- to see if he

has any concerns with the filing of it. So I expect a report back after lunch on that.

THE CHAIRPERSON: Okay. We're going to -- here's the concern I have. If -- if he reviews it and you say no, the Panel's going to have to decide whether we direct it or not. If it gets produced, the later it gets produced, the greater the likelihood we may have to call this panel back.

And I would rather try and finish with this panel today so you can all go and do your regular jobs -- although I'm sure you'll all be live streaming the rest of the hearing. But -- so the sooner, the better.

MR. BRENT CZARNECKI: And, Mr. Chairman, we do understand the concern, and I'm hoping that we're leaning towards producing it. But I do want to make Hydro's concern clear as well is that this is a -- I'll say more or less a hot-off-the-press type of document.

The concern works from a fairness perspective on the other end of it, that we produce it and Mr. Williams looks at it and does something within argument that it wasn't properly addressed.

So I will leave it, if we do produce it, in your good hands to weigh those types of

submissions accordingly because it hasn't been properly vetted through the entirety of this process.

THE CHAIRPERSON: Right.

MR. BRENT CZARNECKI: So that -- that's always my concern with new information on undertakings, that it's just a matter of timing that it develops in the midst of a stream of this process.

And I have seen it pop up with quite the -- the amount of force that wants to be attached to these types of things is not then afforded this process that we've been at for several months now.

But I have your point, and again, I'm hoping that we can --

THE CHAIRPERSON: Yeah. Well --

MR. BRENT CZARNECKI: -- produce it after lunch.

THE CHAIRPERSON: -- we'll -- we'll deal with it later. On the other hand, Mr. Czarnecki, the -- the problem is this is sort of a live process. We don't do a cutoff. If we don't see it now, just -- and I'm not making a ruling -- if we don't see it now, we're not seeing it for three (3) years, and then it's -- you know.

You also have re-examination at the end of -- you know, at the end of the hearing if -- if

anything. So we -- we will endeavour to be as fair as possible.

Ms. Bellringer, you had a question.

BOARD MEMBER BELLRINGER: I did. And I'm -- I'm just -- I'm wanting to make sure I understand what reports are available on asset health. And Mr. Fogg did mention the 'D' word, the depreciation, so I appreciate we'll have a chance to circle back to that in a week and a half or so.

It -- the -- there's a depreciation study 2019 referenced in various places.

Is that the most recent report like that? I'll start with that.

MR. ALASTAIR FOGG: Thank you for the question. I believe the 2019 depreciation study was produced by Concentric and is related to ELG depreciation rates.

There was a new study filed as part of this application by Alliance which is related to the ASL depreciation. That -- I can't remember the exact reference, but we could find that for you.

BOARD MEMBER BELLRINGER: Well, I'll -- I'll go back and check, too, because it's the one that I'm thinking references over depreciation. And I thought that was a separate report from both the ESL

and -- and the ASL and the ELG reports, but maybe -- maybe that's where I'm getting confused.

And there's reference to an asset condition assessment. Is that different? Is there -- is there another -- is there an actual formal report on asset condition assessment apart from any of the depreciation reports?

MR. JIM PAWLUK: Not with this application. There may have one -- been one done on previous applications, but not with this application.

BOARD MEMBER BELLRINGER: Is there -- is there a relevant one that you would actually turn to and say -- you know, in the application or not, but that you say -- that's where I'm -- that's why I'm say -- I'm just trying to get a better handle on detailed documents that support the health.

I appreciate the process. And you've gone through a lot of information around that, so it's not about better understanding what other processes you follow, it's just actual reports.

So, I'm, at the -- at the moment, understanding that there are two (2) relevant documents, the ELG, and then the ASL, two (2) depreciation reports, and that's it? Maybe we can just circle --

MR. JIM PAWLUK: I think --

BOARD MEMBER BELLRINGER: You can circle back at some other time.

MR. JIM PAWLUK: The best place we could point you to get an understanding of the needs of the assets -- I think that's really what you're trying to assess, what -- what are the needs of the assets, what do we need to be doing to make sure our assets are in good operating condition?

BOARD MEMBER BELLRINGER: Well, okay, so I'm jumping ahead to a depreciation conversation in my head, which would be, if you -- if you took all your assets that you have today, what are they worth? I mean, that's where I'm going.

And having said that, it links directly to you take all your assets today, and you manage your assets and you assess their health and, therefore, it tells you what they're worth today.

So, there's the accounting stream we're going to walk down. And then there's the now connect that to the actual asset management process.

So, I'm -- I'm -- it's -- it's a little early to have the full conversation. I appreciate that. I'm not trying to go there. I'm just trying to make sure I've got all of the information that I need

to review and -- and assess to -- to make sure the value conversation and the health conversation are properly connected.

MR. ALASTAIR FOGG: We could certainly look into that further and consider what -- what the depreciation reports may say from this is the anticipated depreciation versus actual retirements that we're seeing or the time frame where those assets are retired verus what was anticipated.

And that could be a discussion we have further as part of depreciation or -- or at another point in time, but we'll look for those specific reports or findings that may help inform that for you.

THE CHAIRPERSON: Thank you. Mr. Sy...?

BOARD MEMBER SY: I promise it's not going to be a price elasticity question. Yeah, I -- I'm trying to get some understanding on the question that Mr. Reimer has brought regarding the BOC $200 million increase.

I'm like him, I'm new. I -- I apologize, obviously, for all those questions that I ask -- that I'm asking that may not be appropriate. But I'm just trying to get a -- have an understanding of how good Manitoba Hydro is when it comes to

forecasting.

I mean, you know, we talk about plan 2040. We talk about ten (10) year plan, twenty (20) year plan, and -- and a lot of numbers being thrown out. For the twenty (20) year, we probably will not be around or maybe won't remember what happened.

So -- so, how good is Manitoba Hydro when it comes to forecasting? That's -- that's a question I've been asking myself ever since I started, you know, this process.

So, if I -- Exhibit CC-14 -- I sound like a lawyer now. The Keeyask project, the estimated cost was 6.5 billion. That was in 2014. 2022, total cost was 8.7 billion, a delta of 2.3 billion, or 34 percent. So, this is, like, in an eight (8) year span, there has been, like, a 34 percent variance, or delta.

If I go ahead and make a linear projection, which obviously is not the right thing to do, but just to say, in eight (8) years, the delta is about 4 percent.

So, how good then is all this ten (10) year, twenty (20) year projections if you look at the record and say, based on this, it's almost like there is a 4 percent chance -- a 4 percent chance of being

off every year.

Going back then to the BOC 200 million, like what Mr. Reimer was trying to get, how good are we, because are we going to be projecting to be 10 percent off, 20 percent off, 30 percent off? Like, how -- what is the risk that you're going to come in with a number that is higher than $200 million? Thank you.

(BRIEF PAUSE)

MR. HAL TURNER: Thank you for the question. Just so -- I don't think we should confuse our capital budgeting processes and where our projects end up with a portfolio projection, so -- they're different -- different animals.

The short answer is, we -- we can't give you that number. We don't know. I would say the -- the $200 million increase in sustainment spend is our -- is based on the best information we have today as it's -- I would -- I would say to you -- to you we're very confident that we need to be spending more and that it's going to be reasonably close to the 200 million.

As we mature our asset management

system, as we get better data and better systems, we'll be able to refine that number. You know, we've -- we've suggested we're going to ramp up over time.

So, I would suggest that, as -- there's little risk at this point in time because by the -- you know, in -- in three (3) to five (5) years we're going to be more mature. We'll be able to give you a more refined number.

And I suspect there'll be plenty of time -- if that number of overstating the need, I think there'll be plenty of time to adjust our spending. It may be that it's understating the need, and we may have to increase the spending.

So, unfortunately, I can't give you an answer to that because we don't know. But I can tell you that over time, we'll -- we'll get -- we'll start to gain a better understanding of how accurate that number is, and I think there'll be time to adjust.

(BRIEF PAUSE)

THE CHAIRPERSON: Thank you. We'll -- we'll take the lunchbreak and reconvene at one o'clock. Thank you.

--- Upon recessing at 11:58 a.m.
--- Upon resuming at 1:02 p.m.

THE CHAIRPERSON: Okay. If we could start. I guess before we start with M. Hacault, Mr. Czarnecki, do we have a decision on -- on that study?

MR. JIM PAWLUK: Just -- so two (2) things. Yes, we'll provide the study. We'll get that to you this week.

And then I wanted to -- sorry -- I wanted to just clarify. Mr. Williams asked about Keeyask, asked if it was 695 megawatts, and I just want to add a little bit more context.

So the nameplate of Keeyask is 695 megawatts. The net capacity increase on the system is actually 630 megawatts, and so the tail race or the downstream water level of Keeyask is influenced by the forebay, the upstream water level of Kettle. And so those two (2) things interact.

So he's -- six ninety-five (695) was correct, but the actual impact is six thirty (630).

THE CHAIRPERSON: Okay. Thank you.

MR. BRENT CZARNECKI: Thank you.

THE CHAIRPERSON: Thank you.

Mr. Hacault...?

MR. ANTOINE HACAULT: Thank you, Mr. Chair, members of the Panel.

CROSS-EXAMINATION BY MR. ANTOINE HACAULT:

MR. ANTOINE HACAULT: For the benefit of this panel, my name is Antoine Hacault of KDS Law. We represent large industrial users, and I intend to ask questions related to asset management in the following four (4) areas.

Firstly, understanding how reliability fits into transmission, sub-transmission, and distribution.

Secondly, tracking reliability and what can be improved to track liability (sic) and corresponding asset management. It's kind of a distinct area.

Thirdly, understanding the tracking of costs of outages and what can be done to improve the tracking of costs of outages.

And lastly, understanding what inputs go into Copperleaf with respect to the cost of outages and how cost of outages gets weighed in the asset management system.

So with that general introduction, I'm starting the first subject area, understanding how

reliability fits into the different components of our hydro system, firstly, transmission.

At that level -- and I'm not directing to anybody in particular -- am I correct that General Service Large, over 100 kV, would be served directly from transmission?

MR. JIM PAWLUK: That's correct.

MR. ANTOINE HACAULT: And you may or may not be able to confirm this, but Chemtrade, Koch, Gerdau, Rokett, Enbridge, Amsted and CKP are served directly on transmission at greater than 100 kV. That makes sense?

MS. TANIS BRAKO: That's correct.

MR. ANTOINE HACAULT: Okay. And on slide 30 of the initial presentation -- you don't -- we don't need to go there, but there had been an indication that there were four (4) representatives dealing with ten (10) companies, and those companies would be included in who would be served by those four (4) representatives?

MS. TANIS BRAKO: That's correct.

MR. ANTOINE HACAULT: Okay. On this panel -- and, sorry, I don't mean to be insulting by saying this -- is there any corporate history knowledge as to the historical number of key account

representatives previously being greater for that category?

MS. TANIS BRAKO: Ms. Brako speaking. I should clarify that first. I'd have to undertake to check specific to key account officers. However, we have just undertaken a review in the last short while here to understand our broader team relative to our account management team and what the current numbers are compared to pre-VDP levels. But I can't comment specifically to those.

I'll suggest to you, subject to check, that the number was greater. You had five (5) account representatives for those ten (10) key clients in the past, if that information --

MS. TANIS BRAKO: Actually, that -- that sounds accurate --

MR. ANTOINE HACAULT: Okay.

MS. TANIS BRAKO: -- correct.

MR. ANTOINE HACAULT: Thank you. There's a lot of analysis that's been put on the record with respect to general staff cutbacks, and both firstly with the voluntary departure requirements and then the 10 percent I think related to COVID.

I wasn't able to find anywhere in the system or the information numbers that corresponded

with the new information that was put in the slides. That was at slide 30 on the amount of key account representatives and twelve (12) major account representatives because it shows the evolution in other slides in a very general way.

Did I miss something, or is there something that helps me understand the cutbacks that were -- if any, that were -- had to be made with respect to the positions indicated on slide 30 on the right-hand side for key account representatives, twelve (12) major account representatives?

Is there anything that would inform me on what type of cutbacks those clients had to deal with?

MS. TANIS BRAKO: No, there wasn't anything submitted specific to that in this Application. We did speak rather broadly to the 15 percent reduction as a result of VDP, and then as you mentioned cost reductions.

But we didn't provide details of exactly where those positions were impacted throughout the Company, but I can share that we have done a recent evaluation, and we know that we're at about ten (10) FTE'ish less in this team as a result -- like as a difference to VDP numbers.

MR. ANTOINE HACAULT: Okay. That's useful information. Thank you. I just wanted to have a sense of the level of service because you can't ask the same number of staff to do exactly what the other complement of staff with ten (10) additional EFTs would have been able to do.

Now, this is a general question. I'll suggest that ensuring the robustness of transmission benefits all Manitoba customers, correct? It's not limited to the industrials who hook up directly to transmission.

MR. JIM PAWLUK: That's correct.

MR. ANTOINE HACAULT: And same question on generation assets. Ensuring the robustness of generation assets benefits all Manitoba customers, correct?

MR. JIM PAWLUK: Correct.

MR. ANTOINE HACAULT: Now, I'm getting into a little bit of -- I don't know if I'll call it technical, but I want to have a sense as to whether we're ad idem as to what constitutes transmission on your system.

So I've started with customers being served at greater levels than 100 kV, but your system actually has different components over a hundred kV,

correct, different levels of service?

MR. JIM PAWLUK: Sorry, are you -- are you asking are there different levels of voltage above a hundred kV?

MR. ANTOINE HACAULT: Voltage.

MR. JIM PAWLUK: Yes, that's correct.

MR. ANTOINE HACAULT: For example, you have 500 kVA --

MR. JIM PAWLUK: Yeah.

MR. ANTOINE HACAULT: -- 230 kVA, 138 kVA, and, finally, 115 kVA. Those are all over a hundred?

MR. JIM PAWLUK: Correct.

MR. ANTOINE HACAULT: And those would all be categorized in what I would call transmission.

Am I right there?

(BRIEF PAUSE)

MR. JIM PAWLUK: So, all voltages above 66 kV would be considered transmission.

MR. ANTOINE HACAULT: Okay. Above --

MR. JIM PAWLUK: Above 66.

MR. ANTOINE HACAULT: Okay. That's consistent. Okay. And here, if we can go -- we've

reproduced in a book of documents -- sorry if -- we've only just recently got it, but it's a reproduction of tab 7 of the materials of Hydro in this application. That's at...

And in this figure, right below the figure, there's reference to, we see there, transmission system average interruption duration index, it's called T-SAIDI, and then transmission system average interruption frequency index, T-SAIFI.

Can I assume that those metrics relate to the transmission as we just defined them, or is it a different metric that we're measuring?

(BRIEF PAUSE)

MR. JIM PAWLUK: So, there's a little debate happening behind us of whether 66 kV is -- are in these numbers or not, so would it be okay if we provide that clarity a little bit later?

MR. ANTOINE HACAULT: Yes. I'm just trying to get some common understanding when we're discussing these different statistics, and looking on -- on the slides, which part of your system, because I started my presentation by saying I was going to try and break it down to transmission, sub-transmission,

and distribution.

And I wanted to have a sense of what those statistics particularly talked about, whether it was generation and the transmission leading up to anything over 66. So, if you can take that and get back to us, that would be great.

So, now I'm going to speak to the next step down in voltage. You've mentioned 66 kV and 33 kV transmission lines. And in that, would I be correct to include corresponding low voltage portions of substations? That would be considered sub-transmission together?

(BRIEF PAUSE)

MR. JIM PAWLUK: I believe that's correct.

MR. ANTOINE HACAULT: Okay. Thank you. Now, Ms. Brako, maybe you'll answer this.

My information is MIPUG companies like ERCO Worldwide, TC Energy that we had some discussions about, Enbridge and Simplot are served at a sub-transmission level.

You can take it subject to check if you're not absolutely sure.

MS. TANIS BRAKO: Subject to check. Thank you.

MR. ANTOINE HACAULT: Now -- and you're going to get clarification on this. My next question was: Is the sub-transmission level performance included in distribution SAIFI or SAIDI, or is it at the transmission level or both? Are you able that answer that, when we look at all these charts?

I'm just trying to see what the stats refer to specifically.

(BRIEF PAUSE)

MR. JIM PAWLUK: We will get that answer for you. We just don't have it right at this moment.

MR. ANTOINE HACAULT: Okay. I think I can continue my questioning as just -- you can see what I'm trying to get a sense of because we've been discussing about these safety figures. But what do they relate to, the transmission portion, sub-transmission portion, or the distribution portion?

I'm trying to get a better sense of that, so that would be appreciated. I'll say

undertaking just so we can pick that up.

--- UNDERTAKING NO. 17: Manitoba Hydro to advise if the sub-transmission level performance included in distribution SAIFI or SAIDI, or is it at the transmission level or both

CONTINUED BY MR. ANTOINE HACAULT:

MR. ANTOINE HACAULT: I've got another extract that I'll refer to out of your chapter number 7 in this filing, and it's at page 50 of the PDF, so the next page, Ms. Schubert.

Going down a bit lower there's some highlighting. And this may help answer some of the questions that I've been asking, but I'll give you time to read the highlighting at the bottom of page 11 of 51 and at the top of page 12.

(BRIEF PAUSE)

MR. ANTOINE HACAULT: So, I want to have a little bit better understanding with respect to the portion of this evidence that indicates:

"Extensive use of radial 66 kV transmission lines to economically serve Manitoba's extensive geographic distribution of small communities."

First, I want to focus on radial. What's the importance of radial? Does that tell us if there's noted the starting point of that line, that it can affect all the branches and communities or...?

MR. HAL TURNER: Everything. So, there's -- radially would -- would imply there's one (1) feed, one (1) -- only one (1) way to serve that group of communities.

And so, if you had an interruption somewhere along that line, everything downstream of that line, so everything on the opposite side of the outage from where the generation sources are, would experience an outage, whereas in say urban areas like Winnipeg, you may -- you've got -- I can't -- I apologize. I don't remember the correct term for opposite of radial feed, but you'll have multiple feeds.

So, you can have an outage on a line, but customers may not experience an interruption.

MR. ANTOINE HACAULT: Because there's

a web of different lines throughout the -- that service area, so that, if you have -- one (1) line gets interrupted, the power finds its way through the other lines, ultimately getting --

MR. HAL TURNER: Correct. Yeah. Or you may have -- at a distribution station level you may have multiple feeds into that system, so you can course the energy from to multiple lines, correct.

MR. ANTOINE HACAULT: So, that is something that might affect how -- the types of questions we were discussing this morning. Does a failure of an asset affect the service to a home or a business?

If it's a radial and we get the failure of that transmission asset, there's no other way for the power to get to the community, correct --

MR. HAL TURNER: Correct.

MR. ANTOINE HACAULT: -- versus, if you have a failure of an asset in -- in the city of Winnipeg that transmits power, that doesn't necessarily mean that you will not have service provided?

MR. HAL TURNER: Correct. There typically will be some redundant feeds that will -- will be able to allow us to continue to serve those

customers.

MR. ANTOINE HACAULT: Okay. Thank you. That's helpful for me to understand.

The next reduction in level as I under -- oh, sorry.

(BRIEF PAUSE)

MR. HAL TURNER: Can I give you answers to the questions about the T-SAIDI AND T-SAIFI and --

MR. ANTOINE HACAULT: Absolutely. If you're able to clarify that now, that would be fantastic.

MR. HAL TURNER: Great. Mr. Turner talking. So, T-SAIDI and T-SAIFI include 66 KV and above.

MR. ANTOINE HACAULT: Thank you.

MR. HAL TURNER: Everything below 66 KV is in SAIDI and SAIFI.

MR. ANTOINE HACAULT: Okay. So, that would -- am I correct that that includes the thirty-three (33) kV lines then in SAIDI? But the thirty-three (33) kV's are excluded from the T?

MR. HAL TURNER: Correct.

(BRIEF PAUSE)

MR. HAL TURNER: We're just going to double-check where the thirty-three (33) kV is. There's a lot -- again, there's a little bit of confusion in the background here, so we're going to confirm where the thirty-three (33) kV is. For sure sixty-six (66) and above is in T-SAIDI, T-SAIFI.

MR. ANTOINE HACAULT: Okay.

MR. HAL TURNER: There's some differing opinions on where thirty-three (33) shows up and we'll -- we'll get that sorted out shortly.

MR. ANTOINE HACAULT: But -- but thank you, that's useful information because I -- I wasn't too sure when we looked at the comments in the highlighting.

When we had failures on the sixty-six (66) kV line, either in frequency or in duration, whether that was captured by the T-SAIDI and SAIFI metrics, because we're including a different type of risk, I'm going to say, related to those lines compared to other lines. So, thank you.

I was about to go down to the -- what I believe -- understand to be the next step down in -- in voltage. That would be at thirty (30) kV or less,

with corresponding low voltage portions of substations.

Would those assets be considered distribution assets? Or distribution level customers?

MR. HAL TURNER: That's correct.

MR. ANTOINE HACAULT: Okay. So, also included in, in that -- those distribution assets is things that I see in my country home with the transformers can blow up and it serves us down to the either 100 -- 110 volts, which is our regular plugs. Correct?

MR. HAL TURNER: I'm not sure which country your home is in, but if it's Manitoba, correct.

MR. ANTOINE HACAULT: And -- yeah, okay. Good -- good stab there.

And some outlets for guys like me who actually have a welder are two-forty (240), right?

MR. HAL TURNER: That's correct.

MR. ANTOINE HACAULT: Yeah, the hot water and clothes dryers can also be at the two-forty (240) volts. Correct?

MR. HAL TURNER: Correct. Your stove as well.

MR. ANTOINE HACAULT: Yeah. So,

again, I don't know if we can answer this subject to check, but examples of MIPUG Industrials served at the less than thirty (30) kV, include Mapleleaf with three (3) sites, Winpac with one service and HyLife with one service. Are you able to confirm that or not?

MS. TANIS BRAKO: Yes. Correct.

MR. ANTOINE HACAULT: Now, Mapleleaf is a bit unique, is it not? We heard Mapleleaf in its presentation indicate that it has a dedicated service to it which is a little bit different than other customers served at that level. Is that correct?

MS. TANIS BRAKO: Correct.

MR. ANTOINE HACAULT: Okay. Thank you. This leads me to the second subject area, understanding the tracking and reliability and what can be done to improve tracking of reliability and corresponding asset management.

Can I have an explanation as to what Manitoba Hydro does to track outages for customers served at a transmission level? I want to deal with that level first.

Is it reliant on the client communicating the outage, say a two (2) or three (3) second outage to Manitoba Hydro and its service representatives? Or does it have measuring equipment

which can actually identify and track those outages?

MR. CYRIL PATTERSON: Yeah, it's Cyril Patterson speaking. So, many of our transmission lines do have network visibility and monitoring on the systems at our breakers.

So, we can actually -- we understand and can know the status or a status change of our transmission lines. Not all though, so it is -- it is not across the entire group of transmission lines in the system. So, not all of them have that level of technology on them that we can understand the -- the status.

MR. ANTOINE HACAULT: Okay. So, for the -- what I called transmission lines customers, like ChemTrade, I'll -- I'll just use that specific example.

Is that -- if there's a power outage, does ChemTrade have to notify Manitoba Hydro or does Manitoba Hydro know about, as such, one of your biggest users, know about that outage before the client calls?

MR. CYRIL PATTERSON: Yeah, I don't specifically know about ChemTrade. We could take that as an Undertaking and verify, but there is -- like, there's one (1) of two (2).

They either -- we know immediately when the breaker trips feeding ChemTrade and that there's been an operation on that line, or the customer has to notify us that they're experiencing an outage.

MR. ANTOINE HACAULT: Yeah. And the only piece of equipment -- so, you've identified these breakers, they trip, you know and you're notified.

MR. CYRIL PATTERSON: Correct. Yeah, there's system control operators that are monitoring the system 24/7, 365 days a year and they get alarms on the SCADA (phonetic) system that notifies them when a breaker or a line, like in a transmission system, changes status, trips due to fault, conditions or fails.

MR. ANTOINE HACAULT: Yeah. And, for Hydro to be able to identify this condition, in all of its transmission lines, would it be a major investment?

MR. CYRIL PATTERSON: Yes, it would be.

MR. ANTOINE HACAULT: Okay. Now when something along that trips, do the service representatives communicate at a tran -- still at a transmission level here, where people are connected directly to those large lines, does -- do they

communicate or how does -- how does the communication occur between the clients and -- and Hydro?

(BRIEF PAUSE)

MS. TANIS BRAKO: Ms. Brako, speaking here. So, when there's an outage on a transmission line, just like Cyril was mentioning, you know, depending on the visibility that we have on that transmission system, there will be notification sent to the key account officers that represent those customers and then communications will follow.

However, what typically happens is any type of an outage like that will directly affect our customer, and they're going to know very quickly that their system is impacted, so they will contact our key account officer right away to let them know they have an outage and that representative will then start communicating with operations folks to understand what the cause of the outage was and duration that, you know, we anticipate that they'll be out for.

MR. ANTOINE HACAULT: Okay. Thank you for that. Now, as far as duration, is that a little bit like my home, when a breaker goes, I know immediately it doesn't have to be out for five (5)

minutes, or is there some kind of a time frame that needs to occur before your operators are notified that there is an outage at a transmission level?

I'll kind of further given an example of what I'm trying to understand, is, if there's a one (1) second outage, does that prompt an alarm to your -- to your people?

MR. CYRIL PATTERSON: Again, that would -- it's Mr. Patterson speaking -- that would depend on the level of technology that we have on that transmission line.

So, intermittent outages, such as you're mentioning, the one (1) second or less outages that are almost a flickering of the power or a -- a -- an intermittent loss of power that restores itself, we can detect them both through the monitoring of the breaker system, through our technology at the stations or customers report it to us through a complaint.

MR. ANTOINE HACAULT: Okay. And there's another document that was PUB-MFR-107. I have it at page 130 of the pdf document here. It refers to -- can you just go down to the bottom. I just want to make sure we're on the right page -- I have -- yes, it's page 95.

That's a Manitoba Hydro document and it

talks about various metrics and things and it talks about automated digital fault detectors. It talks about it being new equipment.

Can you somebody explain to me what the difference is between that and what you've just been talking about, Mr. Patterson?

(BRIEF PAUSE)

MR. CYRIL PATTERSON: I apologize. I was getting a clarification on the T-SAIDI AND SAIFI. Could you repeat the question?

MR. ANTOINE HACAULT: There's reference to installing automated digital fault detectors and it being new equipment, which would save hours of crew time by reporting the exact location of faults that would otherwise have to be determined manually by Manitoba Hydro.

Can you explain the difference between that technology and -- and the breaker?

MR. CYRIL PATTERSON: Yeah. So, breakers, themselves, historically, do not have this level of technology on -- installed on them to be able to detect fault location. Some of the newer breakers do, which is what they're referring to, where, through

the measuring of the fault size in amps, they can actually determine the distance from the source that the fault occurred.

So, they can actually determine which span of conductor from the source station the fault occurred in, whether a tree contacted the line or a lightning strike occurred. That greatly reduces the response time by directing the people doing the trouble-shooting, the technicians that go to restore the power, directly to the fault location to do the repairs or verify that the power line is still intact.

So, previously to not having fault indication information like this, they would have to drive the entire length of the line looking for damages or looking for an indication of a fault.

MR. ANTOINE HACAULT: And can you, without getting into too much detail, does this apply -- this technology apply to transmission, sub-transmission, and distribution or just to distribution? Which level?

MR. CYRIL PATTERSON: No. This technology's available at all voltage levels.

MR. ANTOINE HACAULT: Okay. And are you able to give a general sense of the progress of installing this type of technology in your system?

MR. CYRIL PATTERSON: We've been making great strides in installing fault -- we've been using fault indicators of various levels of technology for many years, literally blinking lights on the power lines, when a fault occurs, that trouble-shooters could go out and look at visually, to ones that are connected to the grid, itself, and can actually communicate with a centralized location.

So, I don't have a percentage of how much fault indication we have on any of the distribution, transmission, or sub-transmission systems today, but we have been working towards improving our fault indication systems, in an effort to do a better job of restoring power.

MR. ANTOINE HACAULT: Thank you for that, Mr. Patterson. Now, I'll switch to the sub-transmission level.

What does Manitoba Hydro do to track outages for MIPUG customers served at a sub-transmission level?

MR. CYRIL PATTERSON: So, yeah, we track every outage to every customer through our -- a system interruption reporting system. So, the trouble-shooters, the technicians that restore power, they ha -- when they're dispatched, they've given a

job related to that outage, whether it's a - a MIPUG member customer or a -- a residential customer, and they have to actually document the -- the time, the duration, the start and end of the duration of that power outage, the cause of the outage, if it can be determined, and, then, the resources required to restore the power outage, material, labour, and they actually enter that outage into the system interruption reporting system and, then, it's tracked, cumulatively, on -- by a customer.

We can report it on -- on it by customer. We can report on it by the feeder, itself, or by the sub-station, if it's at that high level, depending on the size of the power outage, so.

MR. ANTOINE HACAULT: Now, this -- I don't know if I misunderstood, and I don't have the specific reference to the evidence, but I had understood that the SAIDI and SAIFI data is limited to longer outage, like around five (5) minutes, and things below five (5) minutes are tracked.

Did I get that wrong or?

MR. CYRIL PATTERSON: No. That's correct. If we do not respond to an intermittent power interruption, it's because our system worked as designed and it restored itself through breaker

operations. A tree hits a line. It falls clear. You may see a one-minute outage that the system actually tries to restore itself.

The breakers are designed to do that and, then, the tree falls clear and the power is restored. We will not respond to that outage but we may or may not be able to identify it, depending on the level of technology on that system.

As to whether or not we can see the intermittent outage, you're correct in that, typically, the outages we report on are the ones we respond to, where there's an actual power outage that needs our intervention to be able to restore the power.

MR. ANTOINE HACAULT: So, that leads me to a next kind of question.

What kind of tracking, if any, 'cause we've heard some presentations from our members, that it doesn't take a five (5) minute outage to cause a lot of losses to their operations.

What kind of tracking does Manitoba Hydro have or keep with respect to the shorter outages -- outages that you describe as self-correcting?

MR. CYRIL PATTERSON: Currently, unless there's that technology I spoke to earlier

where we can actually see intermittent power outages on breaker operations, that there's the constant turning on and turning off of the power line for various reasons, we do very little tracking on intermittence.

We -- we deal with them, after the fact, through customer complaints. We'll put -- we'll add technology to the line, temporarily, to monitor its performance, and we'll -- we'll plug in items at the station, actually at the consumer end, to monitor the performance of the power line and, then, once we can evaluate that, then we can try to determine what the cause may be.

MR. ANTOINE HACAULT: Thank you for that. So, with industrials at either transmission or a sub-transmission level, do you have any sense of the extra work there might be to track the types of outages which you don't currently track?

I would imagine you have a customer complaint but is it getting logged anywhere to be able to track it?

MR. CYRIL PATTERSON: Today, we'd have limited ability to track and report on that information but, in the future, that's what our grid modernization program is, to try to give us that

visibility and insight into the customer's experience, in conjunction with also AMI technology, to whether or not -- because that's real time provides immediate data tracking and feedback on the status of a customer as to whether or not they're experiencing a -- a lengthy interruption or an intermittent interruption, less than a minute, like you're referring to, so.

MR. ANTOINE HACAULT: Thank you, Mr. Patterson. Can you remind everybody what AMI is?

MR. CYRIL PATTERSON: Automated Metering Infrastructure.

MR. ANTOINE HACAULT: Okay. Thank you. I'm going to move into a sub-section of gathering information on outages and it would be I would qualify it at surveys.

And there's some questions today as to whether or not it's tracked for non-residential customers and there's an explanation that we're probably going there.

So -- so, it's a question, I believe, to Ms. Vine. Are you able to comment on best practices for customer surveys as it relates to large power users for getting data to use in an -- asset management decisions?

MS. SARAH VINE: By data, do you mean

cost to the customer or --

MR. ANTOINE HACAULT: That's a very wide question, because asset management, we thought, relates to three (3) pillars and you're right that I -- that's part of where my line of questioning was going to go is if we're going to be putting any weight on. I think the acronym is VOLL, Value of Lost Load.

MS. SARAH VINE: M-hm.

MR. ANTOINE HACAULT: Or their best practices to -- for a utility to determine the value of lost load to large customers.

MS. SARAH VINE: People do do that and I've seen it more in the middle east than I have here. However, it does defe -- depend on how you are funded. So, what way -- if -- we need to be careful not to prioritize commercial customers over domestic customers.

MR. ANTOINE HACAULT: Fair enough.

MS. SARAH VINE: So, taking into account a customer's financial loss is -- is a bit of a delicate subject.

MR. ANTOINE HACAULT: Okay.

MS. SARAH VINE: But if they are paying for a level of service, say some of them have service agreements that state the reliability that

they are expecting, then I would expect that to be very clearly monitored and valued.

MR. ANTOINE HACAULT: Okay. We'll get into some more detail about the type of information that's being put into Copperleaf, or at least my understanding.

Going down the road that you were taking me, as to customers generally, are you aware of best practices with respect to the type of survey and extent of survey questions?

And this gets a little bit to Board Member Sy's question the other day, you know, to allow people to make valued decisions on the supply of power and reliability and the cost.

Are there some best practices with respect to surveys that might be conducted and how they're built out?

MS. SARAH VINE: I wouldn't say there were best practices for commercial customers. Now, I've -- I've seen practices, but -- but not enough to be able to kind of pinpoint that -- that that's a good example.

MR. ANTOINE HACAULT: Okay.

MS. SARAH VINE: And that's probably getting outside of my --

MR. ANTOINE HACAULT: Your area of expertise, okay. I've -- I've seen some surveys and I've read about them and how they ought to be structured. Actually, Midgard has attached to -- or referenced in their report an article related to that and part of it's reproduced in the Board Counsels' Book of Documents.

But -- would you be aware of any Canadian jurisdictions that have developed surveys of customers to assist in asset management decisions?

MS. SARAH VINE: To assist in the customer's asset management decisions? Yes, I am aware of a large distribution company that is doing that.

MR. ANTOINE HACAULT: Which -- are you able to identify it on the record, no?

MS. SARAH VINE: I kind of don't feel that I should be.

MR. ANTOINE HACAULT: Okay. Fair enough. Now, as far as the willingness to pay study, in the Board Book of Documents, Volume III, Mr. Peters was using this, but pages 71 to 78 I had.

(BRIEF PAUSE)

MR. ANTOINE HACAULT: 71 to 77. That's after tab 3, yes. After -- on the bottom in Capital Planning, I think it's footnote -- we can see footnote 68 being highlighted. Mr. Peters is making my work easy for me here.

And it references a document, a PDF, page 93 of 246 and then the Board Book of Documents starts reproducing that document in the following pages. It's called a literature summary.

And if we go to the next page it -- it says:

> "The questioner development was grounded in and informed by academic literature and the article below was an academic literature review of recent developments in measuring stated preference. It identifies key elements that are necessary --"

At least in that officer's view:

> "-- to include in a willingness to pay study."

And then in the following pages of this book that was distributed to everybody, there's a scenario development and it indicates various things that ought to be addressed.

If you haven't seen this, I'm not going to ask you further questions if you're -- don't think you can comment on whether or not this might be a best practice or not. You haven't?

MS. SARAH VINE: I have no opinion on this.

MR. ANTOINE HACAULT: Then I'll ask Manitoba Hydro then, in reading the application and seeing the Book of Documents prepared by Board counsel, does Manitoba Hydro have any thoughts on whether it would collect this kind of data in order to assist in asset management?

MS. TANIS BRAKO: Ms. Brako, speaking here. So, we -- we did have a look at this submission by Innovative that was submitted my -- by Midgard. You know, we -- we do see the value in having, you know, research relative to what Midgard has put forward here as a potential option.

We'd want to take some time, obviously, to take a look at the methodology to see if it would be relevant. But I'd say it would be more broad, not necessarily related specifically to asset management investments.

It would also be to other investments required for customer service, environmental, et

cetera. And this is something that -- that we would use across our customer base. You know, commercial and industrial sample sizes are small, so that's the other caution as well that we would have in approaching a study like this, but certainly see the value in -- in considering something like this in the future.

MR. ANTOINE HACAULT: Thank you. And following these two (2) pages -- and Ms. Schubert, can you go down to the next page on this listing.

Have you had a chance to check the following pages that are immediately after the couple pages reproduced and Board's counsels Book of Documents? There's actually an actual survey suggested that corresponds to all these various points.

Have you had a chance to look at that or consider that?

MS. TANIS BRAKO: Ms. Brako, speaking again. So, similar to my previous answer, we have reviewed this -- you know, the suggested approach, but we'd certainly need to take more time to reflect on whether or not the methodology would be appropriate.

But certainly, something like this would be, you know, helpful in understanding what that

value would be relative to investment.

MR. ANTOINE HACAULT: Okay. Thank you. I'm going to move to value of lost load now and a couple questions on that.

Now, as a result of participating in asset management generally, does anybody on the panel have an understanding as to whether or not other utilities in Canada conduct value of lost load studies?

(BRIEF PAUSE)

MR. HAL TURNER: Sorry, we don't have that knowledge

MR. ANTOINE HACAULT: Okay. You may want -- wish to check PUB in Newfoundland, Exhibit 89, Christian and Associates (sic) Energy Consulting. There's a report on value of lost load.

Are any surveys -- and I'll deal with it specifically related to MIPUG members. Are there before-outages surveys for the large industrials?

MS. TANIS BRAKO: Sorry, can you repeat that?

MR. ANTOINE HACAULT: Are there before-outage surveys for industrials with respect to

value of lost load?

(BRIEF PAUSE)

MS. TANIS BRAKO: No, we do not.

MR. ANTOINE HACAULT: Okay. And with --

MR. JIM PAWLUK: I just want to --

MR. ANTOINE HACAULT: Yes.

MR. JIM PAWLUK: -- Mr. Pawluk speaking -- just add like when we do look at our investments in our systems, we do consider customer impacts like for duration, frequency of outages. Like that is considered, you know.

So, just letting you know that we -- we do look at that, and we are looking at more of the customer experience as we do future valuations as well.

MR. ANTOINE HACAULT: Anticipated my next questions. I'm actually referring to some of your data on that. Thank you, sir.

Now, am I correct that there is also no after-outage survey on the value of lost load? So that when a customer reports, for example, hey, the power's been out for two (2) minutes, it's had an

impact on my processes here, do you conduct an outage survey after on major industrials?

(BRIEF PAUSE)

MS. TANIS BRAKO: No, we do not conduct that.

MR. ANTOINE HACAULT: Okay. So you don't gather information then on production and revenue impacts, lost wages, additional wages such as overtime, damaged production equipment, impacts of short- and longer-term duration outages, and those types of value of lost load data?

MS. TANIS BRAKO: Ms. Brako speaking here. So not on a formal basis I wouldn't say. With our large industrials, our key account officers will have a discussion, especially if it's, you know, an outage -- outage that has a very large impact.

Just recently experienced one with one (1) of our customers and did collect all of that information to help our internal teams better understand what investments need to be made to mitigate those types of situations happening in the future.

So absolutely it's -- it's happening

when, you know, there are sort of extreme circumstances, I would say, but not on a transactional basis every time an outage occurs.

MR. ANTOINE HACAULT: Thank you.

MR. CYRIL PATTERSON: If I -- if I could just add -- sorry, it's Mr. Patterson speaking.

All of those factors you just mentioned are -- are for sure in the consideration and the decision making when restoring power to those types of customers, reconfiguring the network in order to try to restore power before our -- mitigation before remediation, so, trying to look for a way to restore power before actually correcting the damages that maybe caused the outage.

In those radial-feed situations, that is very difficult, but where there's redundancy we for sure take that approach in all of our restoration efforts, looking for the fastest way to restore power.

MR. ANTOINE HACAULT: Yeah. Thank you. I'm going to try and speed it up here. I've got a couple more questions on two (2) issues, and Mr. Pawluk referred to this value of lost load being tracked in Copperleaf software.

If we go to PDF 74 of our book -- hopefully I've got it right -- there should be a

heading, 'Unserved Energy Costs'.

So am I right in understanding that this is an item that's inputted or can be inputted in Copperleaf? It's the description of Copperleaf and the different aspects that it considers. That was my understanding.

Is anybody able to comment on that?

(BRIEF PAUSE)

MR. ANTOINE HACAULT: You can see at the bottom left-hand side copyright 2017, Copperleaf Technologies Inc.

MS. KRISTA HALAYKO: Could you repeat the question and just repeat this reference again, where it came from?

MR. ANTOINE HACAULT: It's -- it's from MFR-107. It's -- it was a document produced by Manitoba Hydro in response to MFR-107. I believe it was in the 2017, if you look at the index, 2017 General Rate Application.

I'm trying to understand how and if unserved energy costs are considered by Copperleaf.

(BRIEF PAUSE)

MR. JIM PAWLUK: That is part of the calculation that is in Copperleaf, so it's -- it's kind of buried into the measures in our analytics when we do it, but it's based off of not actual data from Manitoba, it's more of an industry practice.

MR. ANTOINE HACAULT: Okay. And has that data been updated? Because the reference that's found on this page at the third bullet just before the end is a 2015 American study.

MS. KRISTA HALAYKO: It hasn't been updated in the system, but I should mention that we're doing a -- a refresh of Copperleaf and the assumptions within Copperleaf and the value measures, and that's one (1) of the things we're looking at.

Also, we do include calculations in the distribution reliability benefit for some projects of outage frequency and duration, and -- and that can be also used for our transmission customers that are directly connected.

MR. ANTOINE HACAULT: Subject to check, can -- and I don't need an answer. I've only got two (2) or three (3) minutes here left.

Does Manitoba Hydro continue to use 10 kV per hour system average for input on this unserved energy cost -- ten dollars ($10), sorry, ten dollars

($10) per kilowatt hour. You can confirm it later.

THE CHAIRPERSON: Mr. Hacault, I've got you at eight (8) minutes, so --

MR. ANTOINE HACAULT: Eight (8) minutes?

THE CHAIRPERSON: Yeah.

MR. ANTOINE HACAULT: Okay, 'cause we started a bit late. Okay.

MS. KRISTA HALAYKO: I'll check on that and get back to you.

CONTINUED BY MR. ANTOINE HACAULT:

MR. ANTOINE HACAULT: Okay. And at the same time, could you check to see whether or not Copperleaf is able to break it down into the types of headings we see on the page in front of us?

Because they're defining unserved energy based on industry studies, and then there's a definition of various types of users. So I'm not too sure whether or not your system allows to calculate the impact of value of lost load based on certain types of industries.

And I'll just take you to a slide just to help understand what the significance of that might be. At pages 135 and 136 of our PDF, that's the study

that's referenced in that footnote. If we go to the bottom, you'll see there's a graph, and it talks about estimated interruption costs for medium and large commercial and industrial. You see that at the top.

So there's some modelling there, and then if we go on to the next page in the PDF, further actually, we'll go down two (2) pages -- it's more illustrative -- there's actually a breakdown in this study between manufacturing and non-manufacturing showing the costs for manufacturers being significantly higher for the value of lost load.

So I'm trying to understand, sometimes we have these computers and softwares that do all -- all sorts of fancy things.

I'm wondering how granular these are in -- in deciding the investments that need to be made?

So, if you're able to answer the question, the ten dollars ($10) per kilowatt, and if it goes in greater granularity, what numbers are used for that greater granularity.

Can I have that as an undertaking, please?

MR. JIM PAWLUK: Yes.

--- UNDERTAKING NO. 18: Manitoba Hydro to answer

the question: the ten dollars ($10) per kilowatt, and if it goes in greater granularity, what numbers are used for that greater granularity.

MS. KRISTA HALAYKO: One (1) thing that I can confirm, and we will check on the ten dollars ($10) per kilowatt hour, is that we have updated those numbers since this document, but I just have to check to see what we updated them to.

CONTINUED BY MR. ANTOINE HACAULT:

MR. ANTOINE HACAULT: Okay. Thank you. That would be appreciated.

At page 156 of our PDF, I think this provides some information. At least we saw this in the 2017/'18 -- I don't know if we can flip that page, Ms. Schubert. It'd be easier to read.

There's a couple things that -- this was a slide that was produced in that application is my understanding. It's a Boston consulting group slide done with respect to the analysis of Bipoles I or II or Dorsey going out of commission.

There's a couple things I'd ask this panel if they can agree. Even if transmission is made more robust according to the centre middle of this slide, where it -- where it says:

"Dorcey, Bipole I and II prolonged inability to serve."

We shed industrial load and priorize (sic) residential heating. That -- that would be how Manitoba Hydro would deal with that kind of catastrophic event?

MR. JIM PAWLUK: I believe that's correct.

MR. ANTOINE HACAULT: Okay. And there is also an evaluation here, and it may have been updated. As you see in the middle of that slide, it says Manitoba Hydro's value of lost load estimate is ten dollars ($10) per kilowatt hour, so that's what you said may be updated.

And at the bottom of that slide there's actually some references to Manitoba Hydro's specific study on this, the footnotes. Are you able to do that?

Now, on the left-hand side again of this slide, with a footnote down to those bottom ones, we see that the value of lost load, at least as

reported on this slide, as being lower for residentials and higher for small commercial industrial and large commercial industrial.

Do you see that? And it's footnoted, so I'm not too sure whether it relates to studies that Manitoba Hydro has done or not because there is one (1) study at the bottom. I'm looking at the bottom of the slide:

> "Manitoba customer interruption cost evaluation for Billington (phonetic), Power Corp. and associates 2001."

Is that still a valid study, do you know? Do you know?

MR. JIM PAWLUK: I don't think we know. And sorry, you were -- you were talking about the MISO value of lost load. And you've asked about the residential value being less than the small industrial, large industrial, sorry? Is that --

MR. ANTOINE HACAULT: Yes. Correct.

MR. JIM PAWLUK: But -- and the reason we would prioritize residential loads over industry is that people need to heat their homes. They need a safe place to be when it's really, really cold, right.

So, it's about -- it's not about the

cost, it's about saving people's lives.

MR. ANTOINE HACAULT: Understood.

MR. JIM PAWLUK: Yeah.

MR. ANTOINE HACAULT: I'm -- I'm not challenging it. I'm just pointing out the fact; that's all.

Now, the last couple questions that I have relates to Copperleaf again. Going back to pages 74 and 75 of the PDF, there's a couple of headings. And we've dealt with heading 5.3.5, unserved energy costs, so I'll go over that.

On the next page, at 5.3.7, there's a heading, "Frequency cost." Does anybody here know what's inputted into Copperleaf with respect to the frequency cost assumptions?

(BRIEF PAUSE)

MR. ANTOINE HACAULT: If you don't, that's okay. Or if there's a simple answer --

MR. HAL TURNER: Yeah.

MR. ANTOINE HACAULT: -- we can undertake.

MR. HAL TURNER: I'll -- I'll take the opportunity to confirm that 33 kV is not in T-SAIDI

and T-SAIFI; it is in SAIDI and SAIFI, so confirming the T-SAIDI and SAIFI is 66 kV and up.

MR. ANTOINE HACAULT: Okay. Thank you. So, I'd asked for the frequency costs and duration costs. What assumptions are used for both items, if I -- if it's not too much work? Presumably, it's a number. If I can have that undertaking.

MR. HAL TURNER: We'll take that as an undertaking.

--- UNDERTAKING NO. 19: Manitoba Hydro to provide what assumptions are used for both items, frequency and duration costs.

CONTINUED BY MR. ANTOINE HACAULT:

MR. ANTOINE HACAULT: Okay. And I think the last question that I would have is: Does Manitoba Hydro input different levels of value of lost load or different levels of voltage service when it comes to making investment decisions? That's the last question.

MS. KRISTA HALAYKO: We do have different values for residential, commercial, and critical service, we break it out in that way, and

mixed.

We do have a table that I believe we can share that isn't entered into evidence now that I could undertake to provide showing exactly how we -- we do that.

MR. ANTOINE HACAULT: And does it -- is that used to make decisions at each level that I've identified?

MS. KRISTA HALAYKO: Yes, for investments that would affect those different levels.

MR. ANTOINE HACAULT: Okay. Thank you.

--- UNDERTAKING NO. 20: Does Manitoba Hydro input different levels of value of lost load or different levels of voltage service when it comes to making investment decisions; if so, advise.

THE CHAIRPERSON: Thank you, Mr. Hacault. Mr. Czarnecki, do you have any re-examination?

(BRIEF PAUSE)

MR. BRENT CZARNECKI: Nothing comes to mind, Mr. Chairman. Thank you.

THE CHAIRPERSON: Thank you. This concludes this Panel. I'd like to thank the panel very much for being here. And we're going to take a break now and sort of reconfigure the room -- or reconfigure our people. And then we will come back in fifteen (15) minutes and start the -- and do -- start the direct examination of Midgard.

Thank you. Thank you to the Panel again.

(PANEL STANDS DOWN)

MR. ANTOINE HACAULT: Oh, I forgot to mark that book as Exhibit 13 for the record.

THE CHAIRPERSON: Okay.

--- EXHIBIT NO. MIPUG-13: MIPUG Book

MR. ANTOINE HACAULT: Thank you.

THE CHAIRPERSON: We'll -- we'll mark it.

--- Upon recessing at 2:08 p.m.
--- Upon resuming at 2:25 p.m.

THE CHAIRPERSON: Mr. Williams...?

DR. BYRON WILLIAMS: Yes. Good afternoon, Mr. Chair and members of the panel.

Before I ask Ms. McMillin to affirm the witnesses, I'll just do introductions and give a very brief outline.

To my immediate left is Mr. Peter Helland. And then, to his left is Chris Oakley.

Our robust back row is Mr. -- my colleague, Mr. Klassen, and our articling student-at-law, Ms. Hannah Taylor (phonetic).

And Mr. Chair and members of the panel, with your permission, by way of outline, we'll, first of all, ask that the witnesses be affirmed.

I'll briefly lead Mr. Helland and Mr. Oakley through a review of their experience as it relates to their evidence. And then, they will take you through their -- their PowerPoint.

And I -- before I forget, certainly, when they go through their PowerPoint, I may interrupt from time to time. And they would welcome introduction -- or introductions -- they welcome

interruptions from -- from the Public Utilities Board. This is the one case where interruptions are okay; rather than for reliability purposes.

So Ms. -- Ms. McMillin, if you'd like to affirm the witnesses?

CONSUMERS COALITION PANEL

PETER HELLAND, Affirmed

CHRISTOPHER OAKLEY, Affirmed

EXAMINATION-IN-CHIEF BY DR. BYRON WILLIAMS:

DR. BYRON WILLIAMS: Thank you, Ms. McMillin. Just for the Board's information, the curriculum vitae of these witnesses are attached to Consumers Coalition Exhibit 1.

But Ms. Schubert, if you could just briefly pull up their -- their evidence. Can -- Exhibit 8 -- page 8.

Mr. Oakley, I'll lead you through this. You have worked in the utility and energy business for thirty-seven (37) years, since receiving your B.Sc. in Electrical Engineering from -- in 1986, sir?

MR. CHRISTOPHER OAKLEY: True.

DR. BYRON WILLIAMS: And you hold a P. Eng. designation?

MR. CHRISTOPHER OAKLEY: I do.

DR. BYRON WILLIAMS: And sir, at one time in your star-crossed career, you moonlighted as a hard rock miner, deep in -- in the bowels of northern Manitoba, is that correct?

MR. CHRISTOPHER OAKLEY: Well, I was actually a full-time employee of HBOG (phonetic), but I -- I did work in hard rock mining, yes.

DR. BYRON WILLIAMS: And in the corporate world, Mr. Oakley, you've held senior roles in project management and -- and operations in generation and transmission, power supply, and transmission system planning. Agreed?

MR. CHRISTOPHER OAKLEY: Yes.

DR. BYRON WILLIAMS: And sir, without going through lengthy detail, among the positions you've held in the corporate world, were Director of Power Supply in Generation for Aquila Networks Canada, A-Q-U-I-L-A, and its predecessors, Utilicore (phonetic) and West Kootenay Power. Agreed?

MR. CHRISTOPHER OAKLEY: Yes.

DR. BYRON WILLIAMS: And sir, you served with -- or you worked with ESBI Alberta in the late 1990s, agreed?

MR. CHRISTOPHER OAKLEY: Yes, the

transmission administrator of Alberta.

DR. BYRON WILLIAMS: And at that point in time, you were responsible for the development and production of a ten (10) year transmission system development plans for the Alberta interconnected electrical system, correct?

MR. CHRISTOPHER OAKLEY: Yes, that's correct.

DR. BYRON WILLIAMS: And you also represented the Western Electric Coordinating Council at the North American Electric Reliability Council, Reliability Assessment Sub-committee, sir?

MR. CHRISTOPHER OAKLEY: That's correct.

DR. BYRON WILLIAMS: Okay. Sir, just turning to your regulatory experience. Your utility regulatory experience includes, but is not limited to, utility capital planning, asset management planning, resource planning, as well as facility siting?

MR. CHRISTOPHER OAKLEY: That's correct.

DR. BYRON WILLIAMS: And you provided expert evidence at the BCUC on a number of occasions on behalf of consumers for issues such as those related to BC Hydro's -- Hydro's revenue requirement,

integrated resource plan, and the Fortis BC long-term electric resource plan. Agreed?

MR. CHRISTOPHER OAKLEY: That's correct.

DR. BYRON WILLIAMS: And at the Ontario Energy Board, sir, you've provided transmission and distribution system development plan, asset management plan, and operational expense review services in more than twenty (20) proceedings.

Agreed?

MR. CHRISTOPHER OAKLEY: Yes.

DR. BYRON WILLIAMS: And of course, you provided the assistance in terms of capital project, asset management, and risk management review to the Manitoba Public Utilities Board during the 2017/18 General Rate Application?

MR. CHRISTOPHER OAKLEY: Yes.

DR. BYRON WILLIAMS: And regulatory support services to another -- a number of other Canadian utilities, such as the Alberta Utilities Commission, Nova Scotia Utility Review Board, and the Newfoundland and Labrador Board of Commissioners of Public Utilities?

MR. CHRISTOPHER OAKLEY: Yes.

DR. BYRON WILLIAMS: And finally, sir

-- almost finally -- you've renewed (sic) numerous projects related to international transmission lines for the Canadian energy regulator, formerly known as the National Energy Board?

MR. CHRISTOPHER OAKLEY: I reviewed them, rather than renewed them. But, correct, yes.

DR. BYRON WILLIAMS: Thank you for that. And one of those projects was the Manitoba Minnesota Transmission Project?

MR. CHRISTOPHER OAKLEY: That's correct.

DR. BYRON WILLIAMS: And sir, finally, at the recent BCUC proceeding related to the BC Hydro '23 to '25 revenue requirement, the panel gave weight to your evidence with respect to utility rate regulation and to engineering matters associated with depreciation?

MR. CHRISTOPHER OAKLEY: Yes.

DR. BYRON WILLIAMS: Okay. Thank you. Mr. Helland, you hold a B.A.Sc. And M.A.Sc., as well as a Masters in Business Admin, and a P. Eng. designation, agreed?

MR. PETER HELLAND: That is correct.

DR. BYRON WILLIAMS: And you obtained, in 2019, a NAMS (phonetic) Canada certificate in asset

management?

MR. PETER HELLAND: Yes.

DR. BYRON WILLIAMS: And prior to Midgard, you worked at Ocean Works International, where you were the senior electrical engineer and, ultimately, project manager that delivered a first in class submarine rescue vehicle to the US Navy for their nuclear submarine fleet. Right?

MR. PETER HELLAND: That is correct.

DR. BYRON WILLIAMS: And that's where you first gained exposure to asset management, process management, risk and review management, asset life cycles, and similar factors, sir?

MR. PETER HELLAND: Yes, that's correct.

DR. BYRON WILLIAMS: And sir, your utility regulation areas of practice include asset management, risk management, resource options planning, and condition assessment, agreed?

MR. PETER HELLAND: Agreed.

DR. BYRON WILLIAMS: And like Mr. Oakley, you provided expert evidence at the BCUC on matters related to BC Hydro and Fortis BC?

MR. PETER HELLAND: Yes.

DR. BYRON WILLIAMS: And that included

the BC Hydro integrated resource plan and Fortis BC long-term electrical resource plan, sir?

MR. PETER HELLAND: That is correct.

DR. BYRON WILLIAMS: And much of your work on -- you have conducted asset management and risk management reviews in over fifteen (15) proceedings related to Canadian distribution and transmission utilities?

MR. PETER HELLAND: Yes.

DR. BYRON WILLIAMS: And much of that work has been related to distribution and transmission system plans for the Ontario Energy Board?

MR. PETER HELLAND: Yes, that is correct.

DR. BYRON WILLIAMS: Like Mr. Oakley, you provided support to the Public Utilities Board at the 2017/18 GRA, sir?

MR. PETER HELLAND: Yes. We worked together on that.

DR. BYRON WILLIAMS: I just want to be clear about your role in that proceeding, sir.

It did not -- did not involve the preparation of material that was filed on the record?

MR. PETER HELLAND: Yeah, that is correct. We were supporting the Board.

DR. BYRON WILLIAMS: Sir, just to finish off, you have supported the Alberta Utilities Commission in reviewing a major transmission project that went considerably over budget and assisted in the provision of an expert report?

MR. PETER HELLAND: Yes.

DR. BYRON WILLIAMS: You were lead author of an expert report commissioned by the Newfoundland and Labrador Public Utilities Board to review and recommend revisions to the capital budget approval guidelines utilized by two (2) major electrical utilities in that province, sir?

MR. PETER HELLAND: Yes.

DR. BYRON WILLIAMS: You provided other support to that -- the Board of Commissioners as well?

MR. PETER HELLAND: Yes.

DR. BYRON WILLIAMS: And you have provided services to multiple government agencies and utilities, including Yukon Energy Corp., Northwest Territories Power Corp., and Bonneville Power Administration, sir?

MR. PETER HELLAND: Yes, that's correct.

DR. BYRON WILLIAMS: And supported

private entities like Boralex Ocean Falls Limited in the development of a strategy for generation, transmission and distribution assets, sir?

MR. PETER HELLAND: Yes.

DR. BYRON WILLIAMS: And, finally Mr. Helland, at the recent BCUC Hearing into the BC Hydro revenue requirement -- revenue requirement for '23/'25, the panel gave weight reviews on general asset management.

MR. PETER HELLAND: Yes, that is correct.

DR. BYRON WILLIAMS: Okay. Mr. Oakley and Mr. Helland, these are just -- Mr. Helland, these are just the housekeeping questions. And I'll ask it of both of you and you can confirm if you agree in sequence, one after the other, not at the same time.

Mr. Oakley and Mr. Helland, Exhibit CC-8, which is your pre-filed written evidence, was prepared under your joint direction and control? And is accurate to the best of your knowledge and belief?

MR. CHRISTOPHER OAKLEY: Yes.

MR. PETER HELLAND: Correct.

DR. BYRON WILLIAMS: And turning to information responses included in Exhibits MH-19, PUB-

14 and MIPUG-8, again, they were prepared under your direction and control and accurate to the best of your knowledge and belief?

MR. CHRISTOPHER OAKLEY: Yes.

MR. PETER HELLAND: Yes.

DR. BYRON WILLIAMS: And, of course, you've prepared jointly a powerpoint, which is before the Board and it -- it -- it was prepared under your joint direction and control and you adopted as forming your evidence?

MR. CHRISTOPHER OAKLEY: Yes.

MR. PETER HELLAND: Yes.

DR. BYRON WILLIAMS: Thank you. Mr. Chair, members of the panel for bearing with me on those important details of -- about our witnesses.

We'd ask that the Powerpoint be marked as CC Consumer Coalition Exhibit 15.

--- EXHIBIT NO. CC-15: Midgard's Presentation

DR. BYRON WILLIAMS: And then I'll invite Mr. Oakley and Mr. Helland to begin their presentation. And I may interrupt from time to time, and again, we would invite the Board too, if you have questions, please.

THE CHAIRPERSON: Thank you.

CONTINUED BY DR. BYRON WILLIAMS:

MR. PETER HELLAND: Okay. Thank you, members of the Board and -- and other participants in this proceeding.

As you know, my name's Peter Helland. Here's a brief Table of Contents about what we'll be covering here today. I'm not going into it in any detail. It hopefully becomes self-evident.

I represent Midgard Consulting here in this proceeding. Mr. Pris -- Mr. Williams, sorry, has taken us through our credentials and I'm not going to spend any more time on that. So, we'll go to the next slide. Next slide please.

So, Manitoba's (sic) Hydro's asset management goal is lowest life-cycle cost. Their -- their stated corporate mission is to ensure reliable energy at the lowest possible cost.

In evidence, Manitoba Hydro has stated that its asset management goal is aligned. It's to optimize the energy system to achieve targeted levels of performance and risk, at the lowest life cycle cost. Next slide please.

But, Manitoba Hydro has also filed that

they have a six (6) decades old capital investment strategy that doesn't necessarily target lowest cost.

So, in response to one of the C -- Consumers Coalition IR's, Manitoba Hydro stated that for more than sixty (60) years, Manitoba Hydro has had a strategy of investing in capital assets that are surplus to Manitoba Hydro's requirements for a considerable period.

And, you know, they provide justifications for that, but it raises the question: Is this investment strategy applicable and still appropriate today? And that's part of the question we'll be discussing.

So, when we look at history versus today, energy consumption growth rates have fallen since Manitoba Hydro's founding. So, in the -- what I'll call the 'early years' or the pre-1985 years, Manitoba Hydro's electricity energy growth, or Manitoba's, to be more precise, not Manitoba Hydro's -- Manitoba's electricity growth, was 7.69 percent over the period from Manitoba Hydro's founding to, basically, 1985.

But, when we look at a more modern period, for the period from 1986 to 2019, the growth rate falls dramatically to 1.33 percent and, in the

most recent fifteen (15) years, or fifteen (15) years of record that -- that we were able to obtain from Statistics Canada, it -- it's fallen to effective -- what is effectively a flat or near 0 (zero) electricity growth rate for Manitoba.

Why does this matter? Well, context is everything and you're going to hear this throughout the presentation, but Manitoba Hydro has claimed that its system performance is degrading. And they provide this graph, and you -- you've seen this graph before. The -- the amber line -- the amber solid line is the -- the frequency of interruptions to service as measured by SAIFI, System Average Interruption Frequency Index. And the solid blue line is the duration.

So, Manitoba Hydro has provided this graph as evidence that system performance is degrading. And -- and the claim made in evidence, is that it's due primarily to asset aging and degraded -- the degrading condition of its assets.

But, we want to dig a little deeper into -- into that claim, and so the story changes when you exclude major events. And, major events are things that are external to Manitoba Hydro's control. They're not asset condition related. So, they're --

they're things that are outside Manitoba Hydro's direct control at this time and they include things like forest fires, ice storms, floods, earthquakes, solar flares -- major events that, to be clear, it's reasonable that Manitoba Hydro doesn't control these things.

So, these -- these major events exist outside Manitoba Hydro's control and that's appropriate.

So, when we look at this same graph and what I'll -- I'll highlight here is the solid amber line is the -- the SAIFI, or the -- the interruption frequency index, and we exclude these major events, what we see is a flat line.

So, compared to this upward trending line that Manitoba Hydro presented originally in its evidence, when you exclude those major events that are outside Manitoba Hydro's control, it now -- the data appears flat.

So, for the things that Manitoba Hydro controls, it's flat. And the same story for SAIDI, which is the blue line -- the blue solid line. Just for the -- the Board's reference, the dotted lines are -- are comparators to other Canadian utilities.

What this leads us to -- to observe is

that overall reliability trends are not deteriorating appreciably, based on asset condition and other factors.

So, there's another piece to this. Utility context is important. We have SAIDI and SAIFI, excluding major events, and when we compare it to other Canadian utilities, that's shown in -- in -- on the blue line, that's dashed, and the amber line that's dashed, what we see is that Manitoba Hydro's performance, as measured by SAIDI and SAIFI, is markedly better than its Canadian peers.

SAIDI is effectively one-third (1/3) of its Canadian peers. So, that means there's one-third (1/3) the duration of outages compared to Manitoba Hydro's Canadian peers.

And when we look at SAIFTY -- SAIFI, pardon me, it's 56 percent of Manitoba Hydro's Canadian peers, approximately 1.8 times better.

Yes...?

VICE-CHAIR KAPITANY: I'm assuming that this is correct, but when you look at those dotted lines that represent other utilities, those also exclude major events?

MR. PETER HELLAND: That is correct.

VICE-CHAIR KAPITANY: Thank you.

MR. PETER HELLAND: So --

BOARD MEMBER SY: Oh, sorry, I --

MR. PETER HELLAND: No.

BOARD MEMBER SY: -- along the same line, I see is more variability on the dotted line on page -- I guess, where you -- when you exclude a major event than when you don't exclude a major event.

MR. PETER HELLAND: Are you -- we talking about for Manitoba Hydro or for Canadian Utilities?

BOARD MEMBER SY: No, for the others.

MR. PETER HELLAND: Okay, so --

BOARD MEMBER SY: I -- I'm just trying to understand why on one side -- yeah, okay, slide number 10 and slide number 11.

MR. PETER HELLAND: Okay. So, let's -- let's just -- so, one of the important things to look there is a sense of scale.

When we look on slide 10, which is showing on the screen right now, for example, SAIDI, it goes from a range -- a -- a high -- SAIDI high, in -- I believe fiscal year '20 of 300 down to what we'll call it -- in the hundred -- hundred and fifty range. So, a sense of scale is im -- we probably should have recast all -- everything on the same scale, so,

there's a visual -- a visual thing there, Board Member Sy.

BOARD MEMBER SY: Yes.

CONTINUED BY DR. BYRON WILLIAMS:

MR. PETER HELLAND: So, next slide please -- does that answer your question, I guess? Okay.

So, we -- we've heard some evidence and -- and I'm sure there will be cross-examination on this topic about the different desires of different ratepayer groups with regards to reliability and how it's measured.

So, SAIDI and SAIFI are -- are standard industry metrics for residential and overall system performance and they, you know, generally, represent what ratepayers desi -- you know, it -- it -- it's an accurate measurement of what ratepayers desire and can be used accordingly.

Industrials, as we have heard in evidence, some of them desire enhanced reliability metrics, in certain cases, that -- that go beyond SAIDI and SAIFI.

An example would be MAIFI, a momentary outage tracking and there -- there -- there's been

evidence about that, or specific power quality.

And, also, in evidence, listening, I guess it was a couple days ago now, it's all blurring together for me, you know, some of the desires for increased reliability are moderated by potential rate impacts that might -- might -- might result from targeted investments that -- that certain groups would be -- would be attributed to -- to certain groups.

So, yep, there's -- there's a conversation there and I'm sure we're going to have lots of conversation about it.

Vice-Chair Kapitany...?

VICE-CHAIR KAPITANY: Thanks. So, I'm assuming, then, that you had listened in to our presentations on May 15, so, you would have heard TC Energy, talking about their -- their desire for reliability, and I don't know if you would have seen their deck -- the slide presentation they made, but --

MR. PETER HELLAND: I -- I was provided with their slide deck, yes.

VICE-CHAIR KAPITANY: So, they had a slide about utility service unreliability and, then, the next one was throughput impact due to weather.

So, that's what you've been talking about, taking out the major factors, and they said

that, where, you know, where they compared on American utilities providers and Canadian utilities providers, with the impact of weather stripped out, can you comment on those slides? I don't know if you have them at your disposal.

MR. PETER HELLAND: I don't have them right in front of me.

MR. CHRISTOPHER OAKLEY: Is -- is it the same slide that Hydro included in its direct on PDF 12?

VICE-CHAIR KAPITANY: No. The impact from service unreliability and, then, the next one was the throughput impact due to weather from the -- from the deck that -- yeah. So, that's the service unreliability and, then, the next slide was the throughput impact due to weather.

So, that's the one that I was wondering about, the comparison with other utilities there, because you had said that Manitoba is far better in terms of reliability when you strip out weather. So, I just wondered if you could relate that to this slide.

MR. CHRISTOPHER OAKLEY: Are we -- do we know whether or not that included the forest fires, because that was a pretty significant contributor in

one of the years --

VICE-CHAIR KAPITANY: I don't --

MR. CHRISTOPHER OAKLEY: It might have been 2019.

VICE-CHAIR KAPITANY: -- believe that the -- that the presenter spoke to that. I think they just spoke to weather in this one. That's -- that's what the slide says and that's my recollection.

MR. PETER HELLAND: So, I -- I'm actually just going to read from the slide.

> "Manitoba Hydro weather-related reli -- reliability results in the fourth-largest impact, Keystone."

So, I -- I think what they're saying is that it's material, it -- it -- it matters. So, my interpretation of just what I read on the plain face is that weather does impact the reliability that customers see and they're trying to show it here in this slide, I believe, just a -- a plain -- plain reading of the slide, as I -- I interpret it here.

VICE-CHAIR KAPITANY: Okay. Thank you.

CONTINUED BY DR. BYRON WILLIAMS:

DR. BYRON WILLIAMS: Mr. -- Mr. Chair,

if I might just in -- in follow-up to -- to those questions, and, if we can go back to Slide 11 for one second, please, Slide 11 of the Midgard evidence.

When -- in terms of the excluding major events, Mr. Helland, does this slide only exclude weather?

MR. PETER HELLAND: No. This -- this slide excludes major events, and Manitoba Hydro, in their filing or IR response to two (2) questions, defines what major events are. It's -- I can't remember. It's like some number of minutes of interruption, but Manitoba Hydro does define it in either evidence or one of their IR responses to us.

But they clarified quite clearly what they define as a major event. So, it's -- it's not related to just weather, it would be -- I mean, it's typically weather, like forest fires, or ice storms, because mother nature, she's powerful.

But it doesn't have to be just weather. It's -- it's more inclusive than that.

MR. CHRISTOPHER OAKLEY: But it does exclude scheduled outages. So, repair outages they specifically exclude from that.

DR. BYRON WILLIAMS: Thank you.

MR. PETER HELLAND: So, one (1) of the

-- the conversations that we -- we've been hearing about, we see in evidence, in our evidence and Manitoba Hydro's evidence, and other people's evidence, is deteriorating asset condition.

So, what about it? Let -- let's have a chat. So, our question is: Is equipment degradation as pivotal as represented by Manitoba Hydro? We've seen this figure a variety of times, showing the upward trend in SAIDI and SAIFI impact from equipment failure.

But actually, following up on Board Members Sy's question about -- or my response to him about scale, let's put that into context. We certainly see that it's trending higher. There's -- there's no objection to that. It's -- it's obvious there in the evidence.

But the question becomes: Is the degradation material? Are the reliability trends noticeable to ratepayers? Sort of an impact on ratepayer's perspective. And with that, next slide, please.

When we look at equipment and its contribution in terms of what ratepayers experience. So, ratepayers experience outages as opposed to equipment failures.

They -- they don't know -- ratepayers don't know why their -- their power is out. They just know, hey, my power is out. So, when we look at these two (2) graphs on the left, it's SAIDI with the -- the solid blue line representing SAIDI with all causes, so including major events.

The -- the dashed blue line excluding major events and then the -- what I'll call the dotted line, the contribution due to equipment failures. What we see, and -- and it's a similar pattern for -- for SAIFI.

What we see is that equipment failures for -- you know, contribute, if you will, approximately 40 percent to -- to the SAIDI outages and approximately 30 percent to the SAIFI. So, one of the observations here is that other factors dominate the change.

They're -- they're potentially overshadowing or they are overshadowing equipment related SAIDI and SAIFI trends. And when we look at what's experienced by ratepayers, this high variability that -- that was discussed earlier, it would be challenging, I -- I'll argue, to detect a trend of a change of zero point zero one (0.01)interruptions per year on something that has one

point five (1.5) interruptions per year.

It's over a hundred (100) times different. Like -- like the change, the change is -- is significantly smaller than the -- the -- what is actually experienced. So, it will be difficult, especially in light of the high degree of variability experienced from year to year.

And -- and the similar story for -- for SAIDI. I'm sure there'll be a bunch of conversation about -- about that in -- in the coming days, but it's important to -- to put equipment-related SAIDI and SAIFI into context of what ratepayers experience, the system impact as opposed to the equipment or the asset contribution, because what -- what ratepayers experience is the -- is the contributions from all causes, not just equipment. Next slide, please.

And, you know, in evidence Manitoba Hydro states, and -- and they acknowledge this, for transmission performance it's influenced heavily by the significance of several major weather events that have occurred in recent years.

Excluding these major events, the performance of transmission is aligned with historic values. Manitoba Hydro's T-SAIFI without major events, and -- and that's our addition just to provide

context -- has shown a slight improvement in the last ten (10) years.

So there's -- there's different stories depending on how you look at -- at the data. And -- and we will assert and we will argue that what we as a group should be focussing on are the -- are the items that Manitoba Hydro controls, which is asset condition and its impact overall, and O&M and its impact overall.

Apparently I -- I get phrasing wrong. We -- we didn't argue; we just stated 'cause we don't do argument. Sorry. I'm not a good lawyer.

But overall, you have to look at all the contributors to what ratepayers experience because that's what matters is what ratepayers experience.

So moving right along, we'll -- we -- we jump right into asset management. So one (1) comment that -- that we will have and -- and you'll -- you'll likely see in conversation is future promises are not today's reality.

AMCL, they wrote a report. It's carefully worded, and it's important to read the words carefully because they -- they talk about current state and future state. And they were quite careful, quite deft at separating the two (2).

But, you know, to recap, Manitoba Hydro's goals: targeted levels of performance at the lowest life cycle costs. And this is consistent with asset management objectives, quoting from ISO 55000:

"A desired balance of cost, risk, and performance."

So you can see the -- the correlation.

The -- the state -- Manitoba Hydro's stated goals align with -- with asset management standards. But when you look at some of Manitoba Hydro's responses to -- to IRs, right now asset -- asset management maturity does not allow for the precise mapping of capital expenditures to performance.

So what Manitoba Hydro is stating is that they have a goal in the future, and -- and we acknowledge that goal, we respect that goal, we support that goal, but their current state of asset management maturity does not allow them to -- to achieve that goal yet.

They're -- they're on a journey, but they're not there yet, and it's not the current state. It's their desired future state; it's not their current state.

And AMCL. So they did a report. It's

a good, workman-like -- like journeyman report. We read it. It's -- there's a lot of good guidance in that report, and one (1) of the things they state is:

> "A complete understanding of asset-related costs, risk, and performance relies on adequate asset data."

And when AMCL graded, if you will, the improvements since the last GRA to -- to this one, the maturity has increased from one point five (1.5) as per the UMS report that -- that AMCL accepted the scoring from to one point eight one (1.81) overall.

But they identified three (3) key areas of weakness, and they are related to asset information, risk in review, and decision making. And, importantly, AMCL specifically said that asset information is constraining Manitoba Hydro's asset management maturity.

So what they're saying is the poor quality, the lack of integration, the ability to use and access and integrate and manipulate their asset information in an effective way is constraining Manitoba Hydro's asset management maturity.

And this is reflected in the scoring. You'll see from the AMCL report asset information has an overall company score of one point three two

(1.32), which is the lowest of the six (6) categories that -- that AMCL assessed, followed by risk in review at one point four five (1.45) and asset management decision making at one point eight three (1.83).

So these are the three (3) key areas that AMCL identified as requiring concerted and diligent effort to address.

And just for context, I think it's been discussed earlier, but broad conformance with the -- with a standard such as ISO 55000 would be represented by a score of three (3). So you can see there's a -- there's a fair distance to go from Manitoba Hydro's current state to broad conformance with -- with a standard such as ISO 55000.

And where does that lead you? Well, if you don't have good data and -- and as -- as per the AMCL report, a poor foundation which is data and your ability to manipulate data, it leads to increased costs and degrades performance -- and degraded performance.

So, you know, Manitoba Hydro responded, you know, standardization gaps that limit comparability and risk across asset classes, and they list -- list them. They mirror what AMCL identified in their report and, you know, there's currently no

alignment of the asset class strategies to the asset management system.

They were developed in relative isolation of each other, so they're silos. There's isolated groups within Manitoba Hydro doing what they can but -- but they're isolated. Next slide, please.

And continuing that issue of poor foundation, AMCL was quite clear: the Asset Health Index data -- well, Manitoba Hydro's clear:

> "Without all the AHI data [so Asset Health Index data] asset failures may not be identified, one. It leads to reactive work."

What I could colloquially call fire fighting.

> "It takes staff off of planned activities."

So you have important planned activities that you are doing because they matter, and they matter to the system and its performance. Staff are being pulled away from those things. It defers work which leads to more work and more reactive work, and it disrupts staff that are performing important planned maintenance activities.

And what you get is, without accurate

asset health, asset condition information, you're -- you're working hard just to stand still. You're not accomplishing what you want. And the result is increased cost, risk, and degraded system performance.

So, changing gears a little bit, with regards to asset management, one (1) of the key things is target -- targeting -- you know, setting reliability targets. And with regards to this, ratepayer desires matter.

Taking a step back, when you look at a ratepayer, they balance many things, and electrical reliability is just one (1) of the things that ratepayers balance in their lives.

They want to put food on the table. They want entertainment or leisure, to spend time with your children. Electric reliability is one (1) of the pieces they want to be able to, you know, take care of themselves, health care, have the -- you know, they need to live.

And when we initially went through and -- and read the evidence, we -- we -- or I specifically had a reaction to the -- the customer survey. As part of the work that -- that I do in -- in Ontario, and specifically, I read the -- the customer surveys and perception surveys in support of

the Ontario Energy Board. And I formed a conclusion about what I was seeing in the evidence with regards to the survey that Manitoba Hydro put forward.

A little while later, I got Rainkie's assessment, and it mirrored my own. It confirmed my -- my interpretation, and hence, why we quote Rainkie fairly extensively in our evidence because it was confirming what I had already concluded based on my experience in Ontario primarily is that Manitobans strongly favour keeping rates as low as possible over other aspects.

And the other aspects, one (1) example would be reliability. So rates matter first, and reliability second in -- in the customer survey. So just to provide some context as to where all that comes from.

So risk. Risk equals probability times consequence or the combination of the two (2). And there'll be additional conversation about this I'm sure, but I want to take the Board through a very simple example of how asset health index is (1) generated.

So this is an example for transmission poles taken out of Ontario. You have a set of criteria: pole strength, physical condition,

accessories, service records. You put that into a scoring matrix, so you go and you inspect your asset. You have a scoring matrix, and you generate an Asset Health Index. First step. So you have an Asset Health Index.

And then what do you do with that Asset Health Index? You take that asset health index and if -- if you have it, and my understanding is Manitoba Hydro does not have it -- have this data, or consistently have this data, is that you have a curve of probability of failure versus health index.

So, you -- you put the health index in, and it gives you a probability of failure of -- of that asset. So, what you're doing is you're converting asset health into probability of failure. And -- and this is done in other jurisdictions and very common, for example, in a place such as Ontario.

So, that's one (1) of the two (2) inputs to risk.

DR. BYRON WILLIAMS: Could we go back to that slide for just a second.

MR. PETER HELLAND: Sure.

DR. BYRON WILLIAMS: Based upon your experience in Ontario, BC, or other jurisdictions, how material is this type of asset health information to

mature asset management planning?

MR. PETER HELLAND: Having a sense of how your assets degrade across time, you know, relating asset condition to -- to performance and longevity is essential. It's necessary. It's a foundational ingredient in planning both long-term and -- and near term.

DR. BYRON WILLIAMS: Thank you. Thank you.

MR. PETER HELLAND: Consequence. We -- we just -- there -- earlier today there was some -- some discussion about consequence or criticality. And the AMCL consultant, you know, identified correctly or, you know, adroitly, that it's dependent on an asset's role in a system. It's not the asset itself, it's the role in the system that the asset plays.

And there's lots of difference consequence types: financial, unserved energy, safety, environmental. For the purposes of today's discussion I'll focus primarily on money and reliability just to -- to focus conversation, but -- but understanding that -- that there is a wider set of consequences that -- that can and should be considered.

So, we have a risk matrix. On one axis, we have probability of failure. And -- and we

discussed previously how asset health or asset condition informs probability of failure.

So, you could take the -- the 'Y' axis or the vertical axis and replace rare, unlikely, notable with -- with actual probabilities. And then you have consequence from negligible to high. Once again, you could replace those with numerical values depending on -- on your system.

And what you do is you -- you have the two (2) values. And then you place the risk on your -- your risk matrix. And -- and different organizations have different risk matrixes. I'm not claiming this is the one Manitoba Hydro should use. This is just for illustrative purposes.

But you will have risks that fall in what I'll call bad. These are risks that, hey, we got to do something about. Marginal, okay, we need to make decisions about these risks, and acceptable, we've decided, yeah, these are okay.

And -- and it's -- there's more to it than this, but -- but at its heart, this is -- is how you calculate risk and evaluate risk. Next slide, please.

So, asset focus versus system focus. We -- we've -- we'll -- we'll hear a fair -- fair

amount about this, and -- and it's in our evidence, and we've heard some this morning.

As asset management matures there's a shift, and it's a fundamental shift, and it's a shift from an asset focus, where you're saying, oh, I just have to take care of these assets, it's in good, bad, or indifferent condition, and it drives my decision-making; as opposed to a system focus, where you say, well, what is the impact, what is the role this asset plays, what is the risk to the system that -- that this asset poses or contributes, and I'll give you an example.

So, one (1) -- one (1) focus is, okay, I've just got to maintain this transformer, and that's an asset focus. A system focus says, look, what ratepayers want to be able to do is, using an -- a personal example, I like to read to my kids at night. They're actually teenagers now, so that ceases to be quite so true, but when they were younger, that was what I did every night.

So, that's my value. I want to be able to read to my kids every night. You know -- you know, a company owner wants a sufficiently reliable system but rates that allow you to be competitive, and that's of value. So, it's -- you'll -- you'll notice the

shift in language.

It has nothing to do with the individual assets, it's what objectives am I trying to achieve? So, you know, commercial competitiveness, being able to read to my kids at night or, you know, the -- the power in the hospital stays on in -- in the event of -- of storms.

And so, it's a fundamental shift. And in Manitoba Hydro's asset management policy they state this. They say focus on the system rather than the individual asset. It's plain right there in the policy. It's -- it's stated. And it's, like, good, that's a goal but, once again, it's a future goal.

So, when AMCL evaluates Manitoba Hydro, the current status is that risk management practices focuses on asset failure risk instead of system failure. So, AMCL is quite clear. Manitoba Hydro is focussing on assets, not the system.

And -- and this is a key -- key point. To -- to mature your system, you have to make that shift from these -- this asset focus to a system focus and -- and that'll be necessary for Manitoba Hydro.

And people said, Peter, that's so theoretical, quit -- quit being so crazy, it's philosophic, I don't understand it. So, I have a

hyper simplified utility here. There's one (1) transformer and one (1) load.

And in terms of an asset focus, we say, oh, transformers of this size we replace when condition, you know, is about to exit fair.

In a system focus, it may lead to the same outcome. You replace it when the asset condition is going to be exiting fair, but the logic -- the language is very different.

You're going to say, this asset is serving this -- a load of this size and this importance and, as a result, assets that are supporting that, in this case, the one transformer, get replaced when the condition is fair to achieve that outcome for the ratepayer.

And it's -- it's an important but -- it's subtle but important shift in language because one (1) is focussing on the assets and one (1) is focussing on the system and the value it delivers to ratepayers. Next slide, please.

So, perhaps over time you decide, hey, one (1) transformer isn't doing the work for me, it's not meeting my needs, so you implement redundant supply.

You now have two (2) transformers, a

switch that will switch from transformer A to transformer B should transformer A fail, same or similar load.

Costs have more than doubled. And the reliability is better, but it's less than twice as good. So, now ratepayers are bearing a burden. They've got slightly better reliability, but costs have more than doubled.

And one (1) of the questions becomes: huh, is that the appropriate tradeoff? And the answer is, okay, that's a good question. And if the answer is no, what can you do about that? Well, one (1) of the things you can do is, once again, put on your system focus as opposed to asset focus.

So, instead of replacing transformer A and B -- and we'll move to the next slide, please -- replacing transformer A and B when their condition reaches fair, which would be an asset focus because transformers of that size we always replace when they -- they get to condition or are about to exit fair, you get to a system focus.

And you say, huh, ratepayers want a slightly different tradeoff with regards to system reliability. And what we do now is we allow -- or we plan -- actively plan for the condition to degrade

slightly further before we replace those transformers.

So, what we do is we extract more value from the transformers. We still have better reliability. And most of -- you know, most of the reliability improvements, in fact, the lion's share typically, but costs are not doubled anymore, they're -- they're lower than doubled.

Yes, Vice-chair Kapitany?

VICE-CHAIR KAPITANY: This might be a really dumb question, I apologize if so, but could you go back to --

MR. PETER HELLAND: I doubt it.

VICE-CHAIR KAPITANY: -- 32.

MR. PETER HELLAND: Yes.

VICE-CHAIR KAPITANY: So -- so, you say the cost is more than double, but the reliability is better but less than twice as good?

MR. PETER HELLAND: Correct.

VICE-CHAIR KAPITANY: How can you categorically make that statement?

MR. PETER HELLAND: Well, I'll say that's based primarily on experience, but... So, for example, with just a single transformer, reliability would be what I'll call acceptable, like, kind of what I'll call normal.

And then over time, you say, well, it's not quite as good, the load's a little bigger or -- or something has changed, I want it to be just that much better. There -- there's a reason driving -- I just -- it's falling below a threshold. And you say, Look, I want it to be better. And -- and you -- you add two (2) transformers.

But let's say the original transformer was giving you -- I'll just use a number -- 90 percent reliability or 95 percent reliability or whatever the number is. When you add the second transformer, it doesn't become, like, 190 percent reliability because you're -- you've got two (2) transformers now. It's going from ninety (90) to --

BOARD MEMBER KAPITANY: Ninety-five (95) or whatever.

MR. PETER HELLAND: Yeah, ninety (90) or ninety-five (95).

BOARD MEMBER KAPITANY: Okay. I got your point. Thanks.

MR. PETER HELLAND: So it's better, but it's not double. It's -- it's an incremental improvement.

MR. CHRISTOPHER OAKLEY: On a system basis, we talk about nines, right? So you're going to

get ninety-nine (99), ninety-nine-point-nine (99.9), ninety-nine-point-nine-nine-nine (99.999). So it's how many nines.

And -- and that's why you're getting incremental improvements, but you're paying dearly for each step. This is a very non-linear process and your marginal dollar is not getting you anything like your first dollar got you.

This is why, when you're working with multi-billion dollar systems, you have to make those optimization decisions quite carefully because any small improvement in optimization multiplied by billions is a big number. And it's important to people to get that.

BOARD MEMBER KAPITANY: I was thinking more, if one of your transformers there failed, you've got the other one there. So -- so you are -- you're having much better reliability than you would be with just one. But you're saying it's marginally better.

MR. CHRISTOPHER OAKLEY: Yes. Because it's --

MR. PETER HELLAND: That's correct.

MR. CHRISTOPHER OAKLEY: -- first of all, it's a low probability event for transformers for fail. Partly because you maintain them and monitor

them. And if they start to off gas, you get rid of them before they blow up and things like that.

But you -- again, your -- your reliability with just a typical radial line, you might lose some hours of service in a year. You know, if you're on a long rural line, lightening will hit it or a bird gets into the lines or a tree falls on it, and you're going to lose some hours. But you're not going to lose half the year. You're not going to lose even a month.

You know, people will get out and fix that reasonably quickly. If it's a catastrophe, it may take a couple of weeks. And we've seen that recently in Quebec.

So they had vast amounts of ice and it pulled down all sorts of really important structures. And they got onto it pretty snappily and it still took them a couple of weeks to get everybody back online.

But again, you're not losing a thousand (1,000) hours.

BOARD MEMBER KAPITANY: Okay. Thanks.

BOARD MEMBER SY: Yeah, I just wanted to, sort of, ask if it is -- if it is sort of (INDISCERNIBLE) to what we were told earlier about the last load. Is that -- is that the same concept? The

marginal value of the -- that last minute of reliability, the (INDISCERNIBLE) custom, is that what you are referring to here?

MR. PETER HELLAND: So it -- it's part of that conversation. It's not the -- the valuation of it is -- is sort of a different topic.

But yeah, there --

MR. CHRISTOPHER OAKLEY: Well, for example, and this is from personal experience. We had a very large industrial load in Alberta, a big oil refinery. If they had a very, very brief blip, it's six (6) cycles. So, you know, basically, a -- you know, a few thousand sub (sic) a second basically.

That would actually trip off their catalytic cracker and they'd have to purge their entire system, have an environmental excursion, and -- and millions of dollars of product lost. That's for a very, very short blip.

So what ended up happening was a second line had to be brought in from an independent source and -- at some cost. And an automatic transfer switch put in that would actually avoid that short duration outage.

Very, very expensive investment to get a very small change. But one that is very important

to that customer.

But every customer doesn't need that. Not everybody needs millions of dollars investment so that they get through that six (6) cycle blip.

You know, if you're a silicon chip manufacturer, you can't a thousandth of a second off because it'll destroy your entire production line.

So they actually put very sophisticated behind-the-fence systems in to avoid that. They actually, you know, have a battery storage or some other types of storage. And they'll drive their systems off of the battery so that if there's a blip on the system, they don't see it through the battery. Because they can't avoid -- they can't afford that.

And hospitals do something similar too as well. And so do control systems, for example, utilities. They typically always go through a battery so that they don't actually see system blips because utilities know that utilities have problems.

MR. PETER HELLAND: Does that answer your question, Board Member Sy?

BOARD MEMBER SY: Yes. I guess just to maybe -- your presentation today is focusing more on residential. Is that -- is that where you are coming from rather than --

MR. PETER HELLAND: So we -- we focus on residential, yes. But many of these principles are also applicable to industrial and commercial.

So it's not -- it's not exclusive to residential, if you will. These types of principles will apply to industrial as well.

MR. CHRISTOPHER OAKLEY: The value of loss load, as we've seen, is very different and it depends on the industrial as well. Not every industrial has the same sensitivity for lost load.

So those have to be, kind of, dealt with on a more unique stand-alone basis. You have a customized solution, typically, to deal with those sorts of things.

You would want to build a large power grid that was able to serve the most sensitive industrial customer across the entire system because you're now going to -- not -- not double the cost of the system, you'll quintuple it. You'll -- you'll put solid bust bars between everything and -- and your costs will go through the roof.

So no one would suggest typically doing that. It wouldn't be a prudent investment. You target those solutions to the particular customer.

BOARD MEMBER SY: Okay. Thanks.

CONTINUED BY DR. BYRON WILLIAMS:

MR. PETER HELLAND: So next slide, please. Oh, and next slide.

So pulling some of this together. And here's a -- a DC Bipole example. You're going to hear a lot about this.

So Manitoba Hydro, in their evidence, they provide asset focused evidence. Manitoba Hydro. Trends in recent years have shown HVDC reliability is declining, shown in figure 7.6. You've seen this figure multiple times.

In our evidence, the operative question becomes -- is whether Bipole availability reductions are actually causing system and ratepayer impact. So we asked a series of IRs around this and there's been discussion about this, I understand, preceding this.

So that becomes the question is: Are there actually impacts? And what are they? And who are they -- who are they for? So next slide, please.

DR. BYRON WILLIAMS: Actually, before you leave slide 35, just go back there for one second. Thank you, Ms. Schubert.

On or about 2018/19, there's a green line there that's starting to appear. Can you

indicate what that is, please?

MR. PETER HELLAND: Oh, okay. So that's Bipole III. The -- the addition of Bipole III.

So the different colours are the different Bipoles. Bipole I is in blue. Bipole II is in -- is it amber or yellow, I can't really tell. And Bipole III is in green. So -- so it's showing the -- the three (3) different Bipoles.

So when we asked IRs about DC Bipole loss impact, Manitoba Hydro responded with, Bipole II failed, all load. And this is all load including winter peak. So the single highest load hour of the year can be served on peak with zero (0) impact.

So Bipole II can be gone and, during winter peak, all load can be served. And this is without imports. So without imports coming into the province.

With Bipole II -- I and II failed, Manitoba Hydro could still supply load through most of the year. So maybe not the peak few hours of the year, but most of the year, without imports. So without relying on imports. If you rely on imports, now can -- can serve all -- all year.

And as discussed, I believe, yesterday or the day before -- it's starting to blur for me --

but reading the transcript and looking at the -- the filings, for PUB-24, if Bipole I failed, all load can be served on peak. So for that single hour of the year -- the single peak hour of the year -- with some imports.

So we have the -- the asset story of, Oh, look at this terrible asset performance. Got to replace it. No questions asked.

As opposed to, Okay, there's a more nuance story here. What is the actual risk to the system, as opposed to the asset?

And so, when we look at system impacts versus individual asset impacts, we have slightly different stories. Much more nuance stories and sometimes more difficult to -- to deal with. But -- but they're there and they need to be told.

THE CHAIRPERSON: I thought your argument was going to be somewhat different because one (1) of the arguments for Bipole III was redundancy. And if Bipoles I and II are close together and if we have an ice storm and lose them, we have backup in Bipole III. But --

MR. PETER HELLAND: Okay. So let's go back a slide. So --

THE CHAIRPERSON: But I assume you're

-- if we didn't have Bipole III, and Bipole I and II failed, what would we do?

MR. PETER HELLAND: So if Bipole I and II failed --

THE CHAIRPERSON: Yeah.

MR. PETER HELLAND: -- and we had Bipole -- well, then you would -- so I'm just trying to work out the math here. You would be importing heavily through MMTP and -- and other imports to -- to make up the loss.

And presumably, you would have another way of getting -- like, Bipole III is the way to get generation out of the North and --

THE CHAIRPERSON: Right.

MR. PETER HELLAND: -- and to the centre. So --

THE CHAIRPERSON: But the -- the argument of redundancy, which was one of the arguments put forward for Bipole III, you're saying it's an irrelevant argument?

MR. PETER HELLAND: Okay. So -- so -- okay, so this is a very important point. We are not arguing to sort of go back into the past and -- and reevaluate past decisions and whether they were good, bad, or indifferent, none of that. You have the

system you have today.

So, when you go to evaluate investments in the future --

THE CHAIRPERSON: Yeah.

MR. PETER HELLAND: -- or in this proceeding, you now have the system you have, and you base your decisions accordingly. So, you have Bipole III.

THE CHAIRPERSON: Right. But I guess the problem is -- and I don't -- you know, I don't -- I don't want to hold this thing up. Kristen, can you go back to slide 24.

Okay. Manitobans strongly favour keeping rates as low as possible over other aspects. Is -- is the -- the answer to the question dependent on when you're asking the question?

I mean, if you have a reliable system and you start asking about rates versus reliability, you may get one (1) answer. If you ask the -- if you ask the question --

MR. PETER HELLAND: M-hm.

THE CHAIRPERSON: -- in Quebec after they've lost power for two (2) weeks, you might get a different answer. Or if you -- if you lost power here in the winter, you might get a completely different

answer, wouldn't you?

MR. PETER HELLAND: Yeah, there'll be some sort of recency bias. I would, you know --

THE CHAIRPERSON: I mean -- I mean, I looked at -- and -- and I was checking at it. The -- the marketplace in -- in the United States, which is pure market driven because they wanted the lowest possible cost, and they cut themselves off, was Texas, which -- which claimed the independent state of Texas, which was great until they had the ice storm in 2021 and you went from five dollars ($5) a month to, I heard in one case, five thousand dollars ($5,000) a month.

I guess the question is if you ask them which system do you want, it depends when your timing of the question is?

MR. PETER HELLAND: The timing of the -- sorry, the timing of the question will, I'm sure, influence opinion. I -- I don't --

THE CHAIRPERSON: Yeah.

MR. PETER HELLAND: -- disagree with that. But what's important is when you frame your study, your -- your study, and you -- you ask those questions, you frame it in a way that's insensitive as possible to those types of timing issues and -- and

addresses those.

THE CHAIRPERSON: Okay. Yeah.

MR. CHRISTOPHER OAKLEY: And we wouldn't dispute that people get used to what they get used to. So, if you get air for free, you don't think air's worth anything.

THE CHAIRPERSON: Right.

MR. CHRISTOPHER OAKLEY: But if someone tries to cut your air off, it's worth a great deal. And -- and I think the people of Quebec actually have done this a couple times in the last few decades.

They had a big ice storm in the '90s. They actually changed their standards. They decided that they were going to build a more resilient and more robust -- they just changed their tower standards and actually said, we're going to live through 2 inches of ice. I'm not sure what the exact number was, but they actually definitely jacked up their design standards because they said, we can't black out the city of Montreal for two (2) weeks.

THE CHAIRPERSON: Right.

MR. CHRISTOPHER OAKLEY: It turns out that nature found a way to get around that one, and, actually, they got to black out the city of Montreal,

or parts of it, for two (2) weeks again.

So, you can try and design around nature, and you do your best, and you choose standards. Just to point out, that's not what Hydro's proposing in any of what we've seen in evidence so far.

They're not saying we're going to make a more resilient system by changing our design standards, we're not going to avoid forest fires by using steel poles in distribution, which would help you with -- with that, because that's -- there's a huge -- there's a huge cost to deciding to change standards, and you have to do that in a measured way and justify why you're doing it.

But they're not proposing that. They're saying, the stuff's getting old and we're going to replace it.

THE CHAIRPERSON: Yeah.

MR. CHRISTOPHER OAKLEY: And that's where we want to focus our discussion mostly.

THE CHAIRPERSON: Yeah. Okay. Thank you.

CONTINUED BY DR. BYRON WILLIAMS:

MR. PETER HELLAND: I'm not sure how

to say forward many slides. Whoa, someone's much better than I.

So, that brings us to minimum system concepts in -- in our evidence. Ratepayers ultimately bear the cost risk of -- of the system or any system over built.

Once again to restate because it's important, targeted levels of performance and risk at lowest life cycle cost; that's Manitoba Hydro's stated goal.

And Manitobans stated desire, once again, sort of a recap, they strongly favour keeping rates as low as possible over other aspects. It's not to say they're exclusive. There is always a balance. But keeping rates low is -- is what Manitobans have -- have said and -- and what the evidence indicates.

PUB Order -- I'm not sure if you say '20/07 or '20/07 -- it has been Manitoba Hydro's recent policy and practice to make investments in generation and transmission with the export market in mind.

2014 NFAT report re: Keeyask, MMTP, and Bipole III. Domestic customers make up for the export shortfall through rates.

So, it's been identified in -- in

previous hearings that domestic ratepayers are making up for shortfalls through rates, so through -- so export shortfalls through domestic rates.

And the question then becomes: Are ratepayers paying for a system that is more costly than would be needed to reliably meet domestic requirements? And this is where the concept of minimum system comes in.

DR. BYRON WILLIAMS: Before you -- just to go back to slide 38. I think you said this previously, but are you talking about revisiting NFAT and Bipole III --

MR. PETER HELLAND: No.

DR. BYRON WILLIAMS: -- or alternatively, is this a forward-looking discussion?

MR. PETER HELLAND: So, to be very clear, there's no -- you have the system you have. We are purely forward looking so that when we evaluate investments, you know, in this proceeding and -- and going forward -- and investments are both capital and budgeting for O&M -- just to be clear, it's a holistic view -- it's the go-forward decision-making. There's no -- you have the system you have, and -- and it's a lovely system.

So -- so, just to be clear, it's always

on a go-forward basis that you do your evaluations; there's no hindsight.

MR. CHRISTOPHER OAKLEY: We consider your system to the Porsche of systems. And so, you know, there was a nice little Volkswagen drawing in -- in Manitoba Hydro's direct evidence. True, the Volkswagen does make both Porsches and Volkswagens, but I think you've got the Porsche end of that deal, and -- and it's a very impressive system.

There's very few places in the world that you will see the kind of technology and -- and robustness in a system that Manitoba Hydro has built here. And people are used to that, so there will definitely be some cost tension if you decide to consciously allow the performance to deteriorate slightly to moderate rates.

Or if you're going to maintain or increase performance, you're going to pay an awful lot to get better than a Porsche, so maybe you'll move up to the Lamborghini, but -- but this will not be cheap.

MR. PETER HELLAND: So, in evidence we've seen what I'll describe as we're doing better than our neighbours. And to be clear, that does not equate to lowest cost.

So, the -- the state of goal is lowest

cost. Saying that you do better than your neighbours doesn't equal lowest cost. And this is a graph from the -- from a recent Hydro Quebec 2022 comparison of electricity prices across Canada.

And you will see Winnipeg, the -- the city of Winnipeg, is the second lowest line there, so the second lowest rates, but context is important. And -- and if we go to the next slide, Manitoba Hydro is middle of the pack of the three (3) hydros in Canada and losing ground.

Manitoba Hydro's appropriate cross peers are not your neighbours necessarily; they are the two (2) other major hydroelectric utilities or jurisdictions not -- I guess it's in North America, but certainly in Canada, BC Hydro and Hydro Quebec.

And when we zoom in, what we see is that Manitoba Hydro is trending towards no longer being lowest or -- or middle of the pack of the three (3). They may be top of the pack of the three (3) or the most expensive of the pack of the three (3) hydros if this trend continues.

THE CHAIRPERSON: Sorry, but don't you run in -- does this take into account Keeyask?

MR. PETER HELLAND: Does this include Keeyask?

THE CHAIRPERSON: The -- the cost, you know, when you're doing costing of it. So, we built Keeyask. Site C's not on the books yet. Quebec Hydro's going to build, I understand, four (4) more dams.

So, if we go out five (5) years, what's the trend line? I mean, we had this -- quite frankly, we had this argument in the interim from -- from Manitoba Hydro on debt/equity, comparing us to -- to BC, except it hasn't hit the balance sheet.

And -- and, you know, again, timing -- timing's really important in this. And we're ahead on Keeyask, and it's hit our balance sheet, and we're going to have costs for Keeyask.

Site C, you know, and there was a -- the -- the discussion this morning about the increase. You know, it was, I don't know, 25 to 30 percent. Site C doubled. I have no idea what Quebec Hydro's --

MR. CHRISTOPHER OAKLEY: I think it actually quadrupled if you look back on when it was built --

THE CHAIRPERSON: Well, the starting cost's at 8 -- 8 billion, and now it's between 16 and 18 billion, and --

MR. CHRISTOPHER OAKLEY: Yeah.

Certainly timing's important.

THE CHAIRPERSON: -- so if you -- if you go -- if you move this -- if you move this forward five (5) years when you've got projects built and -- you know, and I hear how wonderful Ontario is OPG, except they're going to build more dam projects, you know, I mean, I don't know how it affects this, but I guess I'd just put out, again, when you hit the time frame, you've got to hit projects -- you know, let's look at what the costs are when the projects are completed to -- to do the actual comparison.

MR. CHRISTOPHER OAKLEY: I don't think we want to defend Site C or -- or Muskrat Falls or some of these other projects. I think the point here is that if you're trending -- the only people you really can compare Hydro to are the other two (2) hydros.

Storage hydro is very unique, and -- and you'll see this complaint when Hydro publishes this from other utilities. They'll just say, well, you can't compare us to them 'cause they have free energy, effectively.

So the -- the three (3) storage hydros are really the only comparators to look at, and -- so there certainly will be some ups and down, and we

certainly haven't gone wild with excitement that Hydro -- 'cause we live in Vancouver, that -- that BC Hydro is building Site C, and we know that that train is coming towards us right now.

But they're doing other things to try and manage those costs as well 'cause they're -- they're aware that that -- that is coming. The -- the problem is -- is, as Peter says, is this the -- is this the lowest-cost system you're shooting for?

If the intention is to build these assets so you can make money on exports, have you actually done the risk costing of that revenue stream against the asset? Because at the end of the day, your ratepayers, your domestic ratepayers, hold the bag, right? They -- they own that cost.

If revenues are good, fantastic. If revenues are bad, they -- they still have to pay. And so that's -- the -- the equation needs to be -- and that's why we talk about minimum system. How much do I need to serve my customers? And what am I building for opportunities in export markets?

And -- and I've got to value those differently. I need reliability and risk managed for my customer domestic load, and I need to see a business case that supports that other stuff. And

when you mush them together, you can't tell what you're spending on, and you can't apply the same metrics against those investments 'cause they're not justified on the same basis.

So I'm sure we're going to talk a lot more about that with various counsel in the next couple -- or the next day, so.

CONTINUED BY DR. BYRON WILLIAMS:

DR. BYRON WILLIAMS: Mr. Oakley, just on -- on that point -- and you seem pretty emphatic about it and talk about future investments -- does -- do -- does any particular investment come to mind when you talk about that mushing together?

MR. CHRISTOPHER OAKLEY: Well, there are certainly a few that are in -- right now in -- if we're just talking about minimum system, you would cast a different eye upon things like, well, for example, Grand Rapids Unit 4.

So right now the story is, well, we have to fix it because -- we have to replace the runner because otherwise we're going to spend a lot of money maintaining that runner.

If it was excess to your needs, what you could say is, I'm going to mothball it or else I'm

going to actually it only on peak. I'm going to save the number of operating hours until I really, really need it.

Alternatively, I could invest $30 million right now on a new runner, but how would I know if that $30 million -- which is really going to primarily be into my surplus system? 'Cause if I didn't need it, I didn't really need it to serve domestic loads.

Have I actually costed that against what I'm going to get for it? So I've never seen -- there certainly is no evidence here that says, Our business case for this $30 million is we're going to make a whole bunch more revenues, export revenues.

That's not how it's being sold. It's being sold as, My asset condition is really bad and I have to fix it. And I -- as -- as an operator of Hydro assets, I know how they feel.

You know, you're welding things all the time, you've got outages, your forced -- your forced outage rate is going through the roof, and as an asset operator, you're just I've got to fix this thing.

But the system perspective might be, Just turn it off for a while. We'll have some room for that in the budget in the future. Right now, if

it's surplus to your need but you say, I've got to fix it anyway, well, show me the dollars.

Show me where the money's coming from to pay for that 'cause you don't need it for reliability. You don't need it 'cause you need the excess capacity. Pointe du Bois looks a little bit like that, too.

I mean, it's -- it might be a great project, but you can't pull it out and separately say, Well, what's -- what's the economic -- what's the revenue stream that's going to pay for that thing?

'Cause I might not need it right now for my base system, which is why we brought up the minimum system concept here is right now there's no visibility. There's no transparency. What do you need to serve domestic loads? What do you need to take advantage of export markets? They're both like this, mushed together.

MR. PETER HELLAND: And with that, next slide, please.

So a minimum system example, and Chris will have stolen some of my thunder, but you're going to get a bit of repetition here, and hopefully that's okay.

So Chris mentioned transparency. What

is required to serve domestic load? What is economically driven? So what is driven by reliability concerns? What is driven purely by economic needs?

In -- in this example, it's a very simplified view of a utility: four (4) generators, three (3) large, one (1) small, four (4) transmission lines, three (3) loads, some planning reserve margin -- - okay, in this case, 12 percent planning reserve margin -- and exports. So it's a simplified utility, but -- but it will help -- help hopefully to -- to illustrate the concept.

And Manitoba Hydro has said, Eh, we can't give you a minimum system. It's all lumped together. There's something in here to serve domestic customers' reliability and there's some in here to serve exports, but we can't (INDISCERNIBLE) it.

So when we look at it from a minimum system basis -- and this is a basis once again for evaluating future investments, not doing a retroactive look at your system, just evaluating future system -- we argue -- or we don't argue, we -- we provide evidence that you can do a minimum system.

And in evidence, we provide a little bit of a -- a recipe and some simplifications you can do to make the -- the job tractable, but when you do

that, let's say you find, oh, I need two (2) large generators, one (1) little one, three (3) transmission lines, and that will serve our -- our loads, and, to be clear, serve them reliability.

So it's not a stripped-down, bare bones, this is awful system. This is -- no. This is serving targeted reliability system and -- 'cause that's what we're -- we're talking about. We're not talking about other things. We're talking about, okay, the reliability that people want.

And you can do this analysis, and what you will do if you do this is you'll identify, oh, this is what I need for my minimum system. And there'll be some caveats and complications. I understand that. This is a simplified example, but you can -- you can do this, and then you will identify some assets that are surplus. Yes...?

VICE-CHAIR KAPITANY: On slide 42, when you say in the top there:

> "Transparency: what's required to serve domestic load and what is economically driven?"

So you're saying economically driven is the net export revenue and domestic load is not economically driven?

MR. PETER HELLAND: That is correct. So -- so domestic load, you're trying to achieve target reliability and risk at least cost which is a particular evaluation approach.

Exports or assets targeted exports, it's purely economic. It's -- it's money. Like, okay, do I -- do I want to have firm contracts? Okay. Does that pay? How about participating in the spot market? How about participating in different ways?

There's -- there's a sophistication around that and a complexity around that, but -- but they are different evidence bases for -- for your -- for decision-making.

VICE-CHAIR KAPITANY: (INDISCERNIBLE) economically driven because residential ratepayers and, you know, small and large commercial customers pay for the system as well. So to me, that's -- it's all economically driven. It's just a matter of how you segment those two (2) to the domestic market and the export market.

MR. CHRISTOPHER OAKLEY: It might be a horse-cart thing. So in the case of your residential and industrial domestic customers, they need reliability, and they'll have to pay at we'd like to think the least cost to get that reliability, whereas

for exports, we're not -- I wouldn't think that Manitoba Hydro's trying to make the Minnesota system more reliable.

They might be, and they might incidentally do that by building MMTP, but that's not the focus. The focus is to actually harvest revenues for export -- from exports. So the driver in that case is the economics, and you have to meet NERC reliability standards and you have to make sure that the thing doesn't degrade the reliability of your system.

Now, of course, we know that MMTP actually improves the reliability of your system, but you wouldn't have actually made the investment to do that. It's -- it's too costly just for the small -- you know, going from nine nine nine (999) to nine nine nine nine (9999), you wouldn't pay that much for it. But you get that as a side benefit 'cause you decided to -- to justify it notionally on economics.

We -- we might argue that you don't know what actually you bought with MMTP and Bipole III and Keeyask because they also got aggregated into that other -- what was already a surplus system. And so sorting out the windfall earnings that happened in the big -- in the big water year that just recently

passed, you would have made some of those dollars anyway with the existing system before those were added.

And I don't know if anyone has actually analyzed to make sure that the incremental spend on those assets was paid for in that one year of excess profit.

So, when you get minimum system you don't get just minimum system. You will have a lot of times, because it's a capacity based system, where you've got lots of capacity to sell to the markets still anyway, even if it's the minimum system.

But the question now, is the next step to add incremental capacity, do you actually get paid back for that investment. And that's a question that I think Hydro's told us they can't answer, 'cause they don't know what the minimum system is. And they didn't seem to be interested in actually discovering it. They -- they might be, I -- I -- I shouldn't attribute that to them, but they said they can't do it.

We -- we think they're pretty sophisticated and they could model it if they wanted to.

BOARD MEMBER SY: Sorry, I -- I was

trying to understand the concept of minimum system. So, is it -- is it basically just taking, using a mathematical formula, you're taking a portion derivative of system with respect to a new additional unit.

MR. PETER HELLAND: Yeah, that might be right.

BOARD MEMBER SY: Okay.

MR. PETER HELLAND: Like, you're -- you're looking at the -- well, there's one -- one step is like, okay, I'm going to add in a marginal or an incremental investment.

BOARD MEMBER SY: Yes.

MR. PETER HELLAND: It's either going to be serving a reliability need or risk need for my domestic ratepayers, in which case you're -- you're simply trying to achieve lowest cost to -- to achieve that, or it's not needed for reliability.

In that case, the incremental cost has to exceed the -- or has to be lower than the incremental benefit. So the -- the benefits have to outweigh the cost on a purely economic basis, because it's export driven.

And -- and there's a -- but I think in terms of what you're asking, is you'll have a -- a set

of investment options you'll have a curve and you're -- you're wondering at which point do I get -- I'll -- I'll describe it as an inflection point, where all of a sudden the benefits start to be negative for -- for incremental improvements to the system.

BOARD MEMBER SY: It -- well it --

MR. PETER HELLAND: But when you say "derivative," I'm just trying to picture the math.

BOARD MEMBER SY: Partial derivative. So, basically, you're holding everything constant and are just focusing on what you are adding --

MR. PETER HELLAND: Yes.

BOARD MEMBER SY: -- and the value it is adding to the system.

MR. PETER HELLAND: Yes.

BOARD MEMBER SY: Exact. So, you are -- you are holding everything constant.

MR. PETER HELLAND: Yeah, that would -- that would be correct.

BOARD MEMBER SY: And focusing on the incremental.

MR. PETER HELLAND: Yes.

BOARD MEMBER SY: Okay.

MR. PETER HELLAND: I -- I -- I think the answer is yes to your question.

BOARD MEMBER SY: That -- that's partial derivative.

MR. PETER HELLAND: Yeah. Okay. Yes, yes, it is. Okay. I'm catching up. I've missed the -- the partial part. Nope. Yeah, okay.

BOARD MEMBER SY: I'm -- I'm a teacher, so.

CONTINUED BY DR. BYRON WILLIAMS:

MR. PETER HELLAND: So, yeah, so there's two (2) justifications for -- for a minimum system to serve domestic ratepayers, it's -- it's a, you know, a reliability risk at least cost, or things that are surplus to that it's -- it's an economic justification.

And then, as your system changes, some of these classifications will adapt with time. So, in this case we added a load, a house, and now the -- the - the generator swap. So, it's not a static thing, it -- it's changing through time, once again with that forward looking mind set. And -- and this should all be tractable for -- for -- for Manitoba Hydro.

It's -- and -- and, you know, there -- there's some, you know, sort of suggested simplifications in -- in our evidence, that make it

tractable, if -- if Manitoba Hydro does this or -- or chooses to -- to do this, we believe they can.

And -- and the key there is you will then get transparency. You'll get transparency around what is the intent of this investment? What is it serving? And is it meeting that need appropriately, i.e., domestic reliable system at lowest cost or it's -- it's economically driven.

MR. CHRISTOPHER OAKLEY: We would actually say that you can't do that partial derivative right now --

MR. PETER HELLAND: Yeah.

MR. CHRISTOPHER OAKLEY: -- because you don't know the piece that you're going to hold static.

I guess you could always assume that everything right now is a minimum system, and everything that's going to add incrementally, I'm going to now look through that lens.

But, frankly, there's a lot of surplus built into the existing system and that's not a bad thing if it more than pays for itself.

THE CHAIRPERSON: So, I -- I guess the question I have is: Did you -- have you read the Brad Wall report?

Brad Wall looked at Keeyask. Brad Wall is the former Premier of Saskatchewan. He was brought in by the government of Manitoba to look at Keeyask and the cost related to it.

And one of the -- one of the recommendations was that ratepayers should be paying for domestic costs and if the government wants to build for export, the government should be paying for that. Is that something similar to this?

MR. PETER HELLAND: It would allow you to have that conversation.

THE CHAIRPERSON: Okay.

CONTINUED BY DR. BYRON WILLIAMS:

MR. PETER HELLAND: And, I haven't -- I think I've read parts of the report. But it was so long ago, I've effectively not read the report for the purposes of this proceeding, in answer to your original question.

So, minimum system, it provides ratepayer transparency. You know, as Chris described, Manitoba Hydro has some surplus system for firm and non-firm exports, even in poorer water years.

Trade is -- trade is a powerful tool. Manitoba Hydro claims it is unable to identify its

minimum system. We respectfully disagree and feel that Manitoba Hydro is more capable than they are saying they are.

Therefore, Manitoba Hydro, at this time, can't appropriately justify its proposed capital investments. There are investments to remain reliability and -- and therefore the minimum -- they are targeted at the minimum system and surplus system investments should stand or fall slowly -- solely on their economic merits.

So, establishing a minimum system enables one transparency between reliability oriented or domestic system, or minimum system investments, versus economic investments. And it provides transparent justifications to you. It -- it makes your job more straightforward. It's -- it's clear. It's a -- it's either business case -- case A type or case B type.

And without minimum system, least cost is unknown. We've, you know, you probably heard it at ad nauseam, but the stated goal is least cost. You can't know that currently.

And determining minimum system enables a system focus. It changes the orientation to a system focus and asset -- or helps you make that

change. It's not -- it's not sufficient in and of itself, but it helps you and it enables a system focus. Next slide please.

So, one of the things I'm sure there'll be lots of conversation about is the 10 percent BOC reduction that we recommend at the end of our report. And the 10 percent reduction is justified for a series of reasons.

The sixty (60) year old strategy of over building for the future -- it's outdated. The -- the growth rates, we don't believe support that.

SAIDI/SAIFI performance is superior. You -- you have a very good system and it is performing very well, relative to your -- other Canadian utilities.

Ratepayers have said in -- in -- in surveys that they value rates over other aspects, e.g., reliability. Assets are aging, there's no doubt about that as -- as Manitoba Hydro transitions from the rapid growth utility to more sustaining, the assets demographics are aging overall. This is expected and this is normal, and -- and -- and common across North America.

As identified by AMCL, asset management maturity is constrained. AMCL identified three (3)

key areas and I'll -- once again, highlight one in particular and it's the asset health indices.

They're driven, you know, as a whole not fit for purpose, and they are constraining Manitoba Hydro's asset management maturity growth. And is as per AMCL.

As a result, Manitoba Hydro has -- has put on the record the system is not optimized and O&M versus capital, it's not traded off well. It's not -- not also done across business units.

And there's a lack of system focus. There is a potential for deferrals and we're not here to select the exact candidates. We have -- we have a -- a list that we think, you know, are candidates, but we're not picking one over the other at this time.

But, some examples are DC Bipole investments, Point Du Bois, Grand Rapids Unit 4. And to be clear, we're not saying, don't invest in them, or -- or take some remedial action, what we're saying is consider deferrals.

So, you know, does it have to be done today? Can it be done in a few years and how would you -- how would you bridge that and what are the risks that you take on by doing that?

And minimum system.

VICE-CHAIR KAPITANY: Can I just ask you --

MR. PETER HELLAND: Yes.

VICE-CHAIR KAPITANY: -- this morning, Mr. Pawluk gives a really good kind of description of the actions -- the scope of actions that are available.

So, one was refurbishment and then there was maintenance and then he talked about replacement or deletion if something's become obsolete.

MR. PETER HELLAND: Yes.

VICE-CHAIR KAPITANY: But I -- he also spoke, I think it was Mr. Pawluk, who spoke about the fact that, with some of the older assets, it is very hard to get replacement parts and the more time goes on, the more difficult that becomes, is I believe what the argument was.

So, could you speak a bit about that?

MR. PETER HELLAND: Okay. So, those -- those options that you listed are -- are options that are available to you and they are part of your toolkit. And he is correct that, as certain assets age out, it becomes more difficult to either find the equipment to do direct replacements. So, the -- the

scope of the -- the work grows and becomes more expensive and what that does is it sort of shifts your -- your value proposition.

So, when you look at it, you say, okay, huh, this is becoming more expensive, and -- and, if you want to think about it in terms of a -- a Dispatch Order or a value to ratepayers -- value to the system, as those older assets become more expensive per benefit received, if a certain avenue was pursued, they become less attractive with time.

And -- and so, he's -- he's not incorrect when he says that, and -- and what that would imply is you -- you start to adopt different strategies or you -- you defer as you wait, okay, now, it's more valuable, if we wait five (5) years. We use it in a limited, very focussed way.

I'll give you an example. In British Columbia, there was a -- a peaking system -- a Burrard thermal. They had some very old boilers became comparatively unreliable, relative to BC Hydro's other assets, and they were quite clear in their regulatory filings. We are only going to use this on winter peak, 'cause we can't run this asset all year round. So, we're going to save it for those few hours every year, where it's most important to us, because these

assets are -- are -- are so old that it's difficult to replace.

So -- so, he's not incorrect, when he says that, but it changes how you think of the asset, how you use the asset, and how you value the options, as opposed to -- and that's the system focus -- as opposed to an asset focussed would say, look, it's just old, I got to replace it and it doesn't matter what the cost is.

VICE-CHAIR KAPITANY: Okay. So, your deferrals argument would still stand but, then, what -- what I think I hear you saying is there could be some repurposing of assets as well as deferrals?

CONTINUED BY DR. BYRON WILLIAMS:

MR. PETER HELLAND: Yes. As part of deferral would include a re-envisioning or a repurposing of the asset. It would change its role, if you will, in the system.

So, minimum system: invest in the domestic rather than the surplus system and, as has been identified and -- and discussed, probably more than you'd like today, it's -- the current system is not a least-cost system and, for all these reasons, and they -- we believe they add up to far more than 10

percent, but it's all these together that we recommended a 10 percent BOC reduction. Next slide, please.

So, coming to the end, 'cause I'm sure everybody's tired of listening to me. Poor inputs and processes are leading to su -- I'll say less than optimal decisions, maybe 'poor' is too strong a word, but less than optimal decisions. Manitoba Hydro's asset management maturity, they're on a journey and, you know, to be clear, we encourage them to continue the journey.

They've gone from 1.5 to 1.81 since the last GRA. They are weakest in three (3) areas, as identified by AMCL and we -- we -- we concur with that and we strongly encourage, in our evidence, that they -- that Manitoba Hydro focus on those three (3) areas, that those become key to -- to -- to asset manage activities in -- in the coming years.

The electrical system, overall, is transitioning from a period of growth pre-1985 to sustainment. Assets are getting older. Growth rates are lower and you need to separate your domestic from export requirements, once again, that minimum system, and, because of the lower growth rates, it's -- it's challenging to absorb sub-optimal decisions.

They are more expensive for ratepayers. Once upon a time when -- with growth rates of 7.69 percent per year, eh, I missed by a bit. Well, it's no problem. Wait a year. You'll grow into it. Now, the consequences are much more long lived and sit on the backs of the ratepayers because they are, ultimately, responsible for costs for a longer period of time.

What's the consequence of all that? There -- there's an overbuilt domestic system and that's what the evidence tells us and it's not a least-cost system and those are the stated goals. So, next slide, please.

So, recommendations and conclusion, you know, an acknowledgement that -- that Manitoba Hydro's moving from growth to sustainment. There needs to be improved asset information, risk, asset health indices and decision-making processes. Basically, per the AMCL report.

AMCL provides a directive there. We -- we agree with it and encourage Manitoba Hydro to take that very seriously.

Ratepayer desires value for cost matter. There's obviously going to be more conversation about that, but we think that rates

matter quite strongly.

We'll encourage a shift from (sic) a system focus rather than an asset focus as per Manitoba Hydro's Asset Management Policy and... oh, to a system focus. Sorry, did I misspeak? Did I misspeak there, Chris?

Oh, okay. Oh, from, yeah. Shift from an asset focus to a system focus. Sorry, I misspoke apparently.

And then separating domestic versus export needs, quite clearly and quite transparently for the Board so that in the future investment decisions can be evaluated in a transparent and straightforward manner.

And as discussed, ultimately, all this leads to our recommendation of a 10 percent BOC reduction. And, you know, all is not lost. Tools and processes they exist, they are there. They have to be fed appropriately, they can be harnessed, and harnessed to the benefit of ratepayers.

And this is sort of my little inside joke, but sorry about that, hopefully that doesn't offend anybody. Thank you. Any questions? Here's our contact details and -- and that's the conclusion of our presentation, so thank you very much for your

time and attention.

BOARD MEMBER SY: Sorry, I -- thanks for the presentation. Quick question for you.

I'm just trying to understand what is -- why the growth rate is slowing? We move -- moved from 1 percent -- 1.02 percent to 0.33 percent.

What -- what's behind it?

MR. PETER HELLAND: Well, there's several reasons, like -- so, overall North America is maturing electrically, so you know, in the earlier days electricity was -- was new. It was -- so there was huge growth rates, huge -- huge needs for that.

We've matured as a -- as a continent, if you will, as different utilities and jurisdictions. So, your -- your incremental needs are -- are lower. There's also been tech -- technological change. There's a -- I'm sure in your -- your planning proceedings you'll get a -- a long description of all the factors that go into forecasting and planning and how the world has changed.

But the simple answer, as I see it, is we move from a -- a time of rapid growth and electrification and -- and the -- the electrical grids and -- and society has matured as an electricity user.

MR. CHRISTOPHER OAKLEY: Parts of the

country didn't have even electricity. My -- my wife grew up in a town that only got electricity in the '50s. If you had power before that, you had some kind of a generator on -- on board, but they mostly used kerosene lamps and -- and they had wood stoves and -- and that sort of thing.

So, some parts of the -- of the country were at a very rudimentary stage. Obviously, through -- through the last century, we went from the really, really advanced households had a lightbulb, to everyone's got everything and it's all electric pretty well all the way down.

And -- and that -- that has been saturated now. We don't have massive population growth driving all sorts of new loads. Our loads are becoming more efficient. LED light bulbs use a small fraction of what an incandescent uses.

You know, the flat screen TVs use less than the big tube TVS and that sort of thing. So, all -- all these standards are driving to, really, tamping down the per consumer load levels as well.

So, you know, it's -- it's matured. That's not to say that in the future if everyone drives an EV, it won't go the other way at some point, but -- but the technology is out on -- like the --

that decision hasn't been well handed yet, we think. There are going to be lots of hurdles before everyone is driving around in an EV and -- and maybe it's the best not to build that all right now into the system before you see what's going to happen.

THE CHAIRPERSON: Gentlemen, thank you very much. I'm looking forward to tomorrow.

Mr. Williams, did you have something to say? I see you're moseying up to the mic.

MR. BYRON WILLIAMS: I just wanted to close our direct examination and make it clear to the Board that these witnesses are available for cross-examination.

THE CHAIRPERSON: I -- something tells me there may be some cross-examination tomorrow.

MR. BYRON WILLIAMS: I don't expect much.

THE CHAIRPERSON: Okay. Thank you very much. We're going to adjourn now. We'll resume at 9:00 tomorrow morning.

--- Upon adjourning at 4:05 p.m.

Certified Correct,

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Wendy Woodworth, Ms.