ONTARIO ENERGY BOARD

FILE NO.:	**EB-2017-0049**	**Hydro One Networks Inc.**

VOLUME:	**Volume 7**	
DATE:	**June 21, 2018**	
BEFORE:	**Ken Quesnelle**	**Presiding Member and Vice-Chair**
	Lynne Anderson	**Member**
	Emad Elsayed	**Member**

EB-2017-0049

THE ONTARIO ENERGY BOARD

Hydro One Networks Inc.

Application for electricity distribution rates beginning January 1, 2018 until December 31, 2022

Hearing held at 2300 Yonge Street,
25th Floor, Toronto, Ontario,
on Thursday, June 21, 2018,
commencing at 9:32 a.m.

VOLUME 7

BEFORE:

KEN QUESNELLE	Presiding Member and Vice-Chair
LYNNE ANDERSON	Member
EMAD ELSAYED	Member

A P P E A R A N C E S

JAMES SIDLOFSKY	Board Counsel
MARTIN DAVIES KEITH RITCHIE	Board Staff
GORDON NETTLETON GEORGE VEGH SAM ROGERS	Hydro One Networks Inc. (HONI)
LISA (ELISABETH) DeMARCO JONATHAN McGILLIVRAY	Anwaatin Inc., Energy Storage Canada (ESC)
SHELLEY GRICE	Association of Major Power Consumers in Ontario (AMPCO)
MICHAEL BUONAGURO	Balsam Lake Coalition (BLC) Arbourbrook Estates
TOM BRETT	Building Owners and Managers Association, Toronto (BOMA)
EMMA BLANCHARD ERIN DURANT SCOTT POLLOCK	Canadian Manufacturers & Exporters (CME)
JULIE GIRVAN	Consumers' Council of Canada (CCC)
BRADY YAUCH TOM LADANYI	Energy Probe Research Foundation
ROBERT WOON	Ontario Sustainable Energy Association (OSEA)
RICHARD STEPHENSON BODHAN DUMKA	Society of United Professionals
MICHAEL McLEOD	Quinte Manufacturers' Association (QMA)
JAY SHEPHERD MARK RUBENSTEIN	School Energy Coalition (SEC)
RICHARD STEPHENSON	Power Workers' Union (PWU)

A P P E A R A N C E S

BOHDAN DUMKA	Society of United Professionals (SUP)
MARK GARNER BEN SEGEL-BROWN	Vulnerable Energy Consumers' Coalition (VECC)

ALSO PRESENT:

JODY McEACHERN STEVEN VETSIS	Hydro One Networks Inc.

I N D E X O F P R O C E E D I N G S

E X H I B I T S

U N D E R T A K I N G S

Thursday, June 21, 2018

--- On commencing at 9:32 a.m.

MR. QUESNELLE: Mr. Nettleton.

PROCEDURAL MATTERS:

MR. NETTLETON: Good morning, Panel. We have one preliminary matter that concerns a transcript correction that Mr. Jesus would like to make. If we could do that now it would probably be the easiest.

MR. QUESNELLE: Okay. That's Volume 6?

MR. NETTLETON: Volume 6.

Mr. Jesus, if you could turn to pages 186 to 187, I believe you have a correction that you'd like to make there.

MR. JESUS: Yes, I do.

MR. NETTLETON: Go ahead, sir.

MR. JESUS: So on that -- when I was characterizing the level of investment for the wood poles I misspoke and I indicated that it was at asset optimal, which indicates increasing pole condition, where, in fact, the pole -- the level of investment for poles is at intermediate level, which means maintained, so it should be corrected as intermediate, not asset optimal.

MR. QUESNELLE: Okay. Maybe you could bring us to the line. I'm not seeing it -- oh, here it is. Okay.

MR. NETTLETON: I believe it starts at lines 27, page 86, and it goes over to line 6.

MR. QUESNELLE: Yeah, I've got it. Line 26, actually. Asset optimal. Yes. Yes. Thank you.

Okay. If that's all, Mr. Nettleton, Mr. Rubenstein, I presume.

HYDRO ONE NETWORKS INC. - PANEL 5: ASSET MANAGEMENT PLANNING & WORK EXECUTION, RESUMED

Darlene Bradley,

Bruno Jesus,

Lyla Garzouzi,

Brad Bowness; Previously Affirmed

CROSS-EXAMINATION BY MR. RUBENSTEIN: (CONT'D)

MR. RUBENSTEIN: Good morning, panel. I am wondering if we could just quickly start with the response to JT -- sorry, J2.4. This was the Boston Consulting material, and I just want to understand something about what the scope was, and I understand from the undertaking it really consists of two documents. It's the updated undertaking response. One is a detailed presentation on your vegetation management program, and it appears Boston Consulting did some detailed analysis on it, and the second is, I'll characterize it as a high-level presentation to the board of directors on the company as a whole.

Is that your understanding of the material as well?

MR. BOWNESS: Yes, that's correct.

MR. RUBENSTEIN: And is anyone on this panel aware if Boston Consulting did other detailed analysis of any aspect of the company like they did for vegetation management?

MR. BOWNESS: So as a part of our engagement with Boston Consulting Group in late 2015 and early 2016, management had engaged with them to do an overall

assessment and support us in reviewing our company from a cost-effectiveness and efficiency perspective to look for productivity gains that could be incorporated in our business going forward, so as a part of that, Hydro One had identified a number of senior leaders within the company to lead work streams, and the culmination of that was this summary report -- or summary presentation that was made to our board of directors in May of 2016.

MR. RUBENSTEIN: Yeah, so are there similar detailed analysis like is provided with respect to vegetation management for other aspects of the business? Or a subset, let me say, that touch on the distribution side of the business?

MR. BOWNESS: So each of our work streams work through a series of materials and content in order to assess our areas of the business. I was the work stream lead for our capital efficiency work stream under our transmission side of our business, and I had a support team from Boston Consulting that was supporting me in developing an approach as to how we could drive improvements to the capital efficiency work stream. So, yes, there were transactional documents and working documents that we had as a part of our team that culminated in a work stream that I led that was presented up to our board of directors on our path forward on capital efficiency. And similar to that, other team leads, Hydro One leads within the company led similar efforts, with support from the Boston Consulting Group.

MR. RUBENSTEIN: Is there a similar document such as

what the detailed analysis has done for vegetation management for something like distribution planning or asset -- distribution asset management?

MR. BOWNESS: So maybe we could bring up the undertaking, which is J2.4. And if we could maybe move towards -- just get the right reference here. Just one second.

So if we could bring up page 32. So if you see within this document, these are the eight work streams that were summarized within the presentation that had Hydro One leads, leading efforts across our regulatory streams, our asset management streams, capital delivery, as I spoke to, is a stream I led. Customer service procurement, ONA, efficiency, SG&A effectiveness, and labour and outsourcing, so there were working documents that we had within each one of these streams to be able to support the development of the initiatives that are highlighted on the right side of this, so if you look at -- I'm most familiar with capital delivery, because that's the one that I did lead, and you will see that the initiatives that we had that came out of this were around project controls, how we were going to deal with our EPC vendors, our stage D processes, and development of improved KPIs to manage our business, so...

MR. RUBENSTEIN: And those are similar to the presentation which was provided in attachment 1 to the undertaking, the detailed look at vegetation management? Is that...

MR. BOWNESS: I would characterize that we had a

number of working documents within each one of these streams that would be of a similar makeup to the vegetation management work. The way we went about the assessment is we worked together with our members from the Boston Consulting Group on identifying hypotheses and areas of opportunity. We then assessed those areas as to where we thought there could be improvement and developed strategies and initiatives in order to achieve those efficiency gains that culminated in this summary-level presentation to our board of directors on our path forward as an enterprise.

MR. RUBENSTEIN: Can you undertake to file those presentations that deal with the distribution side of the business?

MR. NETTLETON: No, that's not the undertaking that was made, Mr. Rubenstein.

MR. QUESNELLE: No, he's asking now.

MR. RUBENSTEIN: I'm asking you to undertake to file it.

MR. NETTLETON: And I'm objecting to that undertaking, Mr. Chairman.

MR. QUESNELLE: On what grounds?

MR. NETTLETON: This presentation, sir, was and is entitled as a strategic plan that was provided to Hydro One's board of directors. It was provided, as Mr. Bowness has just indicated, as a culmination of work that was done with the assistance of Boston Consulting Group, who assisted management following the transaction of going public, and to find ways of improving the business that

Hydro One's operations entail.

The question is how these working documents, and what line we draw with respect to the working documents that Hydro One is on a day-to-day basis engaging in with respect to the formulation of whatever plans, whether they be strategic or whether they be day-to-day operational plans and how much information of that nature is relevant to a proceeding such as this.

This proceeding is about the application that Hydro One has put forward. It is not about testing the day-to-day affairs, the amount of work, and the interactions that Hydro One has had with its consultants, with its third parties, and the like.

If Hydro One's management were to go off to a conference, put on by a form on work improvement, work efficiencies, and there was a PowerPoint presentation provided in that form, in that conference, it would be loath to think that that type of information is now the subject matter of disclosure and relevance to a proceeding such as this.

This is about testing the evidence that Hydro One is relying on for purposes of the relief that it is seeking.

It's -- this presentation was given in May 2016. It's not even in respect of the time period that this application is now seeking, namely 2018 to 2022.

And there is a more fundamental issue here, Mr. Chairman, and it does require your careful consideration. We have, throughout this application, been requested -- or

requests have been made for draft documents, working papers and the like. And we have consistently said no to those requests of the working papers, of the drafts of the applications, of all of the things that went into building this application.

If the Board is focused on outcomes, if that is the new direction that this Board is taking with respect to focusing on outcomes, then the outcomes that's most important are management's decisions that management has taken with respect to the requests and the evidence that management is relying on for purposes of the five years of rate relief that it is seeking in this application.

MR. QUESNELLE: Mr. Rubenstein?

MR. RUBENSTEIN: I'm not seeking every draft, every communication and every piece of paper between the consultants and Hydro One.

I'm seeking -- my friends have provided an example of a document that I assume sits underneath what was provided to the Board, which was a detailed look -- I assume a finalized detailed look of the vegetation management program. That's the type of document I'm seeking, and it -- I think it actually goes to test the evidence, exactly that purpose.

This Hydro One work with Boston Consulting to do a deep dive into many aspects of their business, this is the first distribution case since this work was done, so I still think it's timely. In fact, you can see this on the screen itself, where it talks about program execution. For

asset management, for example, it's talking about the distribution filing.

I think that sort of work is incredibly important to understanding what they found, and then testing what ended up being the results of this plan.

MR. QUESNELLE: Mr. Nettleton, I think Mr. Rubenstein tried to get at this three or four different ways to ensure that the types -- wanting to know whether or not there was in existence a type of document that was akin to the one on vegetation management. I think he was very careful to ensure that he wasn't looking for the drafts or working papers. Were they -- on these streams, was there a product at the end of those streams that underpins this presentation.

I think to suggest that it's okay to have the vegetation management when there are other reports that are for the same purpose in other areas, but they're off limits because they are too granular. I think Mr. Rubenstein developed an understanding that he's not looking for that; he is looking for the same type of report as a vegetation management.

MR. NETTLETON: Mr. Chairman, to give you an example, where on this slide do you see the term "vegetation management"? It's not one of the streams that are listed.

If you recall, the whole reason why this vegetation management report came onto the record in this proceeding was because it was referenced in the Clear Path, a third-party expert whose evidence Hydro One is relying on. And

the request that was made was to produce that working paper document that the expert used in formulating his evidence that Hydro One is now relying on.

I think the concern now is: Where do we draw the line? And as Mr. Bowness has indicated, the way in which the Boston Consulting Group arrangement took place was not like a third-party report, or third-party expert engagement where Boston Consulting Group was asked to prepare a final report. That's not what happened.

My friend is -- I'm happy to have my friend talk to Mr. Bowness about what the arrangement was. But it's not the same thing as Hydro One going out and asking for Navigant to prepare a benchmarking study and produce a final report.

MR. QUESNELLE: I took Mr. Bowness' evidence, just in response to Mr. Rubenstein, that there were reports on these streams akin to the vegetation.

I recognize the origin of the vegetation is for a different matter, but the comparison was to a report like that.

And if there are -- we're not interested in seeing memos back and forth and the minutes of meetings with Boston Consulting. But if there are reports, I think that Mr. Rubenstein has made the case that that goes exactly -- you know -- the last decision, the last case, this is exactly the type of thing that the Board said was lacking. Therefore we didn't provide the five-year; we provided a three-year and said come back with proof of productivity

improvements.

So I think this is right on point to the type of thing that the Board is interested in, and Mr. Rubenstein wants to go through.

I mean, he was very careful to make sure that there wasn't going to be an onslaught of data that we would then have to draw conclusions as to what it meant.

If there are final reports that underpin these work streams that are of the nature of informing this presentation, then I think that -- that are akin to the vegetation management, the Board is interested in seeing them.

MR. NETTLETON: Sir, I'll do it one last time, I'll make my pitch one last time. But this is not a case of a final report. This is the final report that went to the board of directors, and this is what informed management's decision to ultimately proceed forward with the application that is before you now.

And so the question is if there are intermediary or working drafts of memos or similar documents or similar communications, the Boston Consulting Group has said to Hydro One: Have you considered this? Have you considered that? As part of the exercise of looking at asset management.

MR. QUESNELLE: I don't think we're interested in that, Mr. Nettleton.

MR. NETTLETON: So just to be clear, you are asking for final reports that Boston Consulting...

MR. QUESNELLE: The layer below this presentation. There's a summary page here that identifies the streams. Mr. Bowness took them through them, and I understood his answer to be that there would have been reports that summarized in these activities -- and that's what Mr. Rubenstein is asking for.

If they don't exist, we're not interested. And we are not interested in the creation of a report.

If there is something that underpins these work streams, and I think that's what Mr. Rubenstein was trying to identify, the Board would be interested in seeing them.

DR. ELSAYED: Maybe it is a matter of semantics here. Like when you say final report, I'm not sure what you mean. But the question simply is you have eight elements on this table. Were there reports produced in each of those by the consultant that you have?

MR. BOWNESS: So the process we embarked on was each of the Hydro One team leads worked with the Boston Consulting Group to develop draft materials and presentations that each one of us could be comfortable with what would enter into the final reports, the last presentation that went to the board of directors.

So those detailed working papers, as I would call them, are in the format of a PowerPoint presentation, summarizing those hypotheses and recommendations that we had around driving productivity and efficiency.

This overall exercise, at the time we referred to it is a our "good to great program", recoined as "let's get

great", and it is really the genesis of our productivity commitments that we've incorporated into this proceeding.

If we can pull up -- from a chronology perspective, just to put this in context of timeline, if we could take a moment on that. If we could pull up School Energy Coalition Interrogatory No. 36. Sorry, it's issue -- Exhibit I24, tab 24, SEC 36, you will see the line item that is November to December 2015 right there. You'll see the strategic decision.

So a discussion with board of directors regarding draft business plan, and a decision was made to undertake a detailed review of our organization with several goals, including a review of potential for additional productivity and efficiencies.

That was the triggering point of the engagement that -- we set up these work streams and we engaged with Boston Consulting Group.

Coming out of that was this report that was presented to the board of directors. We then brought in additional materials, such as the finding from the auditor general report, the customer consultation work, the asset strategy, the asset plan and ultimately that formulated our plan that has over $400 million of productivity benefits that are committed in this plan.

So this exercise that our senior management asked us to engage with was the genesis of that, and that was the starting point, and it was to accelerate our thinking as business leaders to really challenge ourselves to drive

improvement. And ultimately, that culminated in our commitment on our $40 million in productivity benefits that we spoke to in the proceeding on Tuesday across the number of different streams.

So I would characterize this as an input into what has ultimately formulated into this overall submission.

DR. ELSAYED: Well, did I understand your answer correctly, that for each one of those you had a PowerPoint presentation?

MR. BOWNESS: There would have been different levels of quality of working-draft documents. I know for the work stream that I led we had a PowerPoint summary on capital delivery and we highlighted --

DR. ELSAYED: On the findings that --

MR. BOWNESS: -- the four improvement streams that flowed into this overall final summary that I was comfortable as a business lead that would be presented by our CEO to the board of directors on our path forward on capital delivery.

DR. ELSAYED: Is that what you would be looking for?

MR. RUBENSTEIN: Yes. I mean, I know we used the term "final report." I mean, I understand consultants, it's all PowerPoint presentations is their final report, but that's -- if those are those documents, and similar to the vegetation management, I think they are directly relevant to this proceeding.

MR. NETTLETON: Sir, I take issue with that suggestion that draft PowerPoint presentations are the same thing as a

final report. Like in the vegetation management, that was an intermediary report that was presented that Hydro One looked at and said, This doesn't work. This isn't good. This isn't consistent with good vegetation management practices; we need to go find an expert like Mr. Tankersley to actually provide us with an informed view about how to do vegetation management. That was very much an intermediary of an input into ultimately what has cumulated into a change in vegetation management.

What I think Mr. Bowness has just explained is that the materials that Boston Consulting Group helped Hydro One prepare in preparation for this report was all intended as an input, as something that would be reviewed and ultimately for the purposes of this report, so it's all draft, it's all subject to a working document that cumulated into this final presentation that was given to the board of directors, and that's my point, is that, respectfully, this is a strategic plan intended for the board of directors of Hydro One. It was reviewed by the board of directors for Hydro One for multiple purposes, including, as listed here, to inform how it was going to proceed forward with this application, with this distribution rates application, as it was then thought of in May of 2016.

My concern is that if we're getting into a case of what all other inputs did you have, that you used to inform yourself to prepare this application, we're changing the focus. We're not focused on what the application is; we're

now focused on: Did you do a good job in the effort that you undertook to prepare this application. And respectfully, I think that goes beyond any of the issues that are on the issues list for this proceeding.

DR. ELSAYED: Maybe just a couple comments. In terms of the Board interest, I understand there is a strategic plan, but certainly the interest is not only in the ultimate product of a strategic plan. Some of the components that went into the strategic plan are of interest to the Board.

Secondly, I didn't take Mr. Bowness' answer to mean that these PowerPoint presentations were draft presentations; is that the case?

MR. BOWNESS: So they were all draft working documents. There wasn't a final report that I, as the business lead for capital delivery, produced and signed off and was a formal document that was submitted for approval.

The document that was the culmination of what would be the closest to a final report would be this presentation that was made to our board of directors of the culmination of those activities, and the actions coming out of that was the development of each one of our work plans that we were going to work on to drive productivity, as well as the input into this filing that formulated the basis of the evidence.

DR. ELSAYED: Who prepared those PowerPoint presentations?

MR. BOWNESS: It was a combined effort, so each team

had a number -- it had a Hydro One lead, we had a Boston Consulting prime, and then we had a number of team members from Hydro One and a number of team members to augment our team from Boston Consulting to pull that -- the materials together.

DR. ELSAYED: And who were the presentations made to? Who were the audience for those presentations?

MR. BOWNESS: So we had established a steering committee that was chaired by our chief executive officer, Mr. Mayo Schmidt, as well as our chief financial officer, which was Mr. Michael Vels at the time, and we had steering committee meetings where each one of the work streams would come in and we would discuss our findings up to that point, and then we would take the excerpts from that and feed that into the overall engagement lead team that pulled the board materials together for presentation to the board.

DR. ELSAYED: So these presentations on the components were made to your senior executives?

MR. BOWNESS: Yes.

DR. ELSAYED: Okay.

MR. BOWNESS: And we as team leads were also members of that steering committee to share and challenge each other in order to make sure that we were getting a good discussion at the steering committee ultimately to be able to pull together a quality document that could be shared with our board of directors.

MR. QUESNELLE: I think that's exactly the type of thing that the Board would be interested in having seen,

Mr. Nettleton. That undertaking to...

MR. SIDLOFSKY: Yeah. That will be Undertaking J7.1.

UNDERTAKING NO. J7.1: TO PROVIDE THE DOCUMENT PREPARED FOR THE BOARD OF DIRECTORS.

MR. RUBENSTEIN: All right, panel. Am I correct that you don't develop business cases for programs, just projects? Do I have that correct?

MS. BRADLEY: On a regular basis we don't create the business case for a program. If there is a change in approach or a change in a program or a new program, at that point we do create a business case, and in Exhibit Q we have provided the business case that went to the board of directors for a change in the vegetation management program. That shows an example of when one is required there is a strategic change in direction, and we do have to go to the board of directors for those specifics in those cases.

MR. RUBENSTEIN: But for programs like pole replacements you are obviously not doing a business case for each pole, correct?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: And so projects which are -- well, I would ask you how you would describe the difference. You do do the business cases for those, correct?

MS. BRADLEY: The programs are something that are, you know, repeatable, high-volume activities, so for our pole replacement program we've done that for a number of years. In our business plan we do talk about the outcomes we're

looking to achieve in that population, but we don't have a specific business case every year; it would be very repetitive and say essentially the same thing. So it is only if there is a strategic change in direction that we would have to update the board with a specific business case.

MR. RUBENSTEIN: And as I understand it, this application obviously has program spending forecasts for the five years, but it also has project spending forecasts for the five years. Correct?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: And my understanding is you don't have business cases for all the projects for the five-year plan, correct?

MS. BRADLEY: Not at this point, no. When we are doing a five-year plan we have, you know -- the specificity we have on the projects in the first year or two are a lot more specific, where we have specific estimates and scopes of work and we know what the investment needs are and have come up with sort of planner estimates for, say, year five, and as we get closer to that date and we need to start executing we would then take it to -- through the approval process.

MR. RUBENSTEIN: And I assume part of the business case that you end up creating for a project is essentially, at a high level, the cost/benefit of doing the activity, correct?

MS. BRADLEY: Yes, it goes through what the need is

and how we're going to solve the need and what the cost will be.

MR. RUBENSTEIN: And so in this application we have projects that you are seeking that make up the capital funding you're seeking approval for where you've not done that cost/benefit, correct?

MS. BRADLEY: We've done, you know, at the high level of what's the investment need and what we believe the solution will be, but we haven't, you know, gone to site and done the detailed, sort of class A estimate.

There could be cases where you look at alternatives and decide to do something slightly different than what you thought today, five years from now. It's part of the change that we expect over the course of our five-year plan, that we are going to get more granular detail over that five years.

MR. RUBENSTEIN: So how can the Board have comfort in the five years with respect to projects if you haven't done the business cases for most of those work?

MS. BRADLEY: I mean, I would suggest to the Board that we've done our needs assessment, so we know the asset condition that needs to be addressed. If you are replacing, say, a transformer at a station, there is a limited number of options to consider, but there are options that we do consider as we get to the specific site and location.

The need isn't going to go away in that five years and the projects that form the vast majority of this

application are -- consist of work that we are very familiar with, so I don't expect a huge deviation over that five years. But the need is still going to be there.

MR. RUBENSTEIN: So at this point, you've done -- it may be a different form, but you've done a high level of cost-benefit?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: So then what's the point of the business case later on? What added value is that at that point?

MS. BRADLEY: By the time we do the business case later in the cycle, we've done an estimate of -- like a more formal estimate. We've done to site to visit and understand more specifics of that location and of the solution.

We might look at alternatives as we are there that -- you know, a different technology may be available, for example, and we have our approval authority registered where that's the time when we take it to senior management or board of directors who have the authority to release those funds to proceed.

MR. BOWNESS: And I think, from an execution perspective, we do see it is a best practices for project work that is not repeatable, to refine the scope and solution and cost as that investment matures, and that point of maturity is the business case.

If a simple example, if, from a five-year horizon we say we are going to do five $5 million projects based on

historical trends and what we have. But if we set the budget at 5 million, we don't believe that's a prudent way to manage that work. We need to be doing the detailed business case on that because some of those projects could should be scoped, and planned, and scheduled to deliver to a scope that cost 4 million -- and some of them will be 6 million, and some of them will be 4.5, and some will be 5.5.

But we really want to have that level of refinement on project work so that we can hold our teams accountable to deliver to the scope and solution that's required to meet that investment need.

MR. RUBENSTEIN: So the costs for those projects at this point for the five years, or are least the outer years of this plan, are rough estimates?

MR. BOWNESS: As you go further out in the future, yes, things are more related to a planner's estimate. The work we're executing now right now in 2018, the start of this period, are in execution. We do have those business cases, we have those projects approved, and my team is executing to those.

A portion of 2019's work is also in execution. But we are working over the process over the next six months to develop the rest of 2019's work program, so we can execute to those updated business cases.

But it's just the maturing of the -- what I would refer to as sort of the assembly line of a project as it moves from a planner's estimate to a detailed scope, to an

engineered solution, to a construction estimate to a business case, and then execute and track any variances and achievements of plans.

MS. BRADLEY: I think, Mr. Rubenstein, to go today to prepare a detailed estimate for work that we plan to do in a five year's time, things can change in those five years. You can have a subdivision develop in an area where you've already gone in to do some environmental work or some customer consultation.

So we try to do the estimate at a time when the steps you take in preparing that; Mr. Bowness' team get easement rights and things like that. So we want to do those closer to when we're going to start the work instead of doing them five years in advance.

MR. RUBENSTEIN: If I could ask you to turn to page 54 of the compendium, I want to make sure I understand the timeline that led to the investment plan.

MS. BRADLEY: Sorry, could you repeat what page you Said?

MR. RUBENSTEIN: Page 34, SEC 36, and this is the helpful summary that you provided, thank you, setting down the material events. And for my purposes, I was wondering if we could flip over to page 55 and start at June 2nd, 2016.

I understand that that was the distribution investment planning process that was initiated for the 2017-'22 business plan, correct?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: And that's the business plan that underlies this application, correct?

MS. BRADLEY: That's correct.

MR. RUBENSTEIN: So and I -- reading down the table, you are conducting -- you begin to conduct your customer engagement in late June -- early summer 2016 is when you're doing the work, or when IPSOS is doing the work for you or with you, correct?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: Then we see in late June 2016, IPSOS provides the initial themes that are shared with asset management leadership; do you see that?

MS. BRADLEY: Yes, I do.

MR. RUBENSTEIN: At that point, what impact is that making on the asset management planning process?

MS. BRADLEY: What impact? When the planners start their work in -- I'm trying to see when the tool opened up -- you'll see in June of 2016, it says "planners input candidate investments into the AIP tool". They input the investments, they input the need, and what the need is on the system. And then they also input what the risks are, and we talked about the business risk factors yesterday.

So when we got the -- get the results, say, in the initial themes, we would look at do we need to adjust those weightings at all, was there something new revealed through that consultation that would result in a change to those weightings. So for the planners, you know, a customer or reliability risk is the same; you know, if there is a

reliability risk, there's a reliability risk.

If after that initial theme was identified or after we received our final report, if we had have found a dramatic change, we could have changed the weightings which would change the output of the tool. But generally speaking for the planners, they are putting in the need, they are putting in the proposed solutions and what those risk factors are.

So the themes help management in their conversation around overall envelope levels, and if there was something new revealed that would make us change the weightings. But for the planners themselves, it would be -- essentially, each project would be the same.

MR. RUBENSTEIN: I thought we understood, I thought the evidence from Tuesday was that the weightings were looked at last in 2015.

MS. BRADLEY: No.

MR. RUBENSTEIN: I'll just give you the reference. I'm looking at Energy Probe 36.

MS. BRADLEY: If you look here -- just one second.

MR. JESUS: Third row, May 27th -- on May 27th, 2016, is when our CEO and CFO reviewed those weightings, in May.

MR. RUBENSTEIN: Okay. But that's still before the customer consultation even began.

MR. JESUS: That's correct.

MR. RUBENSTEIN: When did you -- I don't see anything where you're re-looking at it.

MR. JESUS: So there is no follow up to review the

weightings with the CEO and CFO. It was dependent on the outcome of the customer engagement process that would have led to whether or not we want to change the weightings.

At that time, we would have assessed those weightings and we would have identified whether any changes were required.

And as we know, customer was weighted the highest in the group at 20 points, which reflects largely the results of the customer engagement process.

MR. RUBENSTEIN: So did you actually consider the customer engagement at this point, I guess when the initial themes were decided and reconsidered changing the weighting and decided that you didn't have to? Did that actually occur?

MS. BRADLEY: At the initial stage on May 27th, 2016, we didn't have those results. We have a lot of other mechanisms to know, you know, where our customers are at with respect to their needs and preferences. I believe the customer panel talked about a number of different forums and formats in which we consulted with our customers.

So we did have some idea of customer and the rate pressures that customers were feeling at that point in time. When we got the actual results back, I think if you look through the board memos that are submitted in, I believe it's SEC 8 --

MR. RUBENSTEIN: No, no, I understand that.

MS. BRADLEY: So there is a lot of awareness. So when we were talking about what's the overall envelope, for sure

we had those results. If there was a need to change weightings, we would have. But we didn't have a formal line in here where we said we're going to go line by line through and reassess every one of them. That wasn't done after that survey. But we had awareness going in and we used the results when we reviewed that final plan to set the overall envelope and talk about what plan makes sense, given that feedback.

MR. RUBENSTEIN: I understand that. But my question was specific to the line in late June 2016, where initial themes through customer engagement were shared with the asset management leadership.

My question was at that point, because I read it that the planners are already putting their candidate projects into the system, maybe have completed it by that point.

When you got those initial themes --

MS. BRADLEY: Yes.

MR. RUBENSTEIN: -- what thought process happened and what did you do with that information?

MS. BRADLEY: So at this point in the process, if you go down two lines to investment calibration, during investment calibration, that's where a number of organizations -- parts of the organization get together to talk about how have people input the risk and is everyone treating risk the same way. So the initial themes that were identified would be reflected in those conversations and those meetings that were held where we talk about projects that have been weighted and assessed, and that's

to make sure that somebody doing an investment on IT or on customer or on the power system are all treating those risk factors the same way and using the information from those initial themes, so it would be used there.

We've got also the prioritization and risk optimization of candidate investments, so if we had decided to change a weighting, for example, through that process, from a conversation on the themes, through the calibration, we would have changed before that early to mid-August time frame when the actual prioritization and optimization takes place, so those steps took place after the IPSOS report.

MR. RUBENSTEIN: You say "we would have". My question is -- I understand you didn't, but did you -- was it an active thought process at that time when you were actually going through this?

MS. BRADLEY: Yes, it is.

MR. RUBENSTEIN: It was.

MS. BRADLEY: It was.

MR. RUBENSTEIN: Okay, and so the final engagement report comes in mid-August 2016, correct? I think August 18th is the date?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: But in early to mid-August you are doing the prioritization and the risk optimization, correct?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: So this actually comes in after you do that work?

MS. BRADLEY: The final report.

MR. RUBENSTEIN: Yes.

MS. BRADLEY: Yes.

MR. RUBENSTEIN: So it has no impact on the prioritization and risk optimization.

MS. BRADLEY: I don't agree with that. We had initial themes identified. We had the draft report, so we did have information that was used in that prioritization.

MR. JESUS: So just to be clear, the optimization -- just to be clear, the optimization was carried out at the end of August.

MR. RUBENSTEIN: Well, it says early to mid-August on your --

MR. JESUS: It was actually carried out at the end of August, and then we carried out the engagement, so we did have -- there was time in between if planners wanted to go in and input additional details between the time, so we had early themes back in June, late June, if you will, which were being shared with the planners. There were ongoing face-to-face meetings with the planners. There was a risk calibration meeting on July the 12th where the entire enterprise got together and we presented materials that the customer engagement would have been discussed, and then we pushed the button or we did the optimization at the end of August. So up until the end of August there was plenty of time to enter any additional investments that would have come out of the customer consultation.

The only other thing I will add is that the plan was

still not approved. This is an iterative process. And that the plan was then only approved in December. So from August to December a lot of things are still happening.

MR. RUBENSTEIN: So just to be clear, where you said the optimization took place at the end of August, is that -- is it wrong on this table? Because it says early to mid-August.

MR. JESUS: Early to mid-August, I stand corrected.

MR. RUBENSTEIN: Okay.

MR. JESUS: Yes.

MR. RUBENSTEIN: But then that goes back to my point: If the customer consultation is August 18th, which is mid or mid/late August, however you want to characterize it, so it seems to me that's after you've done the risk.

MR. JESUS: But that was the final report. That was the final report that was leveraged that was delivered. Prior to that we already had the themes that cost was number one, reliability was number two. We -- affordability was an issue, power quality was a big theme with the large industrials, and for the CNI customers as well. Those themes were already resounding in the early themes that were presented to us.

MR. RUBENSTEIN: All right. So -- and then as I understand the draft investment plan is created in September and it goes to the board in October with the Plan A and B, correct?

MS. BRADLEY: That's correct.

MR. RUBENSTEIN: And -- well, we understood from the

first panel, and I think you referenced this earlier, that management proposed Plan A and the board essentially said no, go back and take a hard look at the cost element. Do I have that correct?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: So that's a point in time where we see from the presentations there was summaries of what the customer engagement -- the board is looking at that and making an assessment that costs are -- the proposal that management has provided is too costly, correct?

MS. BRADLEY: This is the section here when you talk about the final customer engagement report. The iterations back and forth between the CEO and CFO and the board of directors back to the planning team was really about saying, This is the result of our customer engagement session, and we kept working through that prioritization process to come up with a plan that we believed met our requirements, to be responsible stewards of the assets, met our customer needs and preferences, and had an acceptable rate impact.

MR. RUBENSTEIN: But your initial recommendation, management submission recommendation to the board didn't agree with, sent it back.

MS. BRADLEY: Yes.

MR. RUBENSTEIN: I want to go back to June 2016 just to get a better sense of, when we were talking about the planners inputting the investments into the AIP tool.

I would assume that the planners had been working on

the investments for some time before they could put them in the system, correct?

MS. BRADLEY: Yes.

MR. RUBENSTEIN: How long? What is the time frame when they're working on the investments that go into that tool? What is the time frame we're looking at?

MR. JESUS: So the tool would have opened up -- so the tool would have opened up in June, as identified there, and the tool would have effectively have closed in -- at the end of September, because we were doing -- we were doing engagements with the enterprise, so we had the -- in mid-August we had the final, final report, which there would have been plenty of reports up until that point of time in draft themes, and then we did the engagement with the enterprise, making sure that we can actually execute the work, so changes were still happening inside the tool, or inside the system, and the final investment plan that went up was in October.

MR. RUBENSTEIN: That's not my question. My question is, obviously -- I would assume before the tool opens planners had been working on for some time all the various projects and candidates, they'd been looking at them, looking at the data, determining their needs, and my question is: What's the period of time before the tool opens that they're working on this?

MS. GARZOUZI: I would say that we work on plans all the time. It is alive all the time. We are constantly assessing areas, we are constantly monitoring the system.

We are constantly, you know, verifying reliability, condition, you know, needs for growth and so on and so forth, so I would say it's iterative and it is continuous. There isn't an open and a closed from a planner's perspective. It is something that we constantly do. That's what a planner does, is they oversee an area and they monitor that area.

MR. RUBENSTEIN: I recognize that there is no definite day, but I'm just trying to get a sense, are we talking about a year, six months, two years?

MS. GARZOUZI: It's continuous.

MR. JESUS: Continuous.

MS. GARZOUZI: It's really -- if you look at how planners are set up, so depending on the assets and the types, a development planner would be looking at a geographic area, so circuits within an area, and they would be assessing needs from an asset perspective, from a sustainment perspective.

We have some planners that are monitoring certain asset classes, transformers, wood poles, rights-of-ways, and that's what they do all the time.

MR. RUBENSTEIN: So it would be fair to say, I would imagine then, if you were a planner who is looking at a -- transformers, you'd be looking at the transformers and making determinations for whatever investment you end up putting in the system for, obviously more than a week before it opens up, you know, a year and more. You'd be looking at it and assessing what the needs are and so on.

MS. BRADLEY: This is -- it's like it is an iterative process. This is work we do in planning, and the annual -- every year we do an investment planning process that takes a snapshot in time for that year of what do the next five years look like.

MR. RUBENSTEIN: So if we go back, further back to page 54, and we see in December 2015 we get the -- you get the auditor general report, correct?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: And it's fair to say that the auditor general had critical comments with respect to your asset analytics data?

MS. BRADLEY: They raised concerns that they had when they looked at that data, yes.

MR. RUBENSTEIN: If we turn to page 57, this is from your evidence. This is an internal audit report that you created. Not you, Hydro One's internal audit team put together, to follow up on the auditor general's report, correct?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: And it's dated -- final report was issued on March 31st. Do I have that right? With a draft report on November 25, 2016?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: Why did it take more than four months from the issuance of the draft report until it was finalized?

MS. BRADLEY: I'm not sure.

MR. RUBENSTEIN: And am I correct that March 31st, 2017, was around the time when you filed the application?

MS. BRADLEY: Yes.

MR. RUBENSTEIN: And if we flip to page 63 of the auditor general's report -- sorry, my apologies.

MS. BRADLEY: Page 63 of your compendium?

MR. RUBENSTEIN: Page 62 of my compendium. I apologize, the number was wrong.

And this is under the heading "AG recommendation 5: Information systems on asset condition including asset analytics"; do you see that?

MS. BRADLEY: I do.

MR. RUBENSTEIN: Then underneath that in that box, you are summarizing your understanding of the findings, correct?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: And your you're summarizing the auditor general, and you say -- this is what your interpretation of the report was:

> "Enhanced its asset analytic system to include information on all key factors that affect asset investment decisions, including those to relate to technological/manufacturer obsolescence, known defects, environmental impacts and health and safety. Review and adjust current weightings assigned to risk factors in asset analytics to more accurately reflect their impact on asset condition and risk failure. Make changes to its

asset analytics system and procedures so that updates in its data are complete in a timely manner.

"Conduct a comprehensive review of the data quality in asset analytics to update any incomplete or erroneous information on its assets, and to ensure that the information can support its asset replacement decision-making process, and investigate why defects in the reliability of the asset analytics system, such as those found two years earlier by internal audit, have not been corrected by management in a timely manner."

Do you see that?

MS. BRADLEY: I do.

MR. RUBENSTEIN: And by the time this report comes out, you've partially completed that, correct?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: And the assessment on the controls is it's partially effective, correct?

MS. BRADLEY: That's correct. The -- we could go through each of these, but if I look at asset analytics as an example...

MR. RUBENSTEIN: We are going to get through some of them, so let me ask my questions and then we can -- I will let you –-

MS. BRADLEY: I think you asked about the things being partially effective. So I'd like to...

MR. RUBENSTEIN: I'm just saying that was a finding.

MS. BRADLEY: Sorry?

MR. RUBENSTEIN: The finding was partially effective, I'm reading here.

MS. BRADLEY: The finding was partially effective because if you look at things like their recommendation on the asset analytics tool, it talks about including other factors such as technological and manufacturer obsolescence, known defects and environmental impacts and health and safety.

So those risk factors aren't incorporated into the asset analytics tool. That doesn't mean we don't use those risk factors. So we have all the information; it is not incorporated into the asset analytics tool. So planners get the other risk factors out of the tool that are all put into their algorithms, and then we know if there is obsolete equipment, it is outside of that tool. They know where there's health and safety risks; it's outside of that tool. So that's an example of where partially effective is saying yes, we understand that you factor those factors into your decision-making process, but it is not incorporated into the tool as was suggested by the auditor general.

It doesn't mean we're not factoring them in; it doesn't mean they are not a consideration in decision-making. But it didn't address -- the auditor's general's recommendation was incorporate them into the tool. There is a cost process, a number of impacts on that, so that we

have to decide when the right time is for that type of investment.

MR. RUBENSTEIN: Let's look at -- and I take it that the box on the left side is essentially, at this point, what you have done, correct, and the issues that summarize why you're partially complete and partially effective, correct?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: And so the second bullet point says:

> "Recent data remediation efforts were primarily focused on transmission data due to the timing of the transmission rate filing, but did not adequately address distribution data integrity issues. The company's plan to develop long-term sustainable approaches to management of data quality and completeness should, upon completion, help mitigate the risks of continuing data integrity issues."

Do you see that?

MS. BRADLEY: Can you answer? You've got more...

MR. RUBENSTEIN: So at least at the time of this internal audit report at the end of March 2017, you had not done all the work on the distribution data, just the transmission data, correct?

MR. JESUS: That's not correct. So let me take you and hopefully it's more helpful than what's shown here. From an asset condition data perspective, we have all the asset condition data. We have all the asset condition data

on all of our poles. We have all of the asset condition data on all of our stations.

The issue that was being addressed here was really about some of the supporting factors that help determine the priority. That's really what they were focused in on. So from a decision-making process, the data that we need to identify the pole, the bad poles, the bad stations, we've got all that data. It is in AA. Planners are using that data.

What -- if the data is not there they can go to the source system. For example, performance is in ORMS; it is coming through in asset analytics. So all the data that we are referring to is really from a -- asset data was complete.

What this internal audit was getting at was more around the operational data. So from a distribution management system at the operating centre, that have to make sure that the GIS system, the graphical information system, is integrated with that operation centre. Those systems are not totally aligned and we're still dealing with those issues from an operating point of view, not from a planning point of view.

So the discrepancies that we're talking about here are really about operational data, not the condition data.

And from a -- the data's there. In terms of how we use that data to make our decisions, Lyla can take you through how we use that data. But all the data is all there.

MR. RUBENSTEIN: If we go to AG recommendation 6, do you see that, the next one? Your interpretation of the auditor general, as I read it, is:

> "Hydro One should ensure that applications to the Ontario Energy Board for rate increases include accurate assessment of the condition of its assets."

Do you see that?

MR. JESUS: I do.

MR. RUBENSTEIN: And then you have substantially completed that by the time this report is completed, correct?

MR. JESUS: So we we're referring to in this report, in terms of both transmission and distribution, for distribution there's no issue with data. That's how I would categorize it.

From a data and from a condition point of view, the need is in existence. We know that there's 106,000 poor poles on the system. We know that there is 155 poor stations on the system.

MR. RUBENSTEIN: So when you're summarizing what you'd done, you say:

> "Management focused its efforts on remediating data completeness issues and transmission data at the time of the audits."

MR. JESUS: Maybe I can take you to address the completeness issue. If I can take you to JT3.1-11, to put this in perspective on how much data we have complete. So

JT3.1-11 -- no, that's the wrong one. It is 3.1 -- I think it's 3.01 and then it goes to .011. It is really -- there we go.

So if you look at the table below, which talks to -- so we have a scoreboard of all of the data that we've got on the distribution side. And you can see from a data availability on our station structures, we have 100 percent complete data. From MUS structures, we have 100 percent complete data on the fleet of MUSs.

Circuit breakers, they're 38 percent. Yes, when we get to those circuit breakers, we have about 138 circuit breakers. In the grand scheme of things, it's not a bog deal. We recognize that there is a lot of obsolescence, as Darlene mentioned, that we are dealing outside the system.

For lines and station transformers, the data numbers are there. They are close to 90 percent and I would advocate that they are 100 percent.

If the data isn't there would suggest that we would perhaps need even more work to be done. But the line -- the lines data is also identified at the bottom there that says it's 100 percent. You have to understand that when we collect data on our lines, it is by exception, as what was mentioned by Lyla.

So every time a technician goes out to patrol the line, he is collecting data on all of the poles and he is determining whether that pole is in poor condition. And if there is a defect, he would collect that data and log it into the system. It is 100 percent.

MS. GARZOUZI: If I may, maybe just to contextualize this. So we talked about asset analytics versus having information to make decisions.

From a planners' perspective, we have more data than we've ever had before. These findings, whether they be AG or internal audit, are more about effectiveness of the use of the data and aggregating it into one screen, right, so rather than going to six sources to get the data, are you able to roll it up into one tool to have it at the click of a button for a planner. That is the criticism that you are reading about.

If we look at this plan that we have in front of you, largely based on replacing wood poles, and so the condition for wood poles is all in our enterprise system, it's in SAP, and that feeds into asset analytics.

In addition, we have our stations, so our transformer replacement or our station replacement, which is all captured into our enterprise system. That's also feeding into asset analytics. So those risk factors are working well. It is the other ones that we will work on from a continuous improvement perspective.

MR. RUBENSTEIN: If we can turn to page 65 of the compendium. This is recommendation 11. It's called "quality of data for distribution assets". And I'm reading what Hydro One's takeaway from the auditor general's report was:

> "Ensure that management decisions on replacing distribution system assets are made using

reliable and complete information. Hydro One should take actions needed to ensure its asset analytics system provides timely, reliable, accurate, and complete information on the condition of assets."

Do you see that?

MS. GARZOUZI: Yes.

MR. RUBENSTEIN: And do you see the commentary about why what you've done -- second bullet point says:

"Although recent data remediation efforts achieved success in reducing the number of data points that were found to be missing or incomplete, the focus has been on transmission data (to support the more immediate needs of the transmission rate filing). This effort had not yet been addressed for the data quality of distribution data at the time of the follow-up."

Do you see that?

MS. GARZOUZI: I do. And I think it's important to separate asset strategy, data, and then reliability reporting, so if our asset strategy is to inspect something and test something, that data is largely complete. So let's look at wood poles and transformers as an example, or reclosers, but if we look at, let's say, pole top transformers, right -- and we talked about that yesterday -- we don't maintain pole top transformers, and so we wouldn't have condition assessment data on pole top transformers, because we're not performing maintenance

activities on pole top transformers. They are run to failure, and so this comment is about that. It's about getting information on all components of the distribution system. However, on the assets that have a strategy which is to perform testing and maintenance activities, and large capital plans, those are largely complete, and those are being collected and captured accurately.

MR. RUBENSTEIN: So do you see on the right-hand column it says -- under A it says -- I think this is what you need to still do -- it says "complete task 42 as committed by management"; do you see that?

MS. GARZOUZI: I do see that.

MR. RUBENSTEIN: All right. Well, if we -- let's turn to page 69 of the compendium, where it explains what these are. And I read task number 42 to say:

> "Following the remediation of the TX data planning will enable a project to focus on distribution data. However, due to resource constraints, both of these initiatives are not able to be implement simultaneously within the business."

Do you see that?

MS. GARZOUZI: I do see that.

MR. RUBENSTEIN: So I take it that what's left is, by March, the end of March 2017, you need to work on the distribution data. That's sort of the takeaway I'm getting from this and some of the other areas. You focused on transmission first, and then you're moving to distribution;

is that fair?

MS. GARZOUZI: Okay, it is fair, but I think it's important to understand what the context of this is. The context here is data that allows you to operate the distribution system. If we contrast the distribution system with the transmission system, the transmission system is largely automated, largely monitored, and almost every component is maintained.

On the distribution system it's not that way. It is a radial system. Some components are run to failure, and largely, it is not operated the same way the distribution -- the transmission system is operated.

What I mean by that is it's not a smart system, and so the importance and the latency and the updated data is very important if you are operating a smart grid, for example, but in the case where you are maintaining your assets and you're managing it from a condition perspective, that data, again, is up-to-date and captured, so I think we want to distinguish condition-based maintenance to data that helps you operate your system in real-time or near real-time. So this finding is about operating the distribution system.

MR. QUESNELLE: Ms. Garzouzi, why would planning enable the project then if it's an operations concern?

MS. GARZOUZI: It is an -- operating from a -- we would say that there is a need because our strategy is to make the distribution grid smart, essentially, so we are transitioning from largely a system that is not monitored or controlled to a system that will be monitored and

controlled, so our only --

MR. QUESNELLE: And that's a planning function --

MS. GARZOUZI: Correct. So we're --

MR. QUESNELLE: -- as all of the system --

MS. GARZOUZI: Exactly, and so our only area right now that is smart is the Owen Sound area. The rest of the province is not, and our strategy now is to update devices with smart devices, and so we are doing that from a station perspective and also from alliance perspective. To support that enablement we need more accurate and real-time data so that it can be controlled, and that aligns with our DMS and our centralized control strategy, long-term.

MR. RUBENSTEIN: Could I ask you to turn to page 123 of the compendium. This is an internal audit report titled "investment planning follow-up", and it is dated September 6th, 2017. Do you see that?

MR. JESUS: Yes, I do.

MR. RUBENSTEIN: So this would be about six months after the internal audit report on the auditor general, correct?

MR. JESUS: Yes, that's correct.

MR. RUBENSTEIN: And I understand the purpose of this report was to follow up, I guess, on an earlier report from 2015 on investment planning; is that correct?

MR. JESUS: That's correct.

MR. RUBENSTEIN: And if we flip to page 124, we have a table, where it sets out, I guess, things it found -- different items it found in 2015 and the risk level and

then what the risk level is at the time of this report; is that correct? Do I see -- am I reading that correctly?

MR. JESUS: That is correct.

MR. RUBENSTEIN: And so for item 2.3 I see asset analytics data at risk high in 2015; do I have that correct?

MR. JESUS: That's correct.

MR. RUBENSTEIN: And in 2017, this report, still high?

MR. JESUS: And again, it's high because of the reasons that we just explained, so the asset analytics data, yes, we recognize that we want to bring all the data. We want to correct the algorithms from a -- mainly from a transmission point of view, and we have a governance project in place, so it was really mainly geared towards a transmission business from a data perspective.

MR. RUBENSTEIN: All right, and if we flip to page 2, on page 125 of -- do you see under "summary of key recommendations"?

MR. JESUS: Yes.

MR. RUBENSTEIN: Reading "high risk", it says:

> "Continue to identify and correct issues with asset analytics input data and risk-factor algorithms that will affect the degree to which output results can be used to influence investment decisions."

Do you see that?

MR. JESUS: I do.

MR. RUBENSTEIN: And then if we flip to the next page,

where we see the audit opinion, it says:

> "Management has made significant progress in addressing the control deficiencies that we have identified and documented within the 2015 audit. However, further progress is needed. Based on the specific areas reviewed, we conclude that control improvements are needed to effectively identify, develop, prioritize, and select investment plans in support of Hydro One's six-year business plan and work program."

Do you see that?

MR. JESUS: I do.

MR. RUBENSTEIN: And if we flip to page 130, this is the -- some more detail on issue 1.4 asset analytics. Do you see under "risk"? What internal audit is saying is:

> "The absence of a well-understood and quality asset information increases the risk of inadequate asset need assessment, which can result in diminishing confidence in the process involving the asset -- the AA tool and the potential for less than optimal investment decisions."

Do you see that?

MR. JESUS: I do.

MR. RUBENSTEIN: So the auditor general finds data issues regarding your asset condition, and it's not remedied when you develop the investment plan. Your internal audit put the risk level at high, and even after

you filed the application the internal audit says that it's still high.

How can the Board have faith in the investment plan that you are putting out here if the underlying data there is significant problems?

MS. BRADLEY: The one thing I would highlight is if you look at the observations, they do talk about the fact that plans are underway to address 78 requirements related to two new risk factors, and then 159 requirements related to enhanced risk factors.

It's saying these are the things that the two new risk factors are the risk factors we were saying we do; we just don't do them in that tool. So it's the same aspect that Lyla, Ms. Garzouzi, was mentioning around having data, and having to go to six screens instead of one screen to get that output.

This is a continuous journey. We have more data than we've had before. It is optimizing how we get that through a tool.

And the other point I would make -- and I actually don't believe this is true. But if there was data missing, what that would mean is we don't have visibility to something in poor condition, which would mean it's not in the plan. So the risk that we would have is that when it talks a less than optimal investment decision, that would mean we didn't pick up something that needed to be replaced and it failed.

It wouldn't mean we put something into the plan for

which we had no data. So it doesn't suggest that we would have an over-inflated investment plan. If anything, if there was missing data, we wouldn't have things in there.

But these are factors that people look at separately and bring together with their engineering expertise and judgment. To bring together four or five factors, we used to have to do them all outside of the tool. But we were still aware of the data and the sources. They are just not brought together.

MR. RUBENSTEIN: I'm not sure it necessarily means that you would be -- it would mean you would be saying you'd need to spend more money. But how do we know that the work that you are planning to do, the assets you are specifically planning to replace are the right ones that you're going to replace and you're not replacing an asset that you shouldn't be replacing?

MS. GARZOUZI: Because we are making our decisions based on conditional data, which is largely complete, and reliability data that we have.

I'm going to point to you to I35, BOMA 31C. So essentially -- oh, she's not there yet.

BOMA 31C; it's a long one. You don't have to read it right now, but it's maybe nice bedtime reading. This one, if I'm to summarize it quickly, is really there's three big elements. The age of our system is, you know, older than our peers and every year, everything ages by a year.

Specifically for wood poles, if you look at figure 1, the current replacement rate assumes that our wood poles

would have an expected service life of 72, which is ten years older than what we're operating with already today and we are already about ten years older than our peers.

That's data that we have; we have it on the 1.6 million poles, and that's benchmarked against our peers.

The next table, figure 2 shows you our assets in poor condition. Here we just simplified; we showed for stations, but we have the same data for wood poles. Our plan that we're proposing to you maintains the condition of our fleet. We currently have 106,000 wood poles that are in poor condition based on our testing and our inspections.

We have about 70 stations that are in poor condition, and so this plan addresses those. And lastly, it's the reliability piece. So we do have reliability reporting on all of our 3,300 circuits, and we looked at two views here. We looked at customers experiencing long interruptions, so over 15 hours, and customer experiencing multiple interruptions. Those can be found at figure 3 and figure 4. And so we have a lot of customers -- oh, 34,000 customers are experiencing 15 hours and so on. So you see the bar chart.

And so that -- if you continue on also, so on figure 5, you see Hydro One's reliability relative to our peers. We are a rural utility. We are benchmarking ourselves here, but we see that our reliability is worse than our peers and we don't like that. We want to do better. We are seeking to improve that in the current plan

that is filed and we are doing that, not by demanding more money, but by trying to do things differently.

And so how can the Board be sure that, you know, we have the information we need? It is true we don't have every single data point on every single asset, but we have a lot of data that is informing our plan and I believe that it is an informed plan with high quality data.

MR. RUBENSTEIN: How can the Board be sure that the plan, the projects -- the specific assets that you are going to replace are going to be the ones that you should replace? Understanding you may -- you are not replacing an asset early or you're -- because the data that underlies your asset analytics program has not been repaired?

MS. GARZOUZI: Because -- so let's look at wood poles. It is our largest capital planned program.

So we have 106 wood poles that are -- 106,000 wood poles that are in poor condition. Over the plan, we are seeking to replace 72,152 wood poles, so we are not doing them all. Every year when we do testing, we find more. We find, on average 9,000. So we are actually maintaining the population.

So how do we know we're doing the best ones? Good question. What we do is we look at our systems, we look at where these poles are. Do they have multiple circuits, do they have joint use attachments. Are they in close proximity to school and public and so on and so forth, and we prioritize from those.

So we use the condition information that's informed

our plan. We use reliability information and reliability risk information, and we look at their location, and that's how we select from within the list that we have.

MR. RUBENSTEIN: What about the poles did you in the plan? Can we have the same confidence that you did the right poles in the past three years based on the issues with your asset analytics?

MR. BOWNESS: I think there's one thing that's really important to understand in the context of the asset analytics solution. It's a business intelligence layer on top of our SAP system.

We've been embarking on a journey over the last 12 years of moving away from disparate Excel sheet, disparate systems, to consolidating on enterprise class systems with our SAP and GIS applications as our main foundation, overlaying that with a business intelligence layer, and driving improved analytics and algorithms using that big data to make ever improving business decisions.

But underlying this is a team of planners that have expertise, that live and breathe this work day-in/day out and historically were using disparate systems are now using enterprise class systems are now using ever-improving enterprise class systems to make better and better-informed decisions.

So if you look at the context of how we've been making investment decisions over time, we've been using legacy processes. We are now using new processes enabled with improved technology and every year, we are making better

and better informed decisions.

That doesn't question the decisions we've made up to this point. They have been made with really smart, strong engineers using the systems that were in place at the time. And now we're leveraging those smart engineers to make even better decisions going forward.

MR. RUBENSTEIN: Can we turn to page 88 of the compendium? This is a transcript from 2013-0416. This is the issues day which is really, as I recall, what we now call the presentation, the executive presentation day.

If we can turn that -- turn over to page 93. And speaking was Mr. Sandy Struthers, who I believe was the chief CEO, or chief administrative officer at the time. Is that correct?

MR. BOWNESS: Yes, it's Mr. Sandy Struthers.

MR. RUBENSTEIN: At line 6, he says:

> "To ensure that we are spending money in the right area, we have made investment to provide with full visibility to our assets their condition and our work programs. Tools such as asset analytics are allowing us to make targeted investments to minimize the impact of costs to customers and to provide us with an effective way to manage programs and investments."

Do you see that?

MR. BOWNESS: Yes.

MR. RUBENSTEIN: And if we flip over to page 98 of the compendium, and I believe this is Mr. Wayne Smith talking.

I believe he was your senior vice president of engineering and construction at the time. Do I have that right?

MR. BOWNESS: He was in a variety of roles around that time. But yes, that would be operational domain, yes.

MR. RUBENSTEIN: We talked about wood poles and at line 19, he says:

> "The wood pole program is a program that is very much a long-term program, where we have an aging fleet of assets and we need to basically have a sustainable plan to replace those assets in a way that does not push a cost off into the future years that is not achievable.
>
> "So we really want to start ramping up the program, which we started this past year, to a level that minimally meets the long-term needs of the aging asset base. Driving this program is the intelligence we have in programs like asset analytics, a portion-by-portion analysis of the province, knowing the age of our fleet, of the wood poles, knowing where the risk is, and knowing where we want to focus getting on those poles created (sic)."

Do you see that?

MS. GARZOUZI: Yes.

MR. RUBENSTEIN: So is Hydro One -- can Hydro One say with certainty that over the last three years not a single asset was improperly replaced due to the issues with your asset analytics data?

MR. BOWNESS: So if I -- I'd like to take you through the life cycle of a pole replacement.

MR. RUBENSTEIN: First, can you answer my question --

MR. BOWNESS: Yeah --

MR. RUBENSTEIN: -- and then you can say your context --

MR. BOWNESS: There is -- there is a potential that a pole could have been replaced at a suboptimal level. It could have been a year or two early. So when you get so precise with your question, that's what I'm struggling with, but if you look at what we're trying to do, is we're managing a fleet of 1.6 million poles across the province. We're looking to identify the poorest-condition poles, the ones that have the biggest impacts on reliability and asset health. The planners are using data and analytics to come up with a work program of approximately 10- to 12,000 poles that need to be replaced.

We have centralized that decision-making with asset planning, so one of the findings coming out of the Navigant study was to centralize that decision-making, so we do that centrally so that can we can optimize what are the 10- to 12,000 poles that need to be executed.

But as that transitions over to my group to execute, we end up getting out in the field to do the actual fieldwork, and there's times where we would go out to a pole that is in the 10,000 poles to be replaced, and it will be brand-new, and you might question, well, why? Well, so what we have is we have storm and trouble that

rolls through our territory. We do the work as efficiently and as effectively as we can during a storm, but the data capture processes that we have during a storm are not as robust as they are on a planned basis, so our field groups at the time would mark that item as not being required to be completed, and they would move on to the next work activity in the step, so we have a field control point on making sure that we're not replacing poles that are new.

But to get to your question of, can I say to a definitive point that every single pole is the perfect pole to replace, that's not a question I can concretely or definitively answer.

MR. RUBENSTEIN: My question was broader than just poles. Can Hydro One tell us with any certainty that because of the issues with your asset analytics program you did not -- let me rephrase: Can you tell me with any certainty that the issues with the asset analytics program do not have any impact on the assets that you have replaced in the past three years?

MR. BOWNESS: So I can confidently --

MR. NETTLETON: Mr. Chairman, Mr. Chairman, I think to contextualize the question that Mr. Rubenstein has asked, it's got to be placed in respect of the particular asset so that the issues of the analytics tool, as he's referred to, are placed in context with the particular asset.

Mr. Bowness just explained his response with respect to wood poles. If Mr. Rubenstein wants to go through this exercise with all other assets, I think we have to first

establish what the issues were in respect of the asset analytics tool, let the witnesses speak to that, and then put it in the context of that particular asset.

MR. RUBENSTEIN: Well, we could --

MR. QUESNELLE: I think the flip of that would probably be more efficient, Mr. Nettleton. If Mr. Bowness knows of a particular asset that needs a special treatment, then he will know it. I don't think Mr. Rubenstein has to find it in the stack.

MR. NETTLETON: Right. No, my concern is that Mr. Rubenstein keeps referring to the issues associated with the asset analytics tool and then says generically, with certainty, can you make sure that there are -- that all assets have been managed appropriately.

And if we are going down the path of looking at this from each individual type of asset, then I think it's only fair to put the context of his phraseology of issues with asset analytics tool in that context.

MR. QUESNELLE: I think if Mr. Bowness knows of any assets that are directly related to the issues that were raised in the tool, I think he can identify those.

MR. BOWNESS: So I'm not aware of any assets that we were replacing that have an issue that is -- stem from a problem with asset analytics data. The data that we have within the asset analytics tool from a distribution perspective with respect to the condition of the assets has a high level of accuracy, which is leading to informed business decisions that are resulting in the proper assets

being replaced in the field.

MR. QUESNELLE: Mr. Bowness, we've got the auditor general report audit, and we've got a follow-on audit, which was an internal -- another follow-on audit, internal audit again.

Now, typically in an audit scenario management would have comments -- preliminary comments in response to any of the finding in those audits.

Was anything that's been discussed here this morning responded to these findings in the audits by management at the time of the -- that the audits were first presented? Isn't there an iterative process there where the audit findings would be presented and management would respond to those? Any of the comments that we're hearing this morning found in any of those responses?

MS. BRADLEY: The one thing I think is potentially a risk with having internal audit reports used in this form is, I look at these reports and this process as very much a support mechanism for driving continuous improvement in our business.

So we definitely agree that data -- there's more and more data available at a lower and lower cost as we move to things like, move to mobile, so we agree that, for example, with the pole scenario, if I didn't have GIS data in the tool, it wouldn't have changed my decision around this pole being at end of life, but I might have known it wasn't on roadside, it was off-road, and so my estimate could have been potentially bigger -- better at this early junction of

planning. It doesn't mean that it wasn't at end of life. So the condition and the need to replace it was the same.

When we have the discussion through the audit process, we want to have a very critical eye to support our continuous improvement initiatives. And to have an external party view, where could you get better, it isn't meaning it isn't sufficient to make decisions today; it really is a conversation around how can you help us identify areas to improve.

So those discussions do take place, but the process isn't intended to say you have a plan that's not justified or supported or you're identifying assets that don't need to be replaced; it's to say if you were going to go somewhere next where would you go?

So when we have those dialogues we're looking at, how do I use this to support my business, not how do I use it in this type of setting or form.

So when we do comment back we do have a dialogue around what this means, and if we -- if we have a significant issue with the recommendation, and our comments are included in the document.

MR. QUESNELLE: That's the comments I was referring to. It is, any of that capture what you are explaining to Mr. Rubenstein here this morning?

MS. BRADLEY: Right, the conversation for sure takes place, and we do comment. It is just, we're looking at it with a different eye to what we are trying to get out of the report.

MR. QUESNELLE: I understand.

MR. RUBENSTEIN: So I take it from the discussion, the asset analytics issue that's been identified by the auditor general and your own internal audit group, it has no impact with respect to the investment plan going forward and it made no impact with respect to the assets that you were generally replacing in the past. So what's the point of the exercise, of the asset analytics program?

MR. BOWNESS: The question that was asked of me was, is the asset analytics, as I'm remembering it, is the asset analytics leading to an asset being replaced that shouldn't be being replaced, right? So I was taking you through a positioning of making sure that we are not replacing a brand-new asset, as an example.

I think that if you look at analytics and how all industries are using data and information and analytics and predictive analysis and advanced computing technology with respect to machine learning, there's an ever improving basis to have really solid quality data that's helping inform and present information to our engineers to make better and better decisions, so if we sit here in the future and we have better data with better systems, will we make better decisions? Yes, but are we making better decisions today than we made five years ago? Absolutely. Are we making better decisions than ten years ago? Absolutely.

So this really is a continuous journey around improving our decision-making, ultimately resulting in the

best outcome, and ultimately yielding ever-improving outcome measures on reliability, customer service, financial performance, et cetera.

MR. RUBENSTEIN: But there is a high risk of suboptimal decision-making. That's what I took away from the second internal audit report.

MS. BRADLEY: I just want to look at when they define those risk factors -- where does it say this?

The risk factors defined on page 133 of your compendium, it says: "The risk will cause the objective to not be achieved." And the objective they were looking at in the case of having all the risk factors in the tool was the objective of having the risk factors in the pool.

They were looking at how is the asset analytics tool functioning, not the decision-making of the planner this case. They were looking for does the tool have everything you want it to have.

MR. RUBENSTEIN: So page 130, page 7 of that audit, the risk again is:

> "The absence of well-understood and quality asset information increases the risk of inadequate asset need assessment, which can result in diminished confidence in the process involving the AA tool and the potential for less than optimal investment decisions."

So take it from that that at least at the point of this internal audit report, you're going to have less than optimal investment decisions.

MS. BRADLEY: I would say -- I mean, this is probably a difference in how we interpret. I say -- here it says diminished confidence in the process involving the asset analytics tool.

We don't expect to push a button on a tool and get a list of assets to replace. We have planners who look at those results, who add the extra risk factors that aren't currently in the tool, and add that intelligence. And there are still some system that are disparate. It is not an all-encompassing tool at this point. There is work required outside of that.

MR. RUBENSTEIN: Could I ask you to turn to page 66 of the compendium? This is back to the original internal audit auditor general report follow-up. I'm looking at AG recommendation 13, which says: "Spending to maintain distribution system reliability." Do you see that?

MS. BRADLEY: Sorry, can you...

MR. RUBENSTEIN: AG recommendation 13, "Spending to maintain distribution system reliability." Do you see that?

MS. BRADLEY: I do.

MR. RUBENSTEIN: And one of the tasks that it says you still have to do was task 49; do you see that? It's at the time of this report?

MS. BRADLEY: Yes.

MR. RUBENSTEIN: And if we go to page 69 of the compendium to look at what 49 is, 49 says:

"Hydro One's distribution system plan is under

development and we will be having an independent third-party review of such in 2016."

Do you see that?

MS. BRADLEY: I do.

MR. RUBENSTEIN: Did you do that?

MS. BRADLEY: Yes, we did.

MR. RUBENSTEIN: And is that the AESI?

MS. BRADLEY: Yes, it is.

MR. RUBENSTEIN: Well, my understanding from the evidence was the AESI was to retained to determine if the DSP met the Board's filing requirements only. That was my understanding.

Did I not have that correct? I think that was what Mr. D'Andrea had said on panel 1.

MR. TANKERSLEY: So you are referring to the specific scope of work in the AESI report?

MR. RUBENSTEIN: Yes, I'm just trying to understand. Here it says that Hydro One's distribution system plan is under development and you are going to have an independent third-party review of such in 2016.

If I understand your view, the AESI work is that review and my question is: I understood from panel 1 that the scope of that work was really to make sure that it met the filing reports chapter 5 filing requirements.

MR. NETTLETON: I'm sorry, Mr. Chairman, I'm missing -- the witness answered the question to say 49 was addressed by the AESI report. And I'm not following what Mr. Rubenstein's next question is, because the witness was

asked and answered what her understanding was of how 49 gets resolved.

MR. QUESNELLE: I understand. But I think the line says to have a third-party review of such. I think what Mr. Rubenstein is asking is did that review go to what's in the plan, or does the plan meet the filing requirements.

MS. BRADLEY: On the front page of the AESI report, it does say that the plan was prepared in accordance with good asset management practice, industry best practices, and the current chapter 5 filing requirements.

MR. RUBENSTEIN: How about we turn to page 74, which is an interrogatory. We had asked you for certain information. If I can have you flip over to the next page, we had asked you about information they looked at besides -- I'll go back to the question, for fairness. It says:

> "Please provide a copy of all information AESI reviewed that is not already contained in the pre-filed evidence."

And part C says: "AESI was retained to review sections included in the DSP." Do you see that?

MS. BRADLEY: I do.

MR. RUBENSTEIN: If we go to the second paragraph, it says:

> "The information that Hydro One is relying on in its application is the pre-filed distribution plan. AESI's conclusions regarding compliance is now a moot point, given the OEB has set the application down for a hearing and in doing so,

has found the contents of the application accords with its filing requirements."

I understood that, and Mr. Nettleton and I had a large disagreement about this at the technical conference. But my understanding was essentially it was to determine if it met its filing requirements. And the position of Hydro One was that since the Board set it down for hearing, it met the completeness check and so the report was moot. There is no witness of AESI here.

MR. NETTLETON: In fairness, Mr. Chairman, we asked parties in advance of this proceeding who and which witnesses they requested from independent third parties. We asked that question specifically, and no one came forward to suggest that a witness from AESI was required.

So I don't think it's fair to make an adverse inference on the basis that no one from AESI is here when no party came forward to ask for a witness from AESI to be here.

MR. RUBENSTEIN: I'd ask you to review the transcript of the technical conference, where I had a large debate with Mr. Nettleton about wanting to see the information because -- and essentially told us that it doesn't really matter anymore, it's a moot point.

But I'll move an and I'll ask you then to move to page 78 and look at the deliverables of AESI. In the first bullet point:

"Provide best advice on the structure and format of a stand-alone DSP document to show direct and

clear alignment of the various components, explicitly showing how the process steps led to optimized DSP and corresponding capital in OM&A investment programs. Demonstrate expertise and capability in identifying areas of opportunity to meet the requirements of the RRFE and chapter 5 of the OEB's filing requirements regarding the DSPs.

"Showcase that the Hydro One's business planning process is based on its best (sic) values and strategic objectives, which consider the balance of its work program and associated risk."

MR. NETTLETON: Sorry, Mr. Rubenstein misspoke. It says "based on its business values and strategic objectives."

MR. RUBENSTEIN: Sorry if I misspoke; I didn't mean to.

"...which considered the balance of its work and associated risks. Ensure evidence demonstrating alignment between the proposed investment levels, customer engagement result, and asset needs."

So I see that as its after-the-fact reviewing to make sure it's presented correctly; is that not the correct interpretation of what AESI was doing?

MS. BRADLEY: I don't know if this was referred to after the fact or before the fact. I find -- you know, it talks about direct and clear alignment. It talks about

process steps leading to an optimized DSP and corresponding capital and OM&A investment programs.

I mean, that was the first bullet you read and I would -- condition data, how we develop those investment plans, is I think where you're trying to link this to.

I'm not -- I mean, to me, this shows that you looked at the process, you looked at the plans that resulted from that process, and they've provided a critique of that.

MR. RUBENSTEIN: Where it says "showcase that Hydro One's business planning process is based on its business values and strategic objectives, which consider the balance of its work program and associated risks."

I read that as they're supposed to showcase it, not to determine if it's an appropriate planning process.

MR. NETTLETON: Mr. Chairman, these are bullet points to the paragraph that starts: "Hydro One is seeking to secure the services of a qualified third-party to perform a thorough review of its DSP at various stages of its development. The successful proponent will..."

And that was one of the bullet points. So I don't think it's fair to characterize one bullet point and take it out of context of that statement that starts at the beginning.

MR. QUESNELLE: The point of your question, Mr. Rubenstein?

MR. RUBENSTEIN: Well, I was just trying -- I'll move on to ask some different questions.

So let me ask you this: Have you had an independent

third-party review the investment planning process?

MS. BRADLEY: The one that was -- at the time of this application there was this AESI review.

MR. RUBENSTEIN: And that's your view of a review of the investment planning process? Did they look at the optimization system? Did they look at what you were -- how you were inputting things in the AIP tool, how you were doing the weightings? Did they look at all that and...

MS. BRADLEY: I can't speak -- I wasn't here in this position when they did this review, so I can't speak to that, but this is the only review that I'm aware of that was done on this five-year plan.

MR. RUBENSTEIN: And am I correct, have you done an independent third-party review of your asset management processes or your asset condition information?

MS. BRADLEY: You're talking about in the preparation of this plan?

MR. RUBENSTEIN: Yes, or the last five years. I'm just -- have you had an independent assessment of your asset management processes and your asset condition information?

[Witness panel confers]

MS. BRADLEY: Earlier this year we did perform a third-party review of our planning process, of our investment planning process, as we were requested to do in the last transmission decision, but that was, you know, after this had already been filed.

MR. RUBENSTEIN: Okay, so the outcome --

MS. BRADLEY: You asked anytime in the last five years, so, yes, I have in the last five years.

MR. RUBENSTEIN: But that was before this application was filed and the planning process at the time of the --

MS. BRADLEY: It was after.

MR. RUBENSTEIN: Okay, so have you had anything similar to what you did with respect to vegetation management work with Clear Path where they're doing a deep dive into an area?

MS. BRADLEY: Prior to this application, the process used here, no, we're currently doing that for distribution through this planning cycle. We are having a -- we are using a slightly revised process.

MR. RUBENSTEIN: Did you want to elaborate on what you mean by "slightly revised process"?

MS. BRADLEY: For the transmission -- the transmission planning process we used last year we used different risk factors. And we are going to -- going to apply them in the process we use this year for distribution.

It is just a continuous improvement initiative that we've been looking at, how do we change things on an ongoing basis.

MR. RUBENSTEIN: What are the changes to those risk factors?

MS. BRADLEY: We are going to use safety, reliability, and environment risk factors. The other factors that we currently use as risk, we are using more as flags to say, you know, is there a requirement to connect to customer,

yes, so it is just a different methodology of capturing the risk factor.

MR. RUBENSTEIN: Well, it seems like a big change if you are essentially getting rid of a lot of the factors. You're using it as a flag instead of weighting it.

MS. BRADLEY: We are in the process of going through how we are going to use it in this planning process, so I can't speak to the specifics of how it's going to play out over the planning process, because we are just developing it right now.

MR. RUBENSTEIN: I think it's time for a break.

MR. QUESNELLE: Yes, Mr. --

DR. ELSAYED: I have a question before the break, just to clarify in my mind, the study that you said was done as requested by the OEB --

MS. BRADLEY: Yes.

DR. ELSAYED: -- is that the same as the AESI study or is it a different study?

MS. BRADLEY: It is a different study. One of the requests in our decision, the transmission filing that we got, the decision last fall, was that we have a third-party review of our planning process. So we've completed that process.

DR. ELSAYED: And what was the difference in scope between that and the AESI study?

MS. BRADLEY: That study wasn't a study of a DSP; it was a review of our planning process, and it compared our -- the planning process that we used for transmission to

best-in-class utilities and to the ISO standard around asset management, and so it was very focused on the planning process.

DR. ELSAYED: And the AESI was focused on the DSP?

MS. BRADLEY: Correct.

DR. ELSAYED: And when was the report issued on that study?

MS. BRADLEY: It was done in 2018, so I don't know -- I don't know the exact date. It was a transmission -- it was -- it was very transmission-focused.

DR. ELSAYED: I'm talking about the AESI one.

MS. BRADLEY: Oh, the -- the AESI report that is dated March 14th, 2017?

DR. ELSAYED: So that was before you submitted this application?

MS. BRADLEY: Correct.

DR. ELSAYED: So have you incorporated any of the recommendations from that report in this application?

MS. BRADLEY: From the AESI report?

DR. ELSAYED: Yes.

MS. BRADLEY: We would have taken -- we took any feedback we had, whether it was from AESI, auditor general reports, any input we had, we factored into our planning report.

DR. ELSAYED: Yeah, specifically the recommendations of the AESI report.

MS. BRADLEY: The only recommendations I am aware of in this AESI were more structural around the actual DSP

format, more than around -- more than around the methodology of planning.

MR. NETTLETON: Dr. Elsayed, there is an interrogatory that asked this very question about what outcomes has Hydro One incorporated from the AESI report. I don't have it at my fingertips. After the break I can certainly --

DR. ELSAYED: That would be helpful. Thank you.

MR. NETTLETON: Thank you.

MR. QUESNELLE: Mr. Rubenstein, we've got a scheduling issue that we'd like to take lunch earlier today at noon, and could you speak with Ms. DeMarco and see if there's any possibility that you could -- can you split your cross, I guess I could ask you now?

MR. RUBENSTEIN: Yes.

MR. QUESNELLE: And could we accommodate that, perhaps, and have that discussion over the break?

MR. RUBENSTEIN: No problem.

MR. QUESNELLE: Okay. We'll return at 11:35.

--- Recess taken at 11:19 a.m.

--- On resuming at 11:38 a.m.

MR. QUESNELLE: Ms. DeMarco?

CROSS-EXAMINATION BY MS. DEMARCO:

MS. DeMARCO: Thank you, Mr. Chair. First, can I start with my thanks to both Board Panel and Board Staff for accommodating my schedule. I have a little one who is graduating from high school today, and I am very appreciative to be able to be there.

And secondly, let me wish both Board Panel and the

witness panel and everyone in the room a Happy National Indigenous Peoples' Day. I hope I've got that right.

So I promise you I will be done within my allotted 30 minutes this morning. If not, you can bring out the hook.

So panel members, I have a few questions for you and the first is a point of clarification. With apologies, this is not in our compendium, but it is Exhibit B11, section 1.2, attachment 14, at page 810 or 23 of 47.

Fair to say that your asset management and distribution investment planning process is informed by the IESO integrated resource planning process?

MS. BRADLEY: Yes, that's fair to say.

MS. DeMARCO: And just on that page, the IESO planning process in and around the RRPP for the Greenstone-Marathon area identifies a few contingencies and scenarios that inform their load growth forecast.

They've got four of them there; do you see that?

MS. BRADLEY: The chart 5.1?

MS. DeMARCO: Table 5-3.

MS. BRADLEY: Yes.

MS. DeMARCO: So those are forecast scenarios that the IESO has brought into bear?

MS. BRADLEY: Yes.

MS. DeMARCO: And two, the elements of C include materialization of two sawmills, Geraldton mine, and a gas-to-oil pipeline conversion; is that fair?

MS. BRADLEY: Yes.

MS. DeMARCO: And would you agree that the gas to oil

pipeline conversion is the energy east pipeline?

MS. BRADLEY: Yes.

MS. DeMARCO: And that pipeline's been cancelled?

[Witness panel confers]

MS. GARZOUZI: I'm not certain.

MS. DeMARCO: Would you take, subject to check, that the Energy East pipeline has been cancelled?

MS. GARZOUZI: Yes.

MS. DeMARCO: And similarly, the Geraldton mine has yet to materialize; fair to say?

MS. DeMARCO: That's just a point of clarification. Later in that document, the IESO, at page 863 or 76 of 77, makes some general recommendations and they include new generation and lines upgrades. Is that fair to summarize them as such?

MS. BRADLEY: Can you just repeat the reference for me?

MS. DeMARCO: I'm sorry, it is the same Exhibit B1, section 1.2, attachment 14 at page 863, or their numeric references is 76 of 77.

Would you like me to repeat the question?

MS. BRADLEY: Yes.

MS. DeMARCO: The IESO generally recommends some new generation and some lines upgrades.

I'm sorry, it should be at the end of the document of the Greenstone-Marathon, page 863 of that, I believe. It's the very end of that, their recommendations.

MS. DeMARCO: This is it, yes. There are two stages

and those stages include some new generation and some lines upgrades, fair to say, very roughly?

MS. BRADLEY: Yes, I agree.

MS. DeMARCO: Thank you. And just -- I have in here your DSP section 1.4 at tab 1 of our compendium, and this is the world that was, as opposed to where we are now.

Fair to say that that DSP did not expressly mention upgrades to the lines in and around Greenstone-Marathon; do I have that right?

MS. BRADLEY: Can you repeat your question? Sorry.

MS. DeMARCO: Yes. Fair to say that your evidence Broadly, but specifically the DSP at section 1.4, didn't include any express mention of upgrades to the lines in and around the Greenstone-Marathon area?

MS. BRADLEY: No, we haven't captured transmission investments in our DSP.

MS. DeMARCO: So in terms of distribution investments as well, was there something specific that I've missed in your application?

Perhaps I can simplify the question and help out, because where I'm going is nowhere dramatic.

What we now have in the settlement proposal was not expressly mentioned in the original application; is that fair to say?

MS. BRADLEY: That's fair to say.

MS. DeMARCO: Thank you. And no specific ISDs or SS documents that I've missed somehow?

MS. BRADLEY: That's correct.

MS. DeMARCO: Thank you.

MR. SIDLOFSKY: Can I just interrupt at this point, just so we don't lose track of it? I'm going to mark the Anwaatin panel 5 compendium as Exhibit K7.1.

EXHIBIT NO. K7.1: ANWAATIN CROSS-EXAMINATION COMPENDIUM FOR HONI PANEL 52

MS. DeMARCO: I'm batting a thousand on this, missing my basic obligations of exhibit marking on this hearing, so with apologies to the Board Staff and the Panel and the witnesses.

We do have in our book of authorities at tab 1, page 5 of the compendium, table 8 which is the OEB scorecard. But it has been updated by you in response to an undertaking to me at J1.11 -- which is not in the compendium, with apologies.

MS. BRADLEY: It is SEC 29?

MS. DeMARCO: It is actually undertaking J1.11, which is a further update to SEC 29, as I understand it. This is a popular piece of evidence. It's gotten updated a few times during the course of this hearing.

So in this regard, even if you take out loss of supply and force majeure, is it fair to say that the rural SAIDI is still increasing? Is that fair?

MS. BRADLEY: Yes, that's fair.

MS. DeMARCO: And that's the duration of outages is still...

MS. BRADLEY: Correct.

MS. DeMARCO: I'm sorry, I didn't catch that on the

record.

MR. JESUS: Yes.

MS. DeMARCO: Thanks. And so the calculation -- now I have a calculation clarification that I don't know the answer to, but I'm going to put the question to you anyway.

When SAIDI rural is calculated, are there zero values included in that average? For example, if there's no interruption, does that go in as zero hours?

MR. JESUS: That's correct, if there's no interruption, then there's no impact. There's nothing to be added in the denominator or the numerator.

MS. DeMARCO: So for the duration of outages, that would go in as a zero value?

MR. JESUS: Correct.

MS. DeMARCO: For SAIFI is it quite similar? You've got total customer interruptions, and if the customer is not interrupted, does that go in as a zero value?

MR. JESUS: So which line are you looking at specifically?

MS. DeMARCO: I'm at page 13 of the compendium. And it's really just in around the calculation of how you calculate SAIFI.

[Witness panel confers]

MS. BRADLEY: I think the confusion is when we're calculating SAIFI we would take the number of outages and we would divide that by the number of customers served.

MS. DeMARCO: Total number of customer interruptions by the customers served. So if there's --

MS. BRADLEY: If there's no interruption it is just not factored in. Like, we are not counting every minute of every day to say this minute there was no interruption so it's a zero. We are just counting the interruptions.

MS. DeMARCO: So if there is not an interruption, it doesn't go in the average as a zero value.

MR. JESUS: So maybe I can help. So when an outage or an outage event occurs, all the customers that are interrupted get included in the numerator, so that is the total number of customers that are interrupted. Every single customer that is interrupted for that particular event gets included in the numerator. The total number of customers that form the rural or the urban or the system are what's reflected in the denominator. Ergo, you end up with SAIDI or SAIFI, so let's talk with SAIDI specifically. The total duration of interrupted customers per year -- it is the average of the number of customers that are interrupted per year on a duration basis, from a duration point of view, total duration.

MS. DeMARCO: So help me work through this, because I understand that to be CAIDI.

MR. JESUS: Total duration, the average duration of every customer that is interrupted during the course of the year, is SAIDI.

MS. DeMARCO: Yes.

MR. JESUS: The CAIDI represents the average interruption duration per outage --

MS. DeMARCO: Yes.

MR. JESUS: -- not per customer, different denominator, per -- the unit of measurement is different.

MS. DeMARCO: So following through with me, SAIDI, there is zero values incorporated in the average. Zero minutes would be calculated into that.

MR. JESUS: So by -- yeah, by definition, there's no customers that are interrupted, therefore they would not appear.

MS. DeMARCO: It's different than that. The duration.

MR. JESUS: So if I have -- can I help? If there is one event that interrupts three customers, only those three customers for the duration that they're out would appear in the numerator. All the other customers that are not impacted, they don't appear anywhere, other than the denominator, which is the total number of rural customers, because it's -- you add up with the total duration over the course of a year, divided by the total number of customers.

MS. DeMARCO: So in terms of the numerator, it's not disproportionately skewed if there is not an outage for a customer. Mathematically, you are not skewing -- so it is not an average of an average. It's absolute number over absolute number.

MR. JESUS: Absolute number, yes.

MS. DeMARCO: Thank you, that was helpful.

On page 17, the CAIDI has been corrected -- or CAIDI has been calculated, and you've indicated there that supply has been adjusted for; is that fair? Loss of supply?

MR. NETTLETON: Where are you, Ms. DeMarco?

MS. DeMARCO: I am at page 17 around -- of the compendium, around the calculation of CAIDI.

MR. JESUS: Okay.

MS. DeMARCO: And so as I understand it, that calculation was done with loss of supply and force majeure? I think this --

MR. JESUS: It depends on the situation. If you want to look at CAIDI with or without loss of supply, you would take the number of outages during those events that occurred when loss of supply and when there's no force majeure and you would end up with the CAIDI for those events.

MS. DeMARCO: Right, and -- thank you. In relation to your parameters, I'm going down now to pages -- starting at pages 23 through to 28 -- sorry, 29 of our compendium. I'm at -- the CAIDI parameter is page 29 of the compendium.

MS. BRADLEY: I think we are all on the same page now.

MS. DeMARCO: Sorry about that.

MS. BRADLEY: Which is which, 27 or 29? 29 of your compendium we see the CAIDI outage, yes.

MS. DeMARCO: Fair to say there that the second-highest cause of outages there or disruptions in -- is defective equipment.

MR. JESUS: Second-highest?

MS. DeMARCO: Yes.

MR. JESUS: No --

MS. BRADLEY: It varies by year.

MR. JESUS: Tree contacts. In 2016, if you look at

tree contacts was number one. Number two was adverse environment at 6.4, and defective equipment ended up being third at 3.99, so it's third.

MS. DeMARCO: In that year, but on average, fair to say that it's second?

MR. JESUS: Subject to check.

MS. DeMARCO: And same for SAIFI, we can say fairly, looking at figure 7 on page 28? Fair to say, the second -- also the second-highest cause?

MR. JESUS: Yes, it is.

MS. DeMARCO: And the same on page 26. Same for SAIDI, defective equipment, second-highest cause?

MR. JESUS: That's correct.

MS. DeMARCO: And moving on to 25, this is the CAIDI chart. And you've corrected for what should traditionally be known as force majeure and/or a loss of supply in this chart. So we see all the data in this chart; is that fair?

MR. JESUS: We see all the data with and without loss of supply and force majeure; that's correct.

MS. DeMARCO: And fair to say --

MR. JESUS: So the impact to the total system of whether you include force majeure events, whether you don't include them, as well as for loss of supply.

MS. DeMARCO: And fair to say, even when you're excluding loss of supply and excluding force majeure, the CAIDI is increasing? And I'm referring specifically to the bottom line of Table 12 on that page.

MR. JESUS: Yeah.

MS. DeMARCO: I'm now going to ask you a few questions specific to reliability in First Nations and Anwaatin communities, and much of this is at tab 3 of our compendium. And page number --

MS. BRADLEY: Is there a page? Because I'm not sure I get the tabs in here. I'm not sure --

MS. DeMARCO: Yes, it's page 60.

MS. BRADLEY: Thank you. That helps.

MS. DeMARCO: And these were a series of questions regarding reliability in the Anwaatin First Nations communities.

And would you agree with me that all of the responses are based on five-year data?

MS. BRADLEY: Correct, yes.

MS. DeMARCO: And generally, the more data the better?

MS. BRADLEY: I don't agree that the more data the better. In some cases the further back you would go, there could be changes in the system that you are not capturing or you're not aware of, so it does depend. There is some risk. If you go back further you are not comparing like for like.

MR. JESUS: I would also add that there may have been improvements more recently that would change the numbers or the trend going forward. So some -- if a feeder was in poor condition, for example, and we've rectified that situation, it would still show on the five-year average, but the improvement is already in place. So it wouldn't show that.

MS. GARZOUZI: So all things being equal, a lot of data is helpful to establish trends. However, the distribution system and the transmission system are dynamic and they change. Those changes are not accounted for in history, and so it's important to take those into account when you're trying to project forward.

MS. DeMARCO: That's very helpful. That's where I was going.

And in relation to those general projections, I'm going to ask you at each point whether you think they would change with more data. My general assumption is that they won't, but I'll put it to you specifically.

So at the compendium page 63, this is a reading glass exhibit. This is all the First Nations in the province, with the Anwaatin First Nations highlighted in yellow, outlining their five-year average SAIDI for feeders.

Is it fair to say that the Anwaatin communities collectively have the highest average duration of outages in Ontario?

MS. BRADLEY: I would characterize this as showing that the average is higher than the northern system average.

MS. DeMARCO: We're actually -- just to clarify that point, we're actually talking about the Hydro One five-year system average, not the northern system average. Is that right?

MS. BRADLEY: There is the Hydro One five-year system average, yes, you're right and the First Nations five-year.

MS. DeMARCO: So let me be more precise. I was imprecise, with apologies.

The Anwaatin five-year average SAIDI, the duration of outages is higher than the Hydro One five-year average system wide?

MS. BRADLEY: That's correct.

MS. DeMARCO: And higher than the First Nations system wide -- First Nations average?

MS. BRADLEY: Correct.

MS. DeMARCO: And moving on to the SAIFI calculation at page 64, is it fair to say that the Anwaatin five-year average for the frequency of outages is also the highest among that group?

MS. BRADLEY: The average is, correct.

MS. DeMARCO: Yes, so higher than the Hydro One five-year system average?

MS. BRADLEY: Correct.

MS. DeMARCO: And higher than the First Nations five-year system average?

MS. BRADLEY: That's correct.

MS. DeMARCO: And at page 65, here we've got a metric that you've done, looking at very specifically the Anwaatin feeders compared to the Hydro One system average, the First Nations system average, and your urban and rural customers. Is that a fair characterization of that graph?

MS. BRADLEY: Yes, it is.

MS. DeMARCO: And fair to say that there again, Anwaatin has the worst reliability when compared to Hydro

One system average. Fair?

MS. BRADLEY: Fair.

MS. DeMARCO: First Nations five-year system average?

MS. BRADLEY: Correct.

MS. DeMARCO: The rural rates -- this is the turquoise bands?

MS. BRADLEY: Correct.

MS. DeMARCO: And certainly the urban rates, the orange bands?

MS. BRADLEY: Correct.

MS. DeMARCO: And would you take, subject to check, that that's the same for SAIFI, each of those elements? Anwaatin has the worst five-year average for frequency? This is figure C2.

MS. BRADLEY: Yes, that's correct.

MS. DeMARCO: Worse than the Hydro One system average, fair?

MS. BRADLEY: Yes.

MS. DeMARCO: Worse than the five-year system average for First Nations, fair?

MS. BRADLEY: Correct.

MS. DeMARCO: Worse than Hydro One rural, fair?

MS. BRADLEY: Yes.

MS. DeMARCO: And worse than Hydro One urban, fair?

MS. BRADLEY: Yes.

MS. DeMARCO: I'm asking you to turn to page 66 now, figure D.2. It appears to me that about 31 percent of those outages are due to defective equipment; is that fair?

MS. BRADLEY: That's correct, yes.
MS. DeMARCO: About 17 percent are unknown cause?
MS. BRADLEY: Correct.
MS. DeMARCO: And only 12 percent are due to tree contacts?
MS. BRADLEY: That's correct.
MS. DeMARCO: Thank you. I'm going to ask you to move on to page 69 of our compendium. This is figure G.1 and I'm going across year-by-year, and it appears as though generally tree contact outage are largely the lowest in the province for the Anwaatin communities. Do I have that right?
MS. BRADLEY: You are looking at G.1, correct?
MS. DeMARCO: That's right.
MS. BRADLEY: I would agree with that.
MS. DeMARCO: Thank you. And in terms of force majeure generally, you've got a list of all force majeure events that you've included in your evidence, and I'm going to -- I believe that's in or around page 18 of the compendium. It starts at page 18 and continues for a few pages, is that right?
MS. BRADLEY: Yes.
MS. DeMARCO: And that's an exhaustive list?
MS. BRADLEY: A complete list? Yes.
MS. DeMARCO: Thank you. And one point of Clarification. I'm at pages 74 to 76 of our compendium, not for the substance, but for my own -- and I believe for potentially the Panel's edification. The asset life; is

that exactly the same as the pole age?

MR. BOWNESS: We see asset life -- sorry, average pole age in this table. But can you point us to where you're seeing asset life?

MS. DeMARCO: Yes. Could I ask you to turn to the interrogatory itself, which was starting at page 60. You will see under interrogatory A you were asked:

> "Please provide feeders serving the First Nations referenced above, a description of each asset, its age, useful life, and planned replacement date."

And you responded with "pole age."

MS. GARZOUZI: So the pole age column is the age of the pole, so it is the stamp date on the pole.

The expected service life of wood poles is 62 years for all poles that's in the population.

MS. DeMARCO: But it's not the same as the asset age. What would be the asset -- it's the pole plus what?

MS. GARZOUZI: In this case, it's the pole itself.

MS. DeMARCO: So in your response, it's the pole itself. But when you're talking about the asset life, is it the pole plus something, or is it only the pole?

MS. GARZOUZI: Okay. So if we go back to, in your compendium, page 74. So what we see is the supply. That's the circuit, so that's a circuit identification -- sorry, it's the distribution station that supplies that community.

Next to that is the feeder; that's the circuit identification. So there are multiple poles emanating from

that circuit. So in this case, there's 600 -- on the first line, 665 poles. So instead of providing the age of every single pole, what we did is we took the average age of all those poles and that's why it's an average pole age instead of providing every pole age.

MS. DeMARCO: So just so that everyone in the room is clear on this point, is the pole the entire asset or is that something else? Do you have to add in something?

MS. GARZOUZI: That's the entire asset.

MS. DeMARCO: So when I asked for the asset life, giving me the pole age -- or asset age, giving me the pole age is it? That's all the data we need?

[Witness panel confers]

MS. GARZOUZI: Okay. So in terms of how we manage our assets, we have the age of our transformers at the stations and of our wood poles, and so in the table here it's just an average.

On conductors we don't track their age per se, so it is not something that we would manage in that way, nor do we do that for insulators and other components of the distribution system.

MR. QUESNELLE: Ms. DeMarco, the original interrogatory that you brought us to asked for the asset age and its use -- or the pole age end-useful life, and I don't think that the response did provide you with that. I think on the record just now it was provided as being 62 years of expected useful life; is that correct?

MS. GARZOUZI: That's correct.

MS. DeMARCO: Mr. Chair, as I understood, that's for the poles; is that correct?

MR. QUESNELLE: Yes.

MS. GARZOUZI: That's correct.

MS. DeMARCO: And so I don't have to consider anything else other than the poles to say the average useful life of the asset of the transmission line distribution system and feeder asset.

MS. GARZOUZI: So from a line --

MR. QUESNELLE: The line is made up of multiple assets?

MS. GARZOUZI: Yeah, the line is made up of multiple assets. That is the dominant and most relevant or most important date.

For the station component, the more critical asset is the transformer. The age there is something that we have, and then it would be the recloser at the station. The age is not as relevant.

What is more interesting is how many times the recloser has operated, so on our 1005 distribution station we keep track on the recloser account, operation account. And so from, you know, back to the IR question, which is...

[Witness panel confers]

MS. GARZOUZI: There are many components to the distribution system, and probably the most relevant are the transformer at the distribution station and, from the lines perspective, the wood pole.

MS. DeMARCO: I wonder if you can update that response

to include the transformer at the distribution station.

MS. GARZOUZI: Yes, that could be done.

MS. DeMARCO: Thank you. I wonder if we can mark that as an exhibit (sic).

MR. SIDLOFSKY: That will be K7.2.

MR. QUESNELLE: J?

MR. SIDLOFSKY: Sorry, Ms. DeMarco, you asked for an exhibit or an undertaking?

MR. QUESNELLE: Undertaking.

MS. DeMARCO: Undertaking.

MR. SIDLOFSKY: Thank you, J7.2.

UNDERTAKING NO. J7.2: TO UPDATE THE RESPONSE TO INCLUDE THE TRANSFORMER AT THE DISTRIBUTION STATION.

MS. DeMARCO: If I misspoke I'm sorry.

So let's put that in the bucket of what was current status of the reliability metrics, and now let's move on to what is. And tab 4, at -- starting at page 90, I believe, of our compendium is the settlement agreement entered into between Anwaatin and Hydro One. Sorry, it's page -- the settlement agreement itself starts at page 77 of our compendium, but the substantive data I'm going to take you to is starting at page 95, if you want to go there now.

Contextually this is a very novel approach for Hydro One, fair to say?

[Witness panel confers]

MS. GARZOUZI: Yes.

MS. DeMARCO: And it took a fair amount of work internally, fair to say?

MS. GARZOUZI: Yes.

MS. DeMARCO: And you all had to be quite creative and pull a few all-nighters to get there, or burn the midnight oil anyway, fair to say?

MS. GARZOUZI: We did spend a lot of time on this, yes.

MS. DeMARCO: And let's look at the outcome of your hard work. If we can turn to page 95, we have a graph showing the current state of affairs at the Nakina feeder stations, feeder station F2.

And in general there are, over the five-year period, 54 outages, totalling 286 hours; fair to say?

MS. GARZOUZI: Yes.

MS. DeMARCO: And by my very poor calculations, so correct me if I'm wrong, I've got that as an outage on average every five weeks, all throughout the five-year period.

MS. GARZOUZI: Yes. Yes.

MS. DeMARCO: And those outages, by this graph, can last over 25 hours per outage; is that fair?

MS. BRADLEY: That's.

MS. GARZOUZI: That's the most significant outage experienced by that community; that's correct.

MS. DeMARCO: And proactively, if you go down to page 98, you're considering distributed energy resource solutions that could possibly take those outages down to an average of one outage per year. Is that fair?

MS. GARZOUZI: That's correct.

MS. DeMARCO: So from one every five weeks to one per year; is that fair?

MS. GARZOUZI: Yes.

MS. DeMARCO: And the duration of those outages from up to 25 hours down to a total of 35 hours for the whole five-year period; is that fair?

MS. GARZOUZI: That's correct.

MS. DeMARCO: So significant potential improvement?

MS. GARZOUZI: Yes, all things being equal, if we were -- if history reproduced itself with a battery of this size, that is the improvement that we would predict.

MS. DeMARCO: And you agree that it's similar for the Moosonee project that you are considering, similar improvements that you are looking at; fair to say?

MS. GARZOUZI: The improvements are similar. The difference with Moosonee is there was a transmission investment that will significantly benefit the community, hence the loss of supply that were historically experienced, which were meaningful, are expected to be reduced significantly in the future, and so there is a net improvement immediately. Battery storage or alternative investments would further then benefit the reliability to the community of Moosonee.

MS. DeMARCO: That's great. And finally, looking at how you're proceeding, you're not betting the farm on this; fair to say? You are proceeding in a prudent, staged manner; is that fair to say?

MS. GARZOUZI: Yes.

MS. DeMARCO: And specifically, let's look at what is required and what's not required.

You've done technical assessments for Nakina and Moosonee, and you are looking at evaluating other possibilities on how you might implement that with a range of battery storage options; is that fair?

MS. GARZOUZI: That's correct.

MS. DeMARCO: And there is still some decision-making that has to go on?

MS. GARZOUZI: Yes, this package or this undertaking is a projection on what we might expect if we were to install batteries at both Nakina and Moosonee. This would be a first of its kind at Hydro One. These are predicted benefits with preliminary discussions with vendors. We have not done the detailed engineering yet, and once we've completed that and the sizing of the battery is established, that would be weighed against the economical benefit gain, so risk mitigated versus dollars spent. We would then right-size the battery.

As you saw, one of the outages was 25 hours. You wouldn't necessarily buy a battery to mitigate that outage, so you would try to capture the most outages possible in the most economical way. Once we with have that, then we would determine if we proceed for investment and then in that case, you know, more concrete predictions would be established.

MS. DeMARCO: And moving on to phase 2 of that project, which is focused on the WZI communities, fair to

say the commitment of the parties there is to do the technical assessment and that's it at this point; is that fair to say?

MS. GARZOUZI: That's fair to say.

MS. DeMARCO: And then at that point, both the First Nations communities and Hydro One will take back the outcome of the phase 1 and the technical assessment and determine if it's feasible; fair to say?

MS. GARZOUZI: That's correct.

MS. DeMARCO: We can both assure each other, fair to say at this point, that there is no firm commitment to go forward unless it's feasible for all parties? Fair to say?

MS. GARZOUZI: That's correct.

MS. DeMARCO: And those are my questions.

MR. QUESNELLE: Thank you, Ms. DeMarco. We will break for lunch and return at 1:20.

--- Lunch recess taken at 12:20 p.m.

--- On resuming at 1:24 p.m.

MR. QUESNELLE: Good afternoon. Please be seated.

If there's no other matters to take care of, then Mr. Rubenstein, recommence.

CROSS-EXAMINATION BY MR. RUBENSTEIN: (CONT'D)

MR. RUBENSTEIN: Thank you very much, panel. Good afternoon. I was wondering if we could start at page 46 of the compendium, and this is Board Staff interrogatory 121, and you were asked in part A to "please provide the five-year historical percentage used as project contingency and compare that to the current", and then you provide your

response in part A on the next page. Do you see that?

MR. BOWNESS: Yes, I do.

MR. RUBENSTEIN: And as I understand from the interrogatory response you say that:

> "Currently, all investments have built-in standard contingency of 10 percent except for projects over $5 million that have their own contingency allocation and it might vary slightly from the 10 percent."

Do I understand that's how you budget?

MR. BOWNESS: Yes, that's how we had budgeted the items in the plan.

MR. RUBENSTEIN: And you say about halfway through that paragraph:

> "Since 2012, Hydro One has refined its estimating and field execution such that it has significantly reduced contingency usage over the past six years, reducing our contingency use from 75 percent to less than 20 last year."

Do you see that?

MR. BOWNESS: Yes, I do.

MR. RUBENSTEIN: And what you are referring to with the less than 20 is that in 2017 you are using 19 percent of your contingency, correct?

MR. BOWNESS: Yes, so the projects that were executed in 2017, we averaged 19 percent contingency.

MR. RUBENSTEIN: So now if you are only using 19 percent of what is 10 percent of the project that is built

into contingency, isn't it time to reduce the contingency amount built in significantly?

MR. BOWNESS: So a few aspects. One is the actual costs only include the amount of contingency that's actually spent, so the 81 percent is money that is made available to other investments within the capital envelope.

We're constantly looking at refining our percentage of contingency on projects and we're currently going through a process for our projects within the distribution project domain to improve our estimating processes. And we will be looking at contingency percentages going forward.

MR. RUBENSTEIN: But currently, based on the information that's in the contingency amount built into the capital plan, aren't you overstating the cost of your investments by including 10 percent contingency for all your assets on average, except you're using much less than that?

MR. BOWNESS: So I think if you look on average across the last three years, the average would be in the 40-ish percent range, and I think we also have to put this in context, is out of the work that is under my area of accountability, approximately a billion dollars of expenditure, 82 percent is program-related work, so we're talking about 18 percent of the portfolio, we're talking about 10 percent of that 18 percent, and then we're talking about a variability of a very small percentage point, so we're talking about very small numbers from the big-picture perspective.

MR. RUBENSTEIN: Well, let's just say, using your numbers, about 40 percent for the last three years. Let's use that for a second. Doesn't that mean then, if 40 percent of 10 percent is really what's being used, you are overstating 6 percent of the cost of every one of your projects and programs? Since you're not using 6 percent, the 60 percent of the 10 percent?

MR. BOWNESS: No, I wouldn't characterize it that way. We're looking at approximately 20 percent of the portfolio is project-based, okay, so within that 20 percent, 10 percent is contingency, so we're looking at 2 percent of the overall expenditure, and then you would look at, right now, we're using on average only 40 percent of that amount, so we're really talking about a decimal point of cost relative to the overall portfolio.

And then I'd go back to my initial comment with respect to any funds that are not spent within a project are made available to other investments within the portfolio.

MR. RUBENSTEIN: Does programs have contingency built in?

MR. BOWNESS: No, programs are based on unit cost estimates.

MR. RUBENSTEIN: And so we're only talking about projects?

MR. BOWNESS: That's correct.

MR. RUBENSTEIN: And you said -- I'm sorry, how much -- what percentage of the capital plan would you say were

projects? I didn't catch what you said.

MR. BOWNESS: So that proxy that I used for the portfolio that I directly manage of approximately 20 percent would be across the -- would be a similar percentage across the overall capital expenditure.

MR. RUBENSTEIN: So then wouldn't you say that if we're using 40 percent as sort of an average over the last three years, then of that 20 percent, 6 percent of that is, you're over-forecasting the cost?

MR. BOWNESS: What I would say is that within our project envelope we're using an industry practice of 10 percent of the estimates. A number of the estimates that are within -- a number of the projects that are within the five-year plan are planner's estimates, which are still high-level estimates.

So we're really -- what I'm struggling with here is we're talking about hundreds of thousands of dollars or -- I'd have to do the math on it, subject to check -- less than a million dollars within a portfolio of a billion dollars, so the percentage here, whether we set contingency at 5 percent or 10 percent, doesn't have an impact on the cost to execute the projects, nor does it overstate the ask, because, as we know and we've seen in the evidence, is that, you know, we have more work than we can afford to do if you look at the deltas between Plan A and Plan B modified, and any dollars that we can save within executing work, we're going to reinvest in the assets that need investment.

MR. RUBENSTEIN: I understood from the discussion we had on the first day your plan is to spend roughly $3.5 billion of capital over this five-year plan.

MR. BOWNESS: Over the five years, yes.

MR. RUBENSTEIN: Yes, so if we take 20 percent of that, which is the projects base, as I understood you're saying, that's -- 20 percent of that is what we're talking about in projects; do I understand that?

MR. BOWNESS: Would that be across the --

MS. GARZOUZI: Can I just point you to B-1-1, DSP section 3.7, and that summarizes -- here you see a list of the investment summary documents.

MR. RUBENSTEIN: Mm-hmm.

MS. GARZOUZI: So in the distribution business there is a large number of programs or investments that are demand in nature, and those do not have contingencies built in. Programs would not have contingencies built in, and, you know, you're honing in specifically into projects, but if we look at this here, if you look at the large capital spends, they are mainly demand drivers, which have no contingency built in, or programs.

MR. RUBENSTEIN: Well, that's where I go back to the question: What percentage roughly would you say of the roughly $3.5-billion in capital spending is projects that have contingency built in that we're talking about in the Staff 121? I thought it was 20 percent, but maybe I'm -- that was -- we're talking at cross-purposes.

[Witness panel confers]

MR. BOWNESS: So I want to make sure that we're not mixing up data points across the overall capital expenditure and the expenditure that's under operations, execution, accountability. So the investments that take place in our IT group as an example would have different financials associated with use of contingency. This contingency is specific to distribution, power system, asset projects.

So if I look at 2018's expenditure, our overall project budget for this year is $145 million.

MR. RUBENSTEIN: For this year?

MR. BOWNESS: For this year. So if we were to take this contingency element, it's with respect to that $145 million of projects.

MR. RUBENSTEIN: Okay.

MR. BOWNESS: Okay. So if we were to take 10 percent of that $145 million of projects, we would be at $14.5 million that's associated with contingency.

On average over the last four years, we've used 40 percent as opposed to 100 percent. So 40 percent of 14.5 million would be approximately $6 million, rough math, subject to check.

So within a five-year period we could say that there could be upwards of $30 million of contingency that could be redirected to other investments in order to move back towards our asset needs that are identified under a plan A model.

MR. RUBENSTEIN: Sorry, that 30 million you're talking

about is the total contingency, or the unused contingency that you would be re-directing?

MR. BOWNESS: So the way I did the math was 14.5 million annually of contingency, and we said that on average, right now we're having 6 million of unused contingency within the year.

So over a five-year filing against the $3.5 billion of spend, there is a, subject to check, 1 percent variability.

MR. RUBENSTEIN: And that one percent over the five years equals about 30 million?

MR. JESUS: Yes.

MR. RUBENSTEIN: So in essence, you have overstated the overall capital plan based on what is actually likely to occur in terms of how you've costed by $30 million, correct?

MR. BOWNESS: No, what I would say is that it is a best practice to have contingency identified for projects.

If I think about our major capital project work program on the transmission side of our business, we use 10 percent as an industry standard percentage. And if I look at the distribution side, we're doing something similar.

The fact that we're seeing in the last number of years that we're using less contingency is an opportunity for us to refine our estimates as we go into projects, to improve the estimating aspect.

However, if you look at years 2, 3, 4 and 5, those projects haven't gone through project estimating yet. So it is a culmination of historical averages of actual spend,

that the planning group uses to identify the portfolio of work.

So if I think about 2019 through 2022, planning on a project-based item is saying we're going to do X number of units for a historical average of Y dollars.

The Y dollars would be based on actuals, so it would be based on actual contingency use. So I don't think it's fair to say that the overall portfolio is over estimated by 30 million. What we were purely doing is if we projected a contingency utilization going forward, that would be the rough math that we looked at.

MR. RUBENSTEIN: But as of today, when you're forecasting the cost for the next five years, it is based on the costing that you have now.

MR. BOWNESS: The forecast for the next five years, for years 2 through 5, are based on planners' estimates which are based on actual expenditure, which would reflect actual contingency utilized, not planned contingency.

MR. RUBENSTEIN: So am I then to understand where it says you allocate a standard 10 percent, that's not correct. What you are allocating is 40 percent?

MR. BOWNESS: When we get to a project and we develop a new business case, we initiate -- we initially set the contingency at 10 percent. But there's a number of investments that aren't at the business case yet, so they are in macro. The portfolio is assessed based on actual expenditure, which would better reflect actual contingency utilization, which over the last five years, per the

exhibit -- where did it go? -- would be closer to, I would say, 65 percent.

DR. ELSAYED: I'm not sure if I understand this. You're talking about projects that are lower than -- cost less than $5 million.

MR. BOWNESS: Yes.

DR. ELSAYED: And the ones that are greater than $5 million, you do a best case based contingency evaluation.

MR. BOWNESS: Yes, and going forward, we are going to be doing detailed estimates on all our projects.

DR. ELSAYED: But right now, you do it for greater than $5 million projects.

So for the less than 5 million, do you allocate the same contingency to projects that are going to be executed in the next month, the same as you would for one that would be executed five years from now?

MR. BOWNESS: So the methodology we use around contingency use is as a project gets closer to in-service date, the contingency i8s released pack to the portfolio.

DR. ELSAYED: Sorry, I'm not talking about the execution. I'm talking about your plan. You have 100 projects planned for the next five years, and each project in your portfolio has a contingency associated with it.

Would the contingency associated with a project planned for 2019 be the same as one that's planned for 2022?

MR. BOWNESS: So a project that would be executed in

2019 would be going through, under our new process, an estimate. I would say a project that's under execution right now would have gone through a thumbnail sort of approach of the 10 percent.

So if you look at a project that's in 2022, it hasn't gone through an estimate. It is still a planner's estimate, so it's based on -- this is a similar project to what we did in 2016, similar scope, and they would say that, you know, based on that type of project, it's a $2 million project because that's what the actuals were two years ago with some escalations for inflation.

So it wouldn't get down to the level of detail of planning project management, engineering, construction, materials, fleet, equipment, labour contingency. We don't get to that level of detail until we're at the point of triggering the project from an execution perspective.

DR. ELSAYED: Would you do the same thing with projects that are over $5 million?

MR. BOWNESS: So right now we only have one project that is over 5 million, the Leamington project that we're working on. So we went through a very detailed bottom-up estimate on all the different activities and we did a -- we do a risk assessment associated with that to figure out what is the likely areas of risk, what's the impact of that risk, the probability of that risk, and then we would set contingency based on the overall risk profile of that project.

DR. ELSAYED: Thank you.

MR. RUBENSTEIN: May I ask about vegetation management. Obviously we had a lot of discussion on the last panel with Mr. Tankersley, but I'd like to discuss the program from your perspective.

If we turn to page 134, as I understand it, the vegetation management budget for 2018 that you are requesting is $149.6 million. Do I have that correct?

MR. BOWNESS: Yes, that's correct.

MR. RUBENSTEIN: And that's the largest single OM&A project, correct?

MR. BOWNESS: Vegetation management is a program.

MR. RUBENSTEIN: Sorry, that's the single largest program that you do?

MR. BOWNESS: Yes, that's correct.

MR. RUBENSTEIN: As I understand it, based on the evidence when you originally filed, at that point you had already made a number of changes compared to the last proceeding; do I understand that? It's described on page 139 if you...

MS. GARZOUZI: Yes, just a bit of context on this.

The previous method in the last rate filing was more about clearing ground and wall corridor for the right of way, so wider clearing, longer cycle.

What was in the pre-filed, I'm going to call it the hybrid approach. So it was keeping some circuits, mainly main trunks, higher criticality segments of the distribution system on circuit to get efficiencies from being on cycle.

And then we have what we discussed with Mr. Tankersley in Exhibit Q, which is the optimal cycle protocol, just taking that a step further, and cycling through the province on a three-year cycle and focusing on the high criticality defects, foregoing the low criticality defects.

So those are the three -- so in pre-filed, what you read in C11, schedule 2, what's described in that section is that hybrid approach, in Exhibit Q what is described as the optimal cycle protocol.

MR. RUBENSTEIN: Well, if we could just go to page 139, you actually summarized the prefiled evidence as a lead-up to explaining how you changed to the optimal cycle, and that's what you're talking about at line 16 to 22? That's what you were discussing. That's how you move from the last proceeding, the 416 proceeding approach, to the prefiled evidence, correct? That's just a quick summary, I think, of what you were just discussing; do I have that correct?

MS. GARZOUZI: That's correct.

MR. RUBENSTEIN: And if we go back to page 134, this is a table, as well, comparing past vegetation management OM&A to the test year, and also versus forecast versus approved, correct? That's what Table 5 is showing us?

MR. BOWNESS: Yes.

MR. RUBENSTEIN: And when I look at this table, what I see is you spent less than what you were approved every year, is that correct, in the last -- the 2015 to 2017 plan?

MR. BOWNESS: Yes, that's correct.

MR. RUBENSTEIN: In fact, would you take it subject to check that the average -- that you spent on average $19 million less per year, about 12.5 percent less?

MR. BOWNESS: We spent $11 million less in 2015 and $22 million less in '16 and 25 less in '17, so if that averages out to the number you mentioned, then, yes.

MR. RUBENSTEIN: Now, am I correct that based on your internal numbers in September you actually forecasted not to spend the $142.9 million on Table 5 for 2017; correct? You can see that on page 138? You actually forecast to spend, in September of that year, $129.3 million.

[Witness panel confers]

MR. RUBENSTEIN: I'm looking 2017, year-end actuals, 129.3, and the two --

MR. BOWNESS: I'm just clarifying timing --

MR. RUBENSTEIN: -- services, 2017 forecast --

MR. BOWNESS: Yeah, I'm just clarifying timing. My understanding is the timing of the 142.9 million was June's forecast and the 129.3 would have been our September forecast.

MR. RUBENSTEIN: Do we know what your actual actuals were for that year, what you ended up spending? I'm not sure I saw that number on the record, actually, for this specific program.

[Witness panel confers]

MR. BOWNESS: We do have the information in our financial records. I'm just -- we're just trying to find

where we have it in evidence. Just give us a moment, please.

[Witness panel confers]

MR. BOWNESS: So within the evidence update I think we are rolling it in under the sustainment line within I, tab -- Exhibit I, tab 38, SEC 70. However, looking within our financial records, we did end up with our DX forestry OM&A line item coming in at 129.4 million, which is very similar to what was in the September forecast.

MR. RUBENSTEIN: Now, if I look at this table I see that for 2016 and 2017 -- so we have an OEB-approved number at the top, that's what the Board approved, then we have the HONI-approved budget. Do you see that? So that's a -- you -- the board gave you an amount, and then you revised that amount annually, correct?

MR. BOWNESS: Yeah, as a part of our annual budgeting process and business planning process, there are sometimes changes within different work program items, so, yes, there was a change in what was in 2017's plan as compared to the OEB-approved amount.

MR. RUBENSTEIN: Same with 2016, correct? 164.6 million was approved, but the HONI-approved budget was 145.7?

MR. BOWNESS: Yeah, and if we look at the -- Table 1 on page 138 of your compendium, there is a footnote down at the bottom with the one asterisk. That's the discrepancy between the OEB-approved amount and the HONI-approved as due to redirection to customer care and trouble calls, so

those were the redirection decisions that were made in that year. That's where the dollars were spent.

MR. RUBENSTEIN: And yet even with the revised budget, you underspent in 2016 and 2017 versus your own revised approved number, correct?

MR. BOWNESS: Umm... Slightly, yes, in 2016, and in 2015 it was a more significant underspend. However, we did accomplish all of the units that year, so you will notice that we did accomplish 10,366 kilometres against a planned of the OEB units of 10,200, so we were able to execute the commitment we had from a unit perspective, even though we spent some less money in that calendar year.

MR. RUBENSTEIN: And is that why you underspent, because you hit the target and then that was it?

MR. BOWNESS: I'm not able to speak to the reasons for that. I wasn't accountable for the team at that time.

MR. RUBENSTEIN: Because my understanding as part of the evidence is we can't really compare the units from the last times. It's a different -- you are doing different things.

MR. BOWNESS: It is. There is three stages to our maturity with our evolution with respect to the vegetation management strategy. We had a historical approach which was very much corridor clearing, which was the '15 and '16 period.

In 2017 we made some adjustments to working towards corridor clearing, key feeder clearing, as well as hazard tree identification and clearing with respect to hazard

trees.

And then in September of 2017 we did make the transition over to our new optimal cycle protocol approach, so 2017 definitely has a few different models that are in place. So it is difficult to compare year-over-year numbers.

MR. RUBENSTEIN: Well, that's why I asked about why you underspent, and you said you achieved the -- at least what I heard you see say, and maybe I was incorrect, that you achieved the number of kilometres, but --

MR. BOWNESS: That's part of the reason. When we look at redirection we look at the goals and the outcomes and the objectives of what we're accomplishing on a monthly basis. We work with our planning group around variances that we are seeing, and we are also approached with respect to redirection requests for other areas of the business that are dealing with variances, and we make some strategic decisions in a year around how to handle those variances.

MR. RUBENSTEIN: I took it you said you weren't responsible, so do you actually know? It's fair if you don't know.

MR. BOWNESS: So when I was referring to not knowing I was referring to the 2015 year.

MR. RUBENSTEIN: Okay.

MR. BOWNESS: I've been a member of the leadership team for the last few years, so I am familiar with the changes specifically in 2017. And I did take over accountability for the distribution group in August 2017.

MR. RUBENSTEIN: So then the reason that you underspend compared to your own budget in 2017 was...

MR. BOWNESS: So there were a few factors at play within the 2017 year. One factor -- so there's a couple of deltas, right. There is the delta between the OEB-approved amount of the 167.3 and the budget of 138.5; we spoke to that.

The delta between the 138.5 and the year-end actuals of 129.3 is driven based on our ability to accomplish the outcomes, i.e. the work units that we wanted to accomplish for lower cost within that year.

MR. RUBENSTEIN: I thought on the capital side, you keep saying -- when we were talking about contingency, if there is contingency left over, we do more work. But is that different on the OM&A front? Because here you had less -- you've said you achieved your work, but you didn't do more.

MR. BOWNESS: Yes. So when we look at OCPA, in particular in 2017, we didn't have the ability to ramp up and deliver more units under the OCP strategy within the year.

We were wanting to make sure we were prudent and we were taking our time to get it right. So we executed a plan between September and December to clear approximately 5,000 kilometres under the new OCP strategy, but we wanted to make sure that we were getting it right.

If I was to fast forward to where we are now, if we are able to accomplish the work program for less dollars,

what we would then do is we would go back to planning and we would say we have an opportunity where we are able to accomplish the outcomes. How would we like to best utilize that additional funds. And it would go into redirection to say one option is to do more units of vegetation management. Another option is to redirect that funds over to other areas of the business.

MR. RUBENSTEIN: So at no point, if you have funds left over, do you -- is Hydro One going to keep it for its shareholder?

MR. BOWNESS: From the process going forward with the renewed regulatory framework, right, we have the ability to over-earn if we accomplish to the objectives and the outcomes that we have.

So if we get to the point where we're able to deliver on our metrics and our outcomes and we earn some additional funds through productivity improvements, we have the ability to over-earn during the rate filing period and then up to a certain percentage of basis points -- I think it's 100 if I'm going from memory, subject to check -- that anything beyond that is shared with our customers.

MR. RUBENSTEIN: I'd like to move on to the optimal cycle protocol. I think that's the OCP you are speaking of.

MR. BOWNESS: There's a few names for it. But sure, optimal cycle protocol is fine.

MR. RUBENSTEIN: So as I understand it, after the filing of the application, you continued to work with Clear

Path, and you worked with them to come up with a more efficient and better method of vegetation management, correct?

MR. BOWNESS: That's correct.

MR. RUBENSTEIN: And the new approach is reflected in the findings of the Clear Path 2017 report that Mr. Tankersley spoke of -- spoke to on the previous panel, correct?

MR. BOWNESS: Yes, the final report was issued in November of 2017. But we were working with them as we transitioned to this new protocol during the September timeframe. We got into a pilot phase of implementing the new OCP protocol.

MR. RUBENSTEIN: And the first time that you provide this new optimal cycle approach to the Board is in the Exhibit Q update, correct?

MR. BOWNESS: Yes, we provided an official update and change in program approach in November. We were piloting the work during the September and October timeframe. But until we sought Board approval on the overall program, we weren't able to commit to the full transition to the optimal cycle protocol.

MR. RUBENSTEIN: If we turn to page 129 again, this is the section where you start talking about that new proposal over the next couple of pages, and the heading on that page is "changes that do not impact revenue requirement - change in vegetation management strategy". Do you see that?

MR. BOWNESS: Yes, I do.

MR. RUBENSTEIN: So the change in your vegetation management process, the optimal cycle protocol, had no change in the 2018 vegetation management budget that you are requesting, correct?

MR. BOWNESS: So the approach that we took with the optimal cycle protocol was to align -- was to look to target to align the financial costs in line with the as-filed evidence within this proceeding.

If you see within the compendium that you have -- you don't appear to have the additional material, so maybe we could pull it up on the screen. Within SEC.4, it has the additional materials that were shared with the Board and there is a visual there that I'd like to draw upon to speak to how we handle the financials.

Sorry, did you get that one? It's the attachment and it's slide 5 -- sorry, it's attachment 4. There's a number of attachments.

And then if you scroll down to the attachment within this, it's the last page -- keep going, please.

So what you'll see here is that this is the overall financial expenditure within the vegetation management program, and you'll see for 2018 through 2021, the financial numbers. They're rounded off, but the 149.6, which I think we referred to in one of the other exhibits, is the $150 million line item that's flagged in the 2018 column.

What we did in order to achieve this is we made some strategic shifts in the type of work that we would do in

years 1 through 3 versus year 4 and 5.

And that's reflected in the increased red bars, which is our high skilled labour with respect to clearing, and the grey bars, which is with respect to our public safety reliability brush work as we've referred to it.

We're prioritizing doing the cycle clearing work in years 1, 2, and 3 in order to get control of the overall corridors across the entire province, and then we're planning on catching up on some of the brush work that we deferred for on-road brush work out to years 4 and 5, in order to balance to the approximate $150 million of annual expenditure.

MR. RUBENSTEIN: So you introduced a different vegetation management process that has lots of benefits. And yet you didn't go back and say, well, maybe we can change the budget because of this. Maybe there are different things we can do. There's just not a dollar change in the request for 2018, correct?

[Witness panel confers]

MR. BOWNESS: So in an ideal scenario from an asset perspective, we he would have come back to ask for more.

If you look at the brush work that we're deferring to 2021 and 2022, that approximate 10 to $15 million of brush work that we're deferring to those years, we would have executed that in 2018, 2019 and 2020. So the ask for '18, '19 and '20 would have been higher, and then we would have seen that in 2021, the overall program would be more aligned with the 135 million go forward number that you see

in 2023.

However, we looked at this from a cost impact and a rate impact perspective, and we didn't feel that it was appropriate to increase our ask and increase rates that would be paid for by the customers. And rather than that, we balanced it with being able to spread the work over a five-year period.

MR. RUBENSTEIN: And we're talking about OM&A dollars here, correct?

MR. BOWNESS: Yes.

MR. RUBENSTEIN: Was there any change in the capital budget over the next five years because of the new optimal cycle protocol?

MR. BOWNESS: No.

MR. RUBENSTEIN: Now, we had a discussion with Mr. Tankersley and I took him to his report -- sorry, there was discussion -- Mr. Sidlofsky had a conversation with him on Tuesday, and maybe we can just pull up the transcript. This is volume 6, pages 103 and 104.

Could we go down to line 20 on page 103 first? Mr. Sidlofsky says:

> "Thanks, and I apologize, sir, I don't have this in my compendium."

But at the bottom of page 12 of your November 10th report, you state that:

> "Improvements in the tree-related reliability can lead to significant savings in other lines of business. A reduction in the number of outages

results in less straight time and overtime payroll for call-centre staff, trouble man, and line crews. Additionally, there are avoided costs associated with the reduced number of damaged facilities. Do you recall that statement?"

Mr. Tankersley says: "I do." Mr. Sidlofsky then says:

"And based on your experience, I'd like to ask you to describe some typical reductions in damaged facilities, so types of facilities that could be spared as a result of improvements in the tree-related reliability."

And Mr. Tankersley said:

"Well, this is -- you can look at this in two areas, storm events and non-storm events. They both occur. In storm events you have many more occurrences of this happening. In storm events, particularly, as many as 50 percent of all interruptions may be attributed to vegetation. For a more effective vegetation management program you are going to reduce that significantly, and this would be poles down, wires down, everything from a single customer up to a major customer. It is the response time for the trouble and for the line maintenance and construction. I mean, it can impact a lot of different areas."

Do you see that?

MR. BOWNESS: Yes, I do.

MR. RUBENSTEIN: And so do you not agree with Mr. Tankersley that there would be a reduction in storm damage and trouble calls?

MR. BOWNESS: We fully agree with that statement, and maybe we could go back to the cost saving projections that we have in this exhibit that's up right now, if we could just scroll up one page -- sorry, two pages.

If you see within this, you will see the cost-savings line item, and we're anticipating once we get through the optimal cycle protocol through cycle and a half, and Mr. Tankersley spoke to this, is that until we get a significant amount of the territory under -- the defects cleaned up and the territory under control, at that point you will start to see incremental benefit.

What we have done is we've modelled out what we believe that savings is, and we believe it's somewhere between 6- and $12 million in annual savings, but that doesn't kick into that level until we're outside of this five-year window because of the time line to implement OCP and get across the territory.

We have included some benefits as we're ramping up over the next number of years in our productivity goals and objectives, and what will end up happening with those savings as they ramp up from, I think we have a few hundred thousand dollars this year, is that we'll see that our trouble budget will hopefully come down marginally over

this planning period.

What we're talking about, a few hundred thousand dollars in the context of an $80 million line item, so we didn't feel that there was a significant impact on that line item to suggest a budget update, but we are committing down the road to driving the 6 to 12, plus an incremental $20 million in savings starting in 2023.

MR. RUBENSTEIN: Can I turn to you page 137 of the compendium. This is from that same document.

So two things I see. First I see a reduction in SAIDI every year. And I see under the first bullet point you say:

> "Reduced program budgets compared to 2017 OEB-approved budget. A further 20 million reduction starting in 2020 after the strategy has stabilized."

I think that's what you just said. Then I read:

> "Gradual reductions in trouble calls stabilizing in 2023 and resulting in a 6- to $12 million reduction."

So I read that as in of 2023 we could see a 6 to 12 million dollar reduction; is that correct?

MR. BUCKSTAFF: That's what we're looking to achieve, yes.

MR. RUBENSTEIN: Okay. But between the zero, which is now, and the 6- to 12 million in 2023 that just falls outside of this term plan, wouldn't we see a line from zero to 6 to 12 being that gradual reduction in trouble calls

and...

MR. BOWNESS: Yes, and that's the gradual reduction that I spoke to that is starting with a few hundred thousand dollars this year and will gradually increase to $6 million by the 2023 period. However, as Mr. Tankersley spoke to, is that we have a significant number of defects that are within the system, so the first cycle is to clean up the defects that we have, as well as handle the items that are becoming defects, and then as we start into year four and five we really start to get control of the corridors, and that's where we're going to see the more significant improvement in reduction in trouble calls.

MR. RUBENSTEIN: So in 2021, 2022, we'll have an amount of, you expect something less than $6 million, correct?

MR. BOWNESS: That's correct.

MR. RUBENSTEIN: But you have not budgeted that into the -- you have not made an update to the evidence where you have reduced the trouble-call budget, capital budget, for those years?

MR. BOWNESS: No, this is very early days with our OPG OCP program. We're six months into the program. We are seeing some early indicators of positive success, but until we have more of the corridor cleaned up and we see the actual results, we don't think it is prudent at this time to forecast a definitive dollar amount out four to five years.

MR. RUBENSTEIN: Now, we had -- there was a discussion

on panel 1 -- there was a lot of discussion on panel 1 about the capital plan being brought to the board of directors with -- originally with a Plan A recommendation, and they sent it back, and you ended up with a Plan B modified; do you recall those discussions? I'm not sure if you generally refer to them.

MS. BRADLEY: Yes.

MR. RUBENSTEIN: And if we turn to page 145, as I understood at least at the time that it went to the board of directors -- you see this starting at paragraph 6 -- as I understand, it was a rates increase in 2018 of 5.4 percent, correct?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: And what Plan B did is -- was:

> "It was developed that would maintain overall forecast system reliability at current levels while continuing to offer discrete power quality reliability improvements for certain segments of the network."

Do you see that?

MS. BRADLEY: Yes, I see that.

MR. RUBENSTEIN: So I took it that the board of directors approved a plan that would essentially maintain overall forecast system reliability at current levels while continuing to offer discrete power quality and reliability improvements to certain segments of the network. That was how they landed on a plan and why they supported Plan B modified. That got them the rate increase that, in their

view, was reasonable.

MS. BRADLEY: The discussions that we had with the board and that are documented in the board documents in the application or in the undertakings talk about the condition of assets and maintaining the condition of assets with Plan B modified. It does talk about maintaining reliability and considering the rate impact to customers, yes, but maintaining the condition of our fleet and not enabling it to deteriorate is a factor as well as the reliability impact.

MR. RUBENSTEIN: And the reliability, the sort of zero system impact, was based on the table -- Table 4 on page 145 of the compendium and Table 5 on page 146. That's how you got to it, and that's -- you see those tables also in the materials to the board of directors, correct?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: And you've provided a breakdown of how you calculated those percentages in the programs, and I've included some of that at page 147 through 149, correct? That's what this is supposed to show, you were explaining?

MS. BRADLEY: Correct.

MR. RUBENSTEIN: Okay. I want to just make sure I understand the table.

So if we can go -- if we could look at the table, looking at SAIDI at page 145, it says:

> "Vegetation management outages contribute 27 percent to SAIDI on average between 2013 and

2015."

Do I have that?

MR. JESUS: That's correct, the tables have been -- that's correct, the tables have been updated as per the Energy Probe I-18-0-17 and submitted today as part of the undertaking with all the recent updated numbers.

MR. RUBENSTEIN: No, I understand, I just want to -- these were the ones that went to your board of directors. I just want to use these for the purpose of the discussion. We'll get to the Energy Probe one after.

But am I correct, when we talk about vegetation management outages, that's tree contact outages, correct?

MR. JESUS: That's correct.

MR. RUBENSTEIN: And it says the SAIDI average of 7 -- and the total SAIDI average is 7.3 hours, correct? Do you see that at the top? It excludes force majeure and loss of --

MR. JESUS: That's correct.

MR. RUBENSTEIN: And then the vegetation management portion is 1.8 hours, correct?

MR. JESUS: That's correct.

MR. RUBENSTEIN: Would you agree with me that 27 percent of 7.3 is not 1.8?

[Witness panel confers]

MS. GARZOUZI: Can you repeat your question?

MR. RUBENSTEIN: You would agree with me that 27 per cent of 7.3 is not 1.8?

MS. GARZOUZI: That's correct.

MR. RUBENSTEIN: Twenty-seven per cent of 7.3 is about 1.97; do I have that right?

MS. GARZOUZI: That's right.

MR. RUBENSTEIN: And I'd ask you if we could bring up -- if we could have this brought up since I accidentally did not include it in my compendium, if we can bring up 24 AMPCO 13.

If we can go to slide 13 -- sorry, my apologies. If we can move to table 13, that's on page 5. So this was taking a look at the average between 2013 and 2015, the table 4 on the original -- on page 145, correct?

MR. JESUS: Yes, that's correct.

MR. RUBENSTEIN: And if we look at tree contacts between 2013 and 2015, you'd agree with me that the average is higher than 1.8? That is located in table 4.

MR. JESUS: That's correct, except the table -- the table that you keep referring to excludes loss of supply entirely. So the line item as shown in table 3 does have a loss of supply, so when you include the loss of supply, all the numbers come down by about -- loss of supply contributes by approximately 5 per cent.

So the tables referred to exclude loss of supply entirely, which would bring up the percentages. So it's not -- you're not comparing like for like in that particular example.

MR. RUBENSTEIN: I'm not sure I understand. I understand that table 4 doesn't include loss of supply. This is from the materials you provided to the Board in the

pre-filed evidence.

MR. JESUS: So table 13 shows a line item. You can see that line item as loss of supply, and that's about .43.

In the tree contacts of 2.98, that is true. That is a contribution due to tree contacts, but there may be a portion associated with the loss of supply, if you will.

But at the end of the day, these tree contacts -- this table that you have in front of us excludes FM, but the loss of supply line item is shown explicitly.

MR. RUBENSTEIN: I don't understand. Loss of supply is its own category?

MR. JESUS: That's correct.

MR. RUBENSTEIN: So it is in the tree contacts. It is in its own category.

MR. JESUS: That's correct.

MR. RUBENSTEIN: So if I look at just tree contacts and both tables exclude force majeure, your tree -- the average I get is 2.08 over those three years, not the 1.8.

MR. NETTLETON: Mr. Rubenstein, I thought we established with the witnesses that the 1.8 was an incorrect error, it was made in error.

The 27 per cent of the 7.3, I thought you said was 1.9.

MR. RUBENSTEIN: So I was --

MR. NETTLETON: You kept referring back to the 1.8, so I'm just wanting to make sure what you are referring to.

MR. RUBENSTEIN: No, but if we take 27 per cent of the 7.3, we get 1.94. And that's also not the same as the

difference between 2013 and 2015 average.

There are two errors, or at least two different things that are both wrong.

MR. JESUS: So as I tried to indicate previously, Mr. Rubenstein, we want -- the table has been updated in Energy Probe 17. So we should be focused in on the correct numbers that are shown there, and those numbers are different from the tables that you are showing in tables -- the attached tables that you are referring to.

MR. RUBENSTEIN: No, I understand. But I want to -- I'm trying to -- this is what you showed to your board of directors, correct, the tables 4 and 5?

MR. JESUS: That's correct.

MR. RUBENSTEIN: So understanding that there is an error in that table seems to be different, because that's what they had in their materials, correct?

MR. JESUS: That's correct.

MR. RUBENSTEIN: And if you understate the SAIDI contribution in tables 4 and 5, would you agree with -- would that have a positive or a negative impact on the total SAIDI at the end, changes in SAIDI.

If the SAIDI contribution was correct and it was higher than 1.8, would that have changed the overall for plan B estimated impact to SAIDI in a positive or negative direction?

MR. JESUS: So the overall impact of tree contacts, excluding force majeure over the last five years, without FM, without loss of supply, is actually 25 per cent of the

contribution. So right now, we're showing 27 and that's over the period 2013 over to '17, correct?

So over that period of time, the tree contacts represent roughly 25 per cent of the related outages contributing to SAIFI, and 47 per cent contributing to SAIDI.

So if we were to include 47 per cent in that number from tree contacts alone, it would drive up the number significantly.

MR. RUBENSTEIN: The impacts -- sorry, is it -- the overall reliability will increase or decrease?

MR. JESUS: If we were to put from a SAIDI point of view, the contributions due to tree contacts, the overall reliability would improve.

MR. RUBENSTEIN: All right. So if you had provided what I would posit to you is a corrected version of this table to your board of directors, it would have shown that the work plan that you are proposing would have had a better -- would have not a zero impact, but a positive impact on SAIDI and SAIFI; is that correct?

MS. BRADLEY: Mr. Rubenstein, I don't see in our material for our board of directors -- when we talk about plan A, plan B, even plan B modified, there wasn't a lot of focus. We weren't talking about, say, our new vegetation management program. So the numbers would have stayed flat across the board; in plan A, B, and B modified, they stay flat.

So it wasn't a significant differentiator in the

different plans that we were proposing. If that upfront number, the contribution to SAIDI number changes, it changes the outcome for all plan scenarios.

MR. RUBENSTEIN: Yes, and I'm just trying to understand if we put the proper SAIDI contributions in -- that's not the 1.8, and we don't change anything else, is that going to show, with respect to plan B modified, an increase compared to the zero per cent in reliability or a decrease in reliability?

MR. JESUS: So can we turn to I18, Energy Probe 17, to see the exact, what the -- because we would put the correct number there.

So in Energy Probe 17, in I18 Energy Probe 17, the correct number for vegetation-related outages over the period '13 to '16 was approximately 7,000 outages per year, and it contributed to SAIDI 31 per cent.

MR. RUBENSTEIN: No, I understand. But you're showing me the update is -- because it updates 2013 to 2016 information; we have better information.

I'm more interested -- sorry, I'm interested in what you showed the board of directors because I want to understand, at that point in time, what the difference would have made. We're going to get to talk about Energy Probe's --

MR. BOWNESS: Sorry, if we could just bring this back. So with the corrected numbers, the estimated impact to SAIDI between plan A, B, C and B modified, if you look at those numbers at 6 per cent, 3 per cent, negative 2 and 2.

Even with the numbers presented to the board in the other exhibit, it was 6 per cent, 3 per cent, negative 2 and zero. So yes, there was a slight change with respect to the plan B modified that the -- to the positive, is that in plan B modified, there is an improvement to SAIDI based on the updated numbers.

But the delta between A, B and C is unchanged, and it's a very small percentage change in B modified.

MR. JESUS: Agreed.

MR. RUBENSTEIN: Focusing on 2013 and 2015, I'm going to ask this one more time. Instead of 1.8, the contributions were either 1.94 based on what is 27 per cent, a corrected version of 27 per cent of 7.3, or it's the data that I took you to in AMPCO 13 and that impact on SAIDI contributions is an average of 2.08.

Is that -- would that have, based on your table and your numbers, would that zero per cent for estimated impact to SAIDI be a positive number or negative number, or would stay the same? That's my question.

[Witness panel confers]

MR. BOWNESS: So just the summary of our discussion is that, you know, vegetation management didn't have any impact on any change in the estimated impact to SAIDI. If you look at the exhibit with the updated numbers, other items within the plan changed it positively by 2 percent, but vegetation management being off 1.8 versus 1.97, it would have affected all four plans the same way, because there were no changes to vegetation management between the

plans.

MR. RUBENSTEIN: I accept that. But I'm just asking about Plan B modified. I understand they may all go up or they may all go down, but which direction is it going to have that effect, up or down, positive or negative? Would you agree with me that would have a positive impact if what I would say is the correct SAIDI contribution, it would have shown the board that your plan would have had positive reliability impacts instead of zero.

MR. JESUS: So I guess maybe we need to understand how we're arriving at the changes in the SAIDI. And the way this works is you are taking each one of those planned percentages that you see there, multiplying it by the contribution, so the differences between the Plan A, B, C, and B modified, based on what's included in each of those investment plans for each of those plans, so for Plan A, the pole improvement would be 12 percent, for Plan B the improvement would be 9 percent, for Plan C it would degrade by 19 percent, and Plan B modified it would improve by 7 percent.

So what we did is we looked at all the outages associated with poles, stations, outlying components, and vegetation management, and we multiply the contribution by the improvement for each one of those categories, so you take the 12 percent times the .5, the 9 percent times the .2, the 10 percent multiplied by 1.6, and 8 percent times 2-point -- whatever the number is, 2.3, the contribution, to arrive at what the estimated impact to SAIDI is.

So in that particular example, the table that you have in front of you, the impact is 6 percent. And we ran the numbers and we submitted the undertaking this morning, that was provided again with complete math that we've provided. The number ends up at being 7. So even with the new tables, the original tables provided to the board show 6.9, the updated tables as of this morning are showing 7, so minuscule changes are being shown using the corrected math based on the latest and greatest information.

MR. RUBENSTEIN: Can I ask you now, if we go -- and I think you mentioned this -- we look at page 149, this is the -- how you got the vegetation management in both the Energy Probe interrogatory and Table 4 and 5, and this is based on the prefiled method approach? Is that fair? It's -- you have not updated this for the optimal cycle approach, correct?

MR. JESUS: These tables --

MR. RUBENSTEIN: Yes.

MR. JESUS: -- have not been updated -- these tables have not been updated with the revised optimal cycle; that's correct.

MR. RUBENSTEIN: All right, and if we can turn to page -- I'm sorry, I've got two things handy. First if we have AMPCO 13 handy. And if we could have the information on page 137 of the compendium handy.

In Energy Probe -- sorry, a few things handy here. If I looked at -- from the evidence that you talk about in the filing of the new information -- or the model, you have for

vegetation management from 2013 to 2016 the SAIDI contributions of 2.3; is that correct?

MR. JESUS: That's correct.

MR. RUBENSTEIN: And if we go to page 137, so this shows the forecast changes you expect over time, correct?

MR. BOWNESS: Yes, that's correct.

MR. RUBENSTEIN: And what I see is for 2022, which is how you were doing your Table 4 and 5 in the Energy Probe table, you expect to be at 1.39, correct?

MR. BOWNESS: With respect to tree-related SAIDI.

MR. RUBENSTEIN: And that's the same as the 2.3 we were talking about in the table, correct?

MS. GARZOUZI: Yeah, so on that graph that you're looking at, that black line shows the ten-year average, that's correct, and there's two dotted lines, so the lower one is the 40 percent improvement and the higher one, the 1.84, moving down to -- you know, it's way down -- is the 40 percent -- is the 20 percent, so that's the band in which we expect improvement.

MR. RUBENSTEIN: Okay. Well, let's use the 40 percent as an example, correct? And what I'm seeing here -- and well -- I mean, you're -- sorry, the black line -- the black bar is the individual year, that's...

MR. BOWNESS: No, the black bar is the ten-year average.

MR. RUBENSTEIN: Sorry, I'm not talking about -- the vertical line --

MR. BOWNESS: Oh, sorry.

MR. RUBENSTEIN: -- the vertical black line is the individual years, correct?

MR. BOWNESS: The vertical blue line on the display, yes.

MR. RUBENSTEIN: Okay. So let's look at 2022. I see you're forecasting a 1.39.

MR. BOWNESS: Based on a 40 percent improvement, yes.

MR. RUBENSTEIN: Okay. And so if we were at 2.3 now and you expect to be at 1.39, forecasting that on a 40 percent improvement in 2022, you would agree with me that would be -- or would you take it subject to check --

MR. BOWNESS: 2.3 at 60 percent is 1.38, so that's how we're getting to that rough number.

MR. RUBENSTEIN: It's about a 39.6 --

MR. BOWNESS: Rounded off, yes.

MR. RUBENSTEIN: -- it's a 40 percent increase, and if we look at the SAIFI numbers that would be -- I understand from Energy Probe 17 it's about 0.47 is -- sorry, 0.51 is the -- or 0.5, I think, but it's -- 0.5 is what you have is the 2013 to 2016 number, correct?

MR. BOWNESS: The red line on the display as well as the ten-year average of SAIFI.

MR. RUBENSTEIN: Just on SAIFI, my understanding is in the Energy Probe interrogatory your forecast -- you -- the base forecast is 0.5. That's the number in the table.

MR. BOWNESS: Sorry, which line item are you pointing to? Can you --

MR. RUBENSTEIN: Maybe the best thing is if we could

just pull up the Energy Probe interrogatory or best maybe pull up Undertaking 6.1 that was filed today which has the Excel spreadsheet. If we can just see it there.

It's my last area.

And let's move to part C. So these are the two tables, correct? This is the tables from the Energy Probe interrogatory, correct?

MR. JESUS: Yes, that's correct.

MR. RUBENSTEIN: Okay. So if we go down to SAIFI --

MR. BOWNESS: Yes, that's correct.

MR. RUBENSTEIN: -- the base is 0.5. That's the 2013 to 2016 average, correct? Vegetation management, contributions to SAIFI?

MS. BRADLEY: That's correct.

MR. BOWNESS: Yes.

MR. RUBENSTEIN: And if we go back to page 137 of the compendium, I'm eyeballing that you are forecasting by 2022 about half of that.

MR. BOWNESS: We're targeting a similar percentage improvement on SAIFI as we are on SAIDI.

MR. RUBENSTEIN: So 40 percent?

MR. BOWNESS: Yeah, 20 to 40 percent.

MR. RUBENSTEIN: Okay. So let's go back to that Excel spreadsheet. Do you see H -- I'm sorry, H25, the 8 percent? That's on the old method, the improvement, right?

MR. JESUS: Correct.

MR. RUBENSTEIN: Let's change that to 40 percent,

because that's what you forecast. Can we do that?

MR. BOWNESS: Sorry, change it to?

MR. RUBENSTEIN: Forty percent, that's the 40 percent improvement you are forecasting in 2022.

MR. JESUS: Maybe to help out...

MR. RUBENSTEIN: Sorry, can we change the number in H25 from 8 to 40? Change that to 40.

MR. JESUS: 0.4.

MR. BOWNESS: Change it to 0.4. And you would have to do that in plan A and B as well.

MR. RUBENSTEIN: You can just type it in right there. I recognize that. I just want to understand the effects of modified B.

So now the impact in SAIFI is going to be 7 percent, not the zero percent before the board of directors or the 2 percent on the updated number. Using this model, your own reliability model, you think the SAAIFI is going to be 7 percent, correct?

MR. BOWNESS: With our vegetation management strategy, we have a very significant targeted improvement on SAIFI and SAIDI with respect to the vegetation management program. And if you look at how we've positioned the updated scorecard, it is one of the drivers as to why we are targeting to have improved reliability over the five-year period.

MR. RUBENSTEIN: Can we move up that table to do the exact same thing with respect to the SAIDI?

MR. JESUS: Again, there is an updated undertaking

that was submitted this morning that can take you exactly what the improvement is going to be in J1.1.

MR. RUBENSTEIN: This is an undertaking.

MR. JESUS: This is the Energy Probe. The one we're talking about is the one that we submitted with the rural and the urban updates in J1.11.

MR. RUBENSTEIN: Let's just focus on this. Can we change H10 from 8 percent to 40 percent? So now we're going to have a -- based on the plan B modified you are proposing, SAIDI is going to improve by not the zero percent that you provided to your board, or the updated number of 2 percent; it's going to be -- you're forecasting 12 percent, correct?

MR. BOWNESS: And this would similarly have impacted plan A and plan B, because there were no changes to any of those plans either during the board update. So if we're changing one cell in the spreadsheet, I want to make sure we're comparing apples to apples.

MR. RUBENSTEIN: I just want to compare how the -- as the change to the cycle, how that just changed the plan B modified, which is what your proposal is, correct, the plan B modified which you're seeking approval for?

[Witness panel confers]

MR. BOWNESS: Sorry, can you repeat the question?

MR. RUBENSTEIN: It is plan B modified you are seeking approval for in this proceeding? That's the capital plan that underlies this application?

MR. BOWNESS: From a total capital envelope

perspective and a total OM&A, yes. But there is a significant change in the strategy with veg management as compared to the as-filed, which was the update in Exhibit Q.

Sorry, as compared to the pre-filed evidence, and we provided that update in Exhibit Q.

MS. BRADLEY: The one thing I would add is this is exactly the direction that we took from the OEB's last decision, where they told us to work to get better outcomes without requiring significantly more money.

MR. RUBENSTEIN: My question is this: When you went back to your board of directors showing them the optimal cycle plan, did you not show them as well that actually this is going to have this type of an increase on the overall reliability that underlies this application?

[Witness panel confers]

MR. BOWNESS: So the board of directors is a aware of the impacts of the vegetation management strategy on our reliability outcomes, one through the vegetation management presentation that we're looking at right now, but also through the updated targets that we have within our team scorecard as a part of our corporate performance management processes.

Did we go back and update the entire application and every table and every evidence based on this? No, we updated macro-ly with respect to -- we are able to keep costs in line with what was submitted, with a long term goal of $30 million of savings within our vegetation

management strategy, with driving a 20 to 40 percent improvement in reliability.

MR. RUBENSTEIN: If the goal from the board of directors improving plan B modified was essentially to have the rate increase that maintains overall forecast system reliability at current levels while continuing to offer discrete power quality and reliability improvements for certain segments of the network. And based one the updated numbers, that's going to have a significant increase in reliability based on that, isn't there now room to adjust the capital program to say we can even do -- we can get more than they originally sought, but we have an ability now to make changes to the overall capital plan to decrease it to lower the initial and ongoing rate impacts?

MR. BOWNESS: So I think if you look historically, the perspective was that the amount of dollars that would need to be expended in order to improve reliability was substantial and beyond what customers could afford.

We put forward an asset plan that had a capital envelope that was maintaining reliability. Subsequent to that, we came up with a new strategy on one work stream, on veg management, where we were able to really challenge ourselves to drive improved reliability for the same cost.

And that's what our board of directors heard through the vegetation management update, and was very pleased that within the same financial envelope, we were able to drive an improved outcome.

MR. RUBENSTEIN: Why isn't it fair for this Board to

take from this updated evidence and say, well, originally we were going to get -- for a certain rate impact, we were going to have zero system impact. Now with this one change, we're seeing SAIDI going from the zero percent that was before your board of directors, to a 12 percent increase, and SAIFI from a zero to 7 percent increase, why can't there be something in the middle? A lower rate impact adjusted capital plan and still some increase in SAIDI and SAIFI? Why isn't that an appropriate approach that the Board should take in reviewing this application?

MS. BRADLEY: In my view, that wouldn't meet the objectives of the renewed regulatory framework where customer focus, operational effectiveness, which includes continuous improvement in productivity and cost performance and delivering on system reliability and quality, public policy responsiveness and financial performance which includes financial viability and sustainable savings from operational effectiveness, the renewed regulatory framework encompasses all of that.

And having a degrading system that's going to impact future generations, in my view, doesn't meet what we've been asked to do in the renewed regulatory framework.

MR. RUBENSTEIN: I wasn't saying the Board should approve a plan that has a negative reliability. I'm saying now it appears to be that we have some leeway for the Board to say, well, we can make some potential optimized or reduction in the capital plan to lower the rate increases for customers, and they can still get reliability

improvements.

That's a better deal than the original application you filed.

MS. BRADLEY: But, Mr. Rubenstein, the plan that we've put forward, the capital plan is geared to not enabling our capital base or our assets to deteriorate. The vegetation management program is not renewing our pole population, it is not renewing our stations population. The capital investments that are currently in the plan are required to maintain and prevent further deterioration of those assets.

The vegetation management program, unfortunately, isn't going to renew those assets.

MR. RUBENSTEIN: Thank you very much. Those are my questions.

MR. QUESNELLE: Thank you, Mr. Rubenstein. Mr. Stephenson?

CROSS-EXAMINATION BY MR. STEPHENSON:

MR. STEPHENSON: Thank you, Mr. Chairman, thank you, panel. My name is Richard Stevenson, and I'm counsel for the Power Workers' Union.

I just want to pick up on an issue that you were just dealing with Mr. Rubenstein about, and this is regarding this vegetation management issue and could you do it in a way where you spent less money and got some, but not all of the reliability improvement.

As I understand it, the key objective of your new vegetation management strategy -- obviously, the ultimate objective is about cost and reliability, correct? Those

are the key ultimate outputs, fair?

MR. BOWNESS: There are three main drivers, making sure we're maintaining a safe environment with respect to electrical hazards and trees, making sure that we have a reliable system and that we're doing it cost-effectively.

MR. STEPHENSON: Fair enough. One of the means by which you achieve those outcomes is to reduce the cycle, right? That's a critical component, correct?

MR. BOWNESS: Reducing the cycle and changing the approach dramatically to dead, diseased, to dying, decadent trees.

MR. STEPHENSON: The change in approach gets you the cycle, but I view that as a means by which you decrease the cycle.

MR. BOWNESS: Yeah, they are definitely intertwined.

MR. STEPHENSON: So if you are spending less money on your new program, aren't you -- there is a very serious risk that you are not actually going to achieve the desired outcome or what -- a critical part of the outcome, which is to get back on -- to get on a new cycle. I mean, you have to devote a certain amount of resources to break through from your old practice and your old cycle to a new cycle; isn't that fair?

MR. BOWNESS: Yes, a couple of drivers. One is to clean up the backlog of defects and getting control of the overall territory, but the other piece that I think is really important is that this is an optimal -- an optimal targeted approach. It is not just a shorter. So if you

could just bear with me to pull up one of the exhibits from Mr. Tankersley report, where I would just like to make sure that people understand the impact of growth in the three- to four-year period.

So if we could pull up Exhibit Q within the -- let me just make I've got this. So within Exhibit Q-1-1, attachment 2. And it's page -- it's figure 6 on page 9. One more page, sorry.

You will see -- what this picture is showing is that this is the number of defects that we see since the circuit was last cleared, and you will see that there is a significant uptick between years three and four, so we believe that if, on average, right, if we deferred work and if we lengthened to the fourth year we would have a -- you know, there is a 35 percent increase in the number of tree contacts that occur between three and four. So this is one of the main drivers we have for picking a three-year cycle.

The other piece is that we have to get around the territory. We haven't been to certain areas of our territory in eight, nine, ten years, and we want to get around over a three-year cycle to get there once in the next three years to each feeder, and then we're going to reassess what's optimal going forward.

So Mr. Tankersley spoke to tree growth and species and zones and such. We are capturing all this information over the next three-year period so that we can set the optimal cycle for each of the circuits going forward.

MR. STEPHENSON: I'm going to move to a different

subject. I'm going to spend most of my time in this examination talking about my favourite subject, which is pole replacements.

First off, I just want to get some nomenclature straight. Sometimes in your evidence when you are referring to asset condition on poles, you use expressions like "poor" and "very poor", and at other times you use the term "high-risk", and I just want to make sure that I understand.

It seems to me you use those terms interchangeably, but if they actually mean something different it's important for me to know that.

MS. GARZOUZI: Yes, they are the same.

MR. STEPHENSON: Okay. And so, yeah, you say you've got X number that are high-risk, in some places you say X number that are poor. That's just a -- those are synonymous. Okay. Good. So --

MR. JESUS: Yeah, just to be clear, poles that are in poor condition have a higher risk of failure, so the high risk comes into poles with poor condition are associated with higher risk of failure.

MR. STEPHENSON: I understand that. I'm actually just -- and logically, no one denies that, but when you use those terms you are talking about the same -- very same cohort.

MS. GARZOUZI: So --

MR. QUESNELLE: Could I just interject on something?

MS. GARZOUZI: I'd like to correct too --

MR. QUESNELLE: Yes, please.

MS. GARZOUZI: When I -- okay. So risk is probability times consequence. When we talk about condition we are actually talking about the probability of failure. When we talk about the consequence, so consider a pole that's supplying, let's say, 10,000 customers versus 200 customers, the risky element is the multiplication of the two.

So let's separate condition from the probability. So I want to correct what I just said when I said they're the same. They're not. They're correlated, but one is one access, one is the other. So probability times consequence.

MR. QUESNELLE: Thank you.

MR. STEPHENSON: Can I get you to turn up -- this is part of the distribution system plan. It's something called ISDSRO9, page 1 of 5. This is your pole replacement program --

MS. GARZOUZI: That's right.

MR. STEPHENSON: -- SRO9. SRO9, yes. Third paragraph. You say:

> "As outlined in DSP Exhibit 2.3, there are currently 67,000 poles in poor condition that are at high risk of failure. At the end of 2022 it is forecasted that an additional 77,000 poles will be added to this high-risk category due to deteriorating condition."

Reading that paragraph, "poor condition" and "high-

risk category" appear to be being used synonymously.

MS. GARZOUZI: Yes.

MR. STEPHENSON: Okay, and so if we could then just go to -- it's AMPCO 23, Exhibit I, tab 24, AMPCO 23, which is your -- there was a great big spreadsheet with asset condition on it. I'm sure you are familiar with this document.

MS. GARZOUZI: Yes.

MR. STEPHENSON: And I'm looking at attachment 1. And in this document, sort of at the bottom third of the page, there's a section of dealing with poles. Do you see that? It sets out conditions.

MS. GARZOUZI: Yes.

MR. STEPHENSON: You see that. Okay. And, you know, it's got condition in 2014, '15, and so forth. And the descriptor, if you go to the asset category, the columns are poor, fair, and good. Do you see that?

MS. GARZOUZI: Yes.

MR. STEPHENSON: Okay, but again, that -- when you use the word "poor" in that column, you mean the same thing as "high risk" when you talk about 67,000 poles at high risk. Correct?

[Witness panel confers]

MR. STEPHENSON: The math works out, just so you know, if you do 4 percent, 1.6 million poles, you are getting a number in the 65,000 range.

MS. GARZOUZI: We can separate high-risk and then high risk of failure, so in that context it is about high risk

of failure due to the poor condition, so that's correct.

MR. STEPHENSON: Okay.

MS. ANDERSON: Mr. Stephenson, just a quick question. My notes from earlier today say that there were 100,000 poles that were poor. I don't know if that's an error in my notes, but was that just a rounding up?

MS. GARZOUZI: No, it is 106,000 --

MR. STEPHENSON: Yeah.

MS. GARZOUZI: -- so it is the 67,000 have failed based on testing and there is 39,000 that were discussed in previous applications that are the untreated wood poles, so the red pine issue that we uncovered, so it is the sum of both are in poor condition.

MS. ANDERSON: Okay. Good. Thanks.

MR. STEPHENSON: And just to deal with the red pine once and for all, just on that, and I know --

MS. GARZOUZI: It's in that --

MR. STEPHENSON: -- they're listed on this chart as well --

MS. GARZOUZI: If you go to AMPCO 23, so the line that you were just at, "wood" --

MR. STEPHENSON: Yeah.

MS. GARZOUZI: -- is that number that we were just talking about. If you just go a bit lower, the red pine pole that's shown, so that's the 39,000.

MR. STEPHENSON: I got it.

MS. GARZOUZI: Okay.

MR. STEPHENSON: And the issue there -- and I'm going

to talk about demographics in a moment, but the red pine is a real exception to the nexus between asset condition and demographics, right? These poles aren't very old in the scheme of things?

MS. GARZOUZI: That's right.

MR. STEPHENSON: But they are in various degrees of poor condition, fair?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: All right. They all are poor, some are worse than others?

MS. GARZOUZI: The red pine issue, let's separate it from the population. So the red pine, the entire population, is deemed poor. So 39,000, that subset is a subset of our entire population of wood, so the entire population is equally poor.

MR. STEPHENSON: Okay. But you have here actually segregated them by risk on AMPCO 23.

MS. GARZOUZI: Okay. So let's separate red pine from the rest of the population. For the red pine issue, we had a third-party assessment two filings ago. There was a report that was filed and -- from the expert that was retained. They told us that the expected service life of that population was 25 years.

And so what we've done here is we've put them into categories based on their age, because we know the age. So the entire population does not meet CSA standard. However, they are tagged as they get older, they move towards the condition.

For the 67,000 poles, they have all failed tests so age is not part of the rest. So the 67,000 is separate from the 39,000.

MR. STEPHENSON: Okay. And again, when it comes to the condition, your labels, one of the -- labelling something as being in poor condition from Hydro One's perspective means that it requires replacement in the next five years, right? That is a consequence -- or that's how you define poor condition, right?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: So the problem that Hydro One has is that it's got 67,000 that have failed, and therefore are poor. And then it's got this red pine cohort, which is just galloping towards poor condition, if they're not already there.

But that's just a snapshot in time, right? You will have new poles which become newly in poor condition every year because they have degraded by the passage of time, correct?

MS. GARZOUZI: That's correct. We tend to find about 9,000 poles in poor condition annually as of year of testing.

MR. STEPHENSON: Right, and I just wanted to ask you about that, because we asked you that question. We asked you how many are newly going to be in poor condition for the purpose of -- for the duration of the application. And you gave us an answer to that -- bear with me.

MS. GARZOUZI: I29, PWU11. The question here was how

many poles did Hydro One forecast as newly becoming in need of replacement.

MR. STEPHENSON: Yes.

MS. GARZOUZI: So we projected, based on our historical condition assessments, what we would find over the filing period.

MR. STEPHENSON: Right, and the number isn't 9; it's 13,400, right, per year? That's the answer to interrogatory 11.

MS. GARZOUZI: Yes, that's the answer.

MR. STEPHENSON: And I take it you have no reason to quarrel with that?

MS. GARZOUZI: No, there's two things. There's expected service life and then there is condition testing. So I just want to distinguish that we replace things based on condition tests that have failed.

MR. STEPHENSON: But I mean, by definition, you are predicting here, because of course you can't -- you are going to do the testing three years from now, or four years from now.

MS. GARZOUZI: Yes, so it's a hypothetical number.

MR. STEPHENSON: So we've already got this cohort of more than 67,000 poles that need to be replaced in the next five years, right? That's a point in time measure?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: Then you are forecasting an additional 13,000 a year that will newly become in need of replacement within five years, right?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: Okay. So that's your challenge if you're focusing on your immediate replacement needs, right? That's your pole replacement program; that's what you have to manage?

MS. GARZOUZI: Can you repeat your question, please?

MR. STEPHENSON: Right, okay. If we're looking at what you actually have to manage in terms of your pole replacement program, we know that there is a number in excess of 67,000 right off the bat, correct?

MS. GARZOUZI: Correct.

MR. STEPHENSON: It is the 67 plus some proportion of the red pine.

MS. GARZOUZI: Thirty-nine, plus what you find every year.

MR. STEPHENSON: Plus the 13.4 coming in every year.

MS. GARZOUZI: And then you are looking at a five-year window and you are shifting in time, so keep that in mind, right, so you're --

MR. STEPHENSON: I understand. But the 13,400 poles that go bad on you in year 1, right, you are not going to wait around until the end of year 5 to deal with those. That's a very risky strategy, right?

MS. GARZOUZI: We don't like to maintain assets that we know are in poor condition and at risk of failing.

Ideally, a planner's dream is replace the asset just before it fails. The minute before would the optimal time.

MR. STEPHENSON: In addition, here we're not talking

at all about all of the other poles that fail. You have a whole other gang of poles that fail over the year, for reasons that are unrelated to their obviously poor condition.

These are ones that fall down in storms or they get hit by trucks, whatever. There is a whole whack of them that don't fail because of obviously poor condition, right?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: And in fact, you do about 12,000 poles a year, outside of your pole replacement plan?

MS. GARZOUZI: Yes.

MR. STEPHENSON: And some of those will be poles that are in poor condition, and would have been replaced as part of your pole replacement plan, but they fell down before you got to them, right?

MS. GARZOUZI: Yes.

MR. STEPHENSON: And a whole other bunch of them have nothing to do with this category at all, right?

MS. GARZOUZI: That's right.

MR. STEPHENSON: They're young. They just happen to be unlucky, right? That's what the 12,000 is mostly about, right?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: Okay.

MR. QUESNELLE: Mr. Stephenson, I don't want to cut you off right in the middle of the question, but we'd like to take a break shortly if there's a decent spot.

MR. STEPHENSON: This is perfect, thank you.

MS. ANDERSON: Just before -- sorry, you didn't turn us off yet. Before you leave, I guess I would like to make sure, is it the 9,000 or the 13,400 that are poles that become poor during the period. And you can maybe come back with that after the break. I just want to make sure which number we're using. It's just the 67,000 divided by five years gives you 13,400 poles, but that's the same -- is that the same 67,000 that are currently poor, I guess.

MS. GARZOUZI: I have 9,000, but let me check at the break and I'll give you the number.

MR. QUESNELLE: Okay, we'll return at 3:20.

--- Recess taken at 3:04 p.m.

--- On resuming at 3:24 p.m.

MR. QUESNELLE: Mr. Stephenson, resume when you're ready.

MR. STEPHENSON: Why don't we start with the outstanding question, if you've got an answer.

MR. QUESNELLE: Thanks for the reminder. Yes, let's do that.

MS. GARZOUZI: So in the ISD, so SR09, we describe how many poles we'll be replacing, so we show the 67,000 poles. We talk about the 39,000 poles that are red pine, and then here we talk about, we're forecasting that we'll find an additional 77,000 poles that would be added to the high-risk category.

At that point in time that was based on an assumption of finding 9,000 poles in poor condition per year. Since then the trend has increased based on our condition

testing, and so now it is closer to 34,400 (sic). That's a forecasted trend based on what we're finding.

MS. ANDERSON: Sorry, you said 34,000?

MS. GARZOUZI: 13,400. It is a strange coincidence that the numbers are matching here.

MS. GARZOUZI: Also, if I may add, so if -- you know, adding up those numbers, this means that, you know, despite the high-volume of wood poles being proposed for replacement over the planning period, we are not really keeping up with the maintenance of the population, so we're maintaining the population, or it would be deteriorating based on what we're finding, if the trend continued.

MR. STEPHENSON: And just to be clear, the coincidence in the numbers is the 67,000 number; that is, your current cohort of 67,000 and the five-year new cohort also turns out to be coincidentally the same number.

MS. GARZOUZI: Yeah, and I and want to add the 39,000 poles, I just want to make sure that they are in the number of poles that need to be addressed, because the expected service life is 25, unlike the other poles that are 62.

MR. STEPHENSON: Viewed through one lens, you are making positive progress with respect to your population of poles over the course of this application, and specifically what I'm referring to is that if you take your high-risk or poor-condition number, currently you're at 106, right?

MS. GARZOUZI: That's right.

MR. STEPHENSON: And you are forecasting to actually reduce that number to 99 by -- 99,000 by the end of the

application, right?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: And so --

MS. GARZOUZI: But again, there is a hypothetical element here, which is the replacement rate that you're finding, so depending on the points in time, our projected number would then shift our forecast. It would be slightly improving or slightly deteriorating based on what we find.

MR. STEPHENSON: All right. And I'm going to suggest to you that directionally it is probable that the number of poles that are newly in poor condition each year is going to be trending upward. You'd agree with me about that?

MS. GARZOUZI: I think due to the aging demographic it's reasonable to assume that the trend will slightly increase.

MR. STEPHENSON: And there is a strong correlation between your demographics and pole condition, correct?

MS. GARZOUZI: Yeah, so the expected service life is the population view and the failure rate analysis on that population, so there is a correlation between age and failure rate.

MR. STEPHENSON: Well, if we looked at your 67,000 poles currently in poor condition, again, excluding the red pine, that population would be very substantially disproportionately skewed toward poles that are at or after the end of their service life, correct?

MS. GARZOUZI: Umm... So not necessarily, but I would say that that population would be older than the average

population.

MR. STEPHENSON: Well --

MS. GARZOUZI: So the average population of our wood poles is now 38 years. It's a year older than last year, if you take the whole demographic chart and you do an average, and so I would say that the 67,000, their average age is older than the population average age.

MR. STEPHENSON: But surely you must know the answer to that, don't you? You must know if you strictly went by your 67,000 poles in need of replacement, you will have a demographic profile of that 67,000, won't you?

MS. GARZOUZI: We have a demographic profile of that --

MR. STEPHENSON: And can you tell us what -- this is by way of undertaking -- but what the demographic profile of that 67,000 is?

MS. GARZOUZI: Yeah, we can provide that. The average age is closer to 45.

MR. STEPHENSON: Yeah, I'm not just looking for average. I want to know --

MS. GARZOUZI: Where they are.

MR. STEPHENSON: -- where they are. Okay?

MS. GARZOUZI: Yeah.

MR. STEPHENSON: You'll tell us, you'll find out what you got, and you'll give us what you have. I appreciate --

MS. GARZOUZI: So if I understand correctly, you'd like to see the age profile of the poles that have failed tests; is that correct?

MR. STEPHENSON: Exactly.

MS. GARZOUZI: Yes, I will undertake to provide that.

MR. QUESNELLE: Thank you.

MR. SIDLOFSKY: That will be J7.3.

UNDERTAKING NO. J7.3: TO PROVIDE THE AGE PROFILE OF THE POLES THAT HAVE FAILED TESTS.

MR. STEPHENSON: And then similarly on that front, with respect to poles that are at or after the end of service life, do you have a forecast life expectancy of those poles on the average?

[Witness panel confers]

MS. GARZOUZI: Okay, so we're talking about projecting again, so our replacement rate suggests that the expected service life of wood poles would be 72. So from 62 to 72, if we move forward based on the projections, and that could be found in BOMA 31C, where we project our expected service life, looking forward.

So when we talk about 62, that's a historical view, and when we talk about projecting forward, that's 72. If we assume -- if I may just clarify how we did that analysis, we made assumptions around, many programs replace poles, so we made average age assumptions on those poles, and then we took that the wood pole replacement would target end-of-life poles, and we projected that forward, and that's how we came up with the number 72.

MR. STEPHENSON: I just want to make sure I've got that point. And so the cohort that you are saying is a 72-year expected life, is that of all poles or just the ones

that are 62 and older?

MS. GARZOUZI: What we're saying is that with the proposed replacement rate that's in the current application the expected service life of wood poles would have to be 72, because of the rate, so if we consider that Hydro One in one year may replace 27 poles -- 20,000 in total, 22,000, 25,000, we took our historical numbers, and on everything that was outside of our control, we applied an average number, and what was within our control, we took the end-of-life numbers that we had, and we projected that forward, with the assumed replacement rate that is in the current plan.

MR. STEPHENSON: Okay, that's interesting, but that's actually not what I was asking. And let me tell you what I'm asking, and maybe you don't have this stat, but I would have thought you did. Okay? Here's the analogy. Turns out that because of when I was born and a bunch of other factors, the insurance companies say that I have a life expectancy of 82, which is a great thing. It's terrific. My father is 91, so I probably think I'm going to do better than that. But when I get to 82, if I'm lucky enough to do that, I will then have a new life expectancy, okay, and unfortunately it's not going to be all that long. You know, maybe it's five years, maybe it's eight years, maybe it's ten years or whatever, but I'll have a life expectancy.

Somebody that is 82 does have a life expectancy, and what I want to know is, if I'm a pole, and not me, what's

my life expectancy? Is it three years? Is it five years? How long do you have to get these things out of your system? That's what I want to know.

[Witness panel confers]

MR. JESUS: Sorry, sir. So the mean failure rate of our wood poles is 62 right now. As Lyla indicated, we are projecting that forward and that will become 72 years at the end of at the end of the period.

What that means is the probability of failure for those remaining poles is significantly higher, so it becomes a conditional probability or a hazard curve, if you will, which says given that you are 82 years old, how much more life do you have to live?

That's -- from a risk analysis point of view, it's called the decay rate or the hazard curve and I can guarantee you if I ever live to 82, I probably hope to live to 100. But at the end of the day, no one really knows. But certainly the rate is much, much higher once you reach the age of 82 of failing later on.

Does that make sense?

MR. STEPHENSON: Well, I mean, you know as a qualitative statement, yes, it makes sense. But if you don't have the number, you don't have the number.

But I would have thought, you know, you're in the demographic business. You've got hundreds and thousands of poles and you have a giant demographic problem, and I thought that might be something that you calculated.

MR. QUESNELLE: Mr. Jesus, you mentioned a mean

failure rate, and that's the 62?

MR. JESUS: The 62 is the average rate or the average life is effectively the mean life of the pole is how it's taken, so it's the mean life.

MR. QUESNELLE: And what's that calculation look like?

MR. JESUS: So it's based on all of the failures on the system that have occurred in the past, and we look at that and the average rate that the 50 percent of the population survives to be 62 years old. The other 52 percent lives beyond 62 years old, so it's the mean.

But failure rate would increase significantly based on the conditional probability of failure, the rate -- the risk or failure rate would increase by -- we can get you that number.

MR. QUESNELLE: I'm missing the connection then with how -- if 62 is a derivation of an analysis of failure rates and age being the 50 percent percentile -- 50 percent live longer, 50 percent go before -- how do you project that it will go out to 72 on a replacement rate? Isn't it still -- isn't that number always an empirical number? How do you project a future mean failure rate?

MR. JESUS: We have all of the demographics of when poles fail, so we're able to say at 72 years, when poles have failed, this is the survival rate. This is the rate the hazard or the decay rate, so we have those hazard curves for wood poles.

MR. QUESNELLE: So you are projecting the mean failure rate to increase by ten years based on your current

replacement rates.

MR. JESUS: That's right.

MR. QUESNELLE: Thank you.

DR. ELSAYED: I'm not clear now. You have a normal distribution, based on my understanding.

MR. JESUS: Yes.

DR. ELSAYED: With a 62 mean, which means 50 percent of your poles would fail before 62, and another 50 would fail after 62. And now you're saying going forward that mean will increase to 72.

My first question is why? What is the reason for that increase?

[Witness panel confers]

MR. QUESNELLE: We've stopped your clock, Mr. Stephenson.

MR. JESUS: So the 72 years is based on the replacement rate that Lyla indicated, that in ten years or after the end of this period, that the replacement rate would be effectively equivalent to 72 years.

So the poles on the system, because they're not getting replaced fast enough, effectively we're going to move the age from 62 to 72 years based on the replacement rate. So if we have to replace all the poles on the system based on 1.6 million, you would divide that by the replacement rate and you would end up with what is the number of poles you would have to replace.

Based on the replacement rate that we are indicating here, based on the process that Lyla has indicated, that

replacement is rate is equivalent to 72 years.

DR. ELSAYED: Is that good or bad, to go from 62 to 72.

MR. JESUS: That's bad. Given the benchmark study already indicated that we have one of the oldest populations in the system compared to our peers, going to 72 means that it would be twenty years beyond what our peers are doing.

MR. BOWNESS: I think what's really key here is that 62 years is where we want to be. If we were replacing -- we're comfortable with from a risk perspective. If we were staying at 62 years, that's where we feel the expected service life is in line with the replacement rate.

We know that we can't afford, our customers can't afford to keep the average age at 62. Based on what's in plan B modified, our average age will have to be 72. That means that there is more risk within the portfolio, which means more poles are going to fail. We are not in the spot where we want to be from a risk perspective.

MR. QUESNELLE: I just heard you separate those two numbers; they are not the same.

MR. BOWNESS: Yes.

MR. QUESNELLE: We're not going to a new mean projected rate of 72.

MR. BOWNESS: No. And I think what would be helpful from a visual is if we could just pull up BOMA 31 for a moment again; Exhibit I, tab 35, BOMA 31, and it's page 3 of 7.

Where you'll see in this chart is that with plan B modified, our age our poles will need to be 72 years.

If we went all the way to plan C, which was a significant reduction, the age would have to be 107 years and that's why we're not as willing to move as far to the extreme of plan C, and that's what we presented to our board, that it's way outside the risk paradigm.

From a risk perspective, from a pure asset perspective, we don't want to be at plan B modified; we want to be at plan A. We want to be at the replacement volumes that were suggested in plan A.

And those volumes, if we want to see that, are in AMPCO 27, if we could just pull that up for a second.

MR. STEPHENSON: Plan A only gets you 6,000 more poles, right? It's not a giant different between what you are planning now.

MR. BOWNESS: So within AMPCO 27, which is tab 29 -- sorry, Exhibit I, tab 29, AMPCO 27.

So plan A totals 77,400 poles over the five-year period. Plan B modified totals 72,000. And then if you go as far as plan C, which would be 45,000, that's where we get into that extreme situation of the expected service life would have to be 107 years.

DR. ELSAYED: So the...

MR. STEPHENSON: Sorry, go ahead, please.

DR. ELSAYED: I think at least my confusion is the -- that the use of the two terms "average age" versus "expected service life" -- and I think that's where the

confusion is.

Today, what is the average age of the poles?

MS. GARZOUZI: The average age of our wood pole population is 38 years.

DR. ELSAYED: And what is the expected service life?

MS. GARZOUZI: Sixty-two years.

DR. ELSAYED: Sixty-two. And with the program that you have in place, you are saying the expected -- what would be the average age over -- like, I mean, it would increase slightly, I'm assuming.

MS. GARZOUZI: It would probably increase by five years.

DR. ELSAYED: Yes.

MS. GARZOUZI: There is a spike, though, because all things being equal, it would be that way. But we have a bow wave. There's a demographic chart and maybe that's what's influencing the numbers here.

But if you look at B11, DSP section 2.3, the age demographic of the wood pole, there's two big spikes post World War I and II, and those are skewing the numbers.

DR. ELSAYED: So the increase from 62 to 72 is in the expected service life, not in the average age?

MS. GARZOUZI: Correct.

MR. STEPHENSON: Actually, if I can -- I think I can fix this.

The 72 has got nothing to do with the organic or -- what is the plan -- the pole is actually going to live.

The 72 is entirely driven by their replacement rate.

72 is what they need the pole to last, not how long the pole is actually going to last, right?

MS. GARZOUZI: That's correct. That's what I heard you say, Mr. Elsayed, but maybe I misheard you, but that's exactly right.

MR. STEPHENSON: If you --

MS. GARZOUZI: It is what you have to believe. It is what would have to happen given your current replacement rate and given the other demand investments, so we didn't pretend like nothing else was helping on the system. What we said is we know we also replace other poles for other reasons, so if we take that pool and replace it as well at the average age and we age that over the five-year term, that's how we came up with 72.

DR. ELSAYED: Okay. So you are hoping it will last for 72 years, and that's why --

MS. GARZOUZI: That's correct.

DR. ELSAYED: That risk would be higher.

MS. GARZOUZI: You would have to believe that for the replacement rate to be adequate.

DR. ELSAYED: Okay. Thank you.

MR. STEPHENSON: Now --

MS. ANDERSON: Mr. Stephenson --

MR. STEPHENSON: Oh, sorry.

MS. ANDERSON: -- just before you go on. There is another matter on this, and I guess I've been wanting to ask, and I don't know if you are the right panel, but is there a relationship between this expected service life of

62 years and your accounting depreciation for poles? Do you know what the average accounting -- the -- I guess what the accounting depreciation would be?

MS. GARZOUZI: Yes, it's 59.

MS. ANDERSON: So the accounting depreciation for your current population of poles is 59 years?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: Okay, Mr. Jesus, you made reference to, I think it was a hazard curve a little earlier? Okay.

MR. JESUS: Correct.

MR. STEPHENSON: I'd like you to undertake to produce that; is that a problem?

MR. JESUS: No, it's not a problem at all.

MR. STEPHENSON: Okay, great. Could I get a number for that?

MR. SIDLOFSKY: J7.4.

UNDERTAKING NO. J7.4: TO PRODUCE THE HAZARD CURVE.

MR. STEPHENSON: Thank you. And then just talking about, you touched a moment ago about the data regarding your -- the other utilities and the other poles' average life is 52, I believe was the number; have I got that right? I think it was something like that.

MR. JESUS: So based on the comparison in the benchmark study --

MR. STEPHENSON: In Navigant, yeah.

MR. JESUS: In Navigant, they indicate that we have the oldest -- one of the oldest populations compared to our peers, yes.

MR. STEPHENSON: Both in terms of their current average life and in terms of expected service life, right?

MR. JESUS: The finding was about ten years greater than our peer utilities.

MR. STEPHENSON: And are you aware of any exogenous factors which would account for that differential in the sense of, that your poles are of higher quality or that there is a more benign environment or whatever? Like, is there some -- is there something that explains that, or is it simply that you guys replace your poles less frequently?

[Witness panel confers]

MS. GARZOUZI: It is certainly a question we've asked ourselves, but I don't believe we have enough information to explain that difference.

MR. STEPHENSON: You know, and intuitively it would be hard to imagine that there is something like that. I mean, it seems counterintuitive that you guys have found the world's best poles or that the environment in northern Ontario is somehow less problematic than elsewhere in North America.

MR. QUESNELLE: Mr. Stephenson, can I just understand your question? It is not just the -- you're asking about -- to go back to the mean failure rate -- is the finding of the study that the mean failure rate is about ten years' difference, your mean failure rate is about ten years older, longer, than your cohort?

[Witness panel confers]

MR. JESUS: No, it's not. It's only about when we

replace our poles, so the expected service life of our peer utilities is 50 and we are using 62.

MS. LONG: You say you are using 52. I thought that that was an --

MR. JESUS: 62.

MR. QUESNELLE: 62. But when you say you're using that, isn't that a derivative of actual -- determining where the mean is?

MR. JESUS: That's correct.

MR. QUESNELLE: And so the cohort comparison isn't derived the same way, like -- one's a targeted exchange age or replacement age, the other is a factor of when poles are failing and what age they are, they go off. You are looking for the 50 percent, you are looking for the mean, so I'm just -- because to your point, Mr. Stephenson, if the numbers are derived the same fashion, it is not a matter of management choice, I wouldn't think. I'm trying to understand the question. It's not whether or not you've got a higher replacement rate irrespective of what your conditions are or what your program's about, if 50 percent are failing above -- around that number, higher or lower --

MR. JESUS: So in the utility industry the mean is actually the 50 percent for the survival curve is how they determine that, so the expected service life, and so if utilities are saying 50, that's how they're deriving it, they're saying the average life is 50 years, so 50 percent would fail before 50 years and 50 percent would fail after the 50-year mark, so if they're using 50 years, we're using

62, it is a difference between the geography and the utility.

MR. STEPHENSON: Okay, just coming back to Plan A and Plan B modified and its effect on demographics, I think we indicated that it was about 6,000 poles different between those two in terms of replacement lights.

Just to be clear, Plan A, if you had gone to that plan, you would still have worsening demographics. That 6,000 pole difference doesn't get you -- it would get you better than 72, but it's still going to be worse than 62, right?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: Okay. I just want to deal with demographics now. I gave -- I created a little bundle. To call it a compendium would be to glorify it. But I wonder if we could just mark that as the next exhibit. It is excerpts of prior cases plus a spreadsheet.

MR. SIDLOFSKY: That will be K7.2.

EXHIBIT NO. K7.2: PWU CROSS-EXAMINATION BOOKLET FOR HONI PANEL 5 COMPRISED OF EXCERPTS OF PRIOR CASES AND SPREADSHEET.

MR. STEPHENSON: Okay. Here I just want to go through some evidence from your prior cases to show what's happened with your demographics, and frankly, it's -- they're going in the wrong direction, if you bear with me.

The first place I want to go to is on the third page of the exhibit. It is page 16 of 26. And you will see here it's a chart, and if we just look at the bar on the

extreme right-hand side, you will see the 60-plus, and at that point in time you were reporting -- that is ten years ago -- about 90,000 poles in that category; do you see that?

MS. GARZOUZI: Yes.

MR. STEPHENSON: Okay, and we can take that -- there is no reason to doubt the accuracy of this, correct?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: Okay, just skipping ahead about four pages, we're now in the 2013 case, page 20 of 35, so this was filed in January of '14, so it would be '13 information. And so five years later, from 2008 to 2013, there is a heading, "demographics", and it says that 180,000 poles are at least 62 years old; do you see that?

MS. GARZOUZI: Yes.

MR. STEPHENSON: Okay, so in five years you went from 90,000 to 180,000, so that was -- those are worsening demographics, right?

MS. GARZOUZI: Yes, aging demographic.

MR. STEPHENSON: And it's all because your replacement rate isn't keeping up with your demographic curve, right?

MS. GARZOUZI: That's correct. So if we move on into your package -- and I know you're going there -- but it shows you more granular asset demographic of our wood-pole population, which is at page 21.

MR. STEPHENSON: Yeah. Of 35, yes.

MS. GARZOUZI: Of 35, figure 12, right? So if you go up a little bit -- oh. Okay. So if you go to D-1-1, DSP

section 2.3, figure 17.

MR. STEPHENSON: This is the update of the same chart, right?

MS. GARZOUZI: The updated, yes, 2.3, page 11. So this shows you how many poles are past expected --

MR. STEPHENSON: This is actually transformers, what we see on the screen.

MS. GARZOUZI: Oh, sorry.

MR. STEPHENSON: I'm told it's page 38 of the same document.

MS. GARZOUZI: Page 38. So we've colour-coded it here. Past expected service life is in red on the chart. In orange is what we'll reach expected service life within the planning period, the five-year period, and then within the expected service life is in blue on the graph.

And so every year, this entire graph is shifting by a year, less what's been replaced in the system.

MR. STEPHENSON: Right. And so and we now know that the total number at or -- at 62 years has gone from 180 in 2013. It's now up to -- what's the current number?

MS. GARZOUZI: 280,000 and over the plan it's going to go up to 400,000.

MR. STEPHENSON: Right, so it's -- you're adding about 20,000 net new at end of service life per year over the last period of time?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: And just to be clear, that's net. That's after you've taken a bunch out and replaced them,

right?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: And let's just talk about what the impact of that is. You've already said there is a correlation between age and replacement, that poles that are over 62 are disproportionately the ones in poor condition, right?

MS. GARZOUZI: I didn't say that. I think that there's a correlation between age and failure rate. I think failure rate increases with age. I don't know that there's a -- by the definition of the mean or failure curve, that's what we're saying.

MR. STEPHENSON: Maybe -- just let me go to the last page of my exhibit, which is the spreadsheet. And the first thing I just want to do is to check the arithmetic so that we're not fighting about math.

I don't know how much you've had a chance to look at all this, but it's not terribly complicated.

Were you able to understand what I was trying to do and confirm the numbers? They are all out of the evidence.

MS. GARZOUZI: Yes.

MR. STEPHENSON: Okay. So if we can, the first line is the current number of poles that -- end of service life 280,000, okay. So, if you use 280,000 versus 1.6 million, which is your total population, that's about 17.5 percent of the total; does that make sense to you?

MS. GARZOUZI: Yes.

MR. STEPHENSON: Okay Then let's look at how you're

replacing poles, okay? And, you know, there's two categories of pole replacements, right. You've got the ones that you are replacing as part of pole replacement, and then you've got the ones that you do because of other reasons, right?

MS. GARZOUZI: That's right.

MR. STEPHENSON: So what I did was I then looked at -- so line 4 is your five-year incremental end of service life poles. That's simply you've indicated that if you do your program, those -- you are going to be adding incrementally 54,000 by the end of the term, right?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: So at the end of the term, you've got the 334,000 number, right?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: And then you've told us also in the evidence that you are expecting 120,000 new poles at the end of service life over the next five years.

MS. GARZOUZI: You're looking at line 6 now?

MR. STEPHENSON: Yes, line 6; that's straight of out of your evidence.

MS. GARZOUZI: Okay.

MR. STEPHENSON: And what I just then did was a little bit of math, and I said if you didn't do the replacements, you'd be 400. So by definition, of the poles you forecast to replace over the next five years, 66,000 of those are going to be at ESL on your replacements. Do you agree with me on that?

MS. GARZOUZI: Okay, what's -- this is based on the hypothetical scenario, right? When we do our analysis we use our actual demographic and our actual condition information. So that's the difference between may be the numbers, or the way we're describing it and the way you're looking at. But this is...

MR. STEPHENSON: This is your forecasting.

MS. GARZOUZI: This is based on a hypothetical forecast, that's correct.

MR. STEPHENSON: This whole case is a forecast; this is your forecast, right?

MS. GARZOUZI: Yes.

MR. STEVENSON: Okay. So you look at that line, 66,000, and it turns out that I also went back and I looked at the numbers of the non-extended end of service life poles. And I went down and, if you look at line 14, I added up the total pole replacements that you are forecasting to do offer the period, which is 132,000, right, because I've added basically 67,000, you say -- sorry, the 12,000 you replace every year, so five times 12 is 60,000. Do you see that? That's line 13. And then I've just added that to your planned pole replacement, which is the 72,000. Do you see that?

MS. GARZOUZI: Yes.

MR. STEPHENSON: And I get 132,000. So then I subtract the 66,000 of end of service life poles and you get another number, it turns out it is almost exactly the same, 66,000. But half of the poles you replace are end of

service life poles and the other half aren't, it turns out.

You don't have any quarrel with that, do you? That's forecast.

MS. GARZOUZI: Okay.

MR. STEPHENSON: So it turns out that even though you are replacing -- or sorry, that your end of service life poles are 17.5 percent of your total poles, you wind up -- half of the poles you replace are end of service life poles.

MS. GARZOUZI: Yes.

MR. STEPHENSON: Yes, and so like -- your replacement program is not surprisingly very heavily skewed to end of service life, right? It's not -- if it was -- if this was even, it would be 17.5 percent of your poles you would be replacing those that were end of service life. But it's not; it's half of them.

[Witness panel confers]

MS. GARZOUZI: The only nuance I want to make here is that everything that is not replaced in the pole replacement program is more or less random. So it is not a targeted replacement.

It's replaced whether a car hits a pole, or it fails during a storm, or it fails in other circumstances, it's -- it's out of our control and for those, we assume average ages in our analysis and for replacements, we assume failed condition tests. So we use condition information.

So expected service life is a proxy, and it helps us project and understand what's happening. But we don't

replace based on age.

MR. STEPHENSON: I get all of that. But all I'm saying is your actual numbers reflect what is intuitively true, which is your end of service life poles are the ones that need replacing. I mean, this shouldn't be that hard.

Like, you know, people that are over 80 years old die at a rate much more frequently than people that are 20.What's so hard about that? I mean, isn't that right?

[Witness panel confers]

MR. NETTLETON: Mr. Stephenson, I'm just wondering if you could rephrase the question so that it relates to the evidence in this proceeding.

MR. STEPHENSON: No, sorry, all I'm saying is that your forecast is that you're disproportionately replacing poles that are at the end of their service life, and I'm just saying, isn't that consistent with the fact that poles at the end of service life are, in fact, in need of replacement disproportionately?

[Witness panel confers]

MR. STEPHENSON: Panel, if it's not true, you are doing something very wrong.

MS. BRADLEY: I don't know if I understand the question. Our end-of-life replacement program, which is the one that, you know, we have been talking about in the plan, is to replace poles that have been tested and deemed in poor condition, right? That's what that program focuses on.

A pole that fails and needs to be replaced because a

car hit it is replaced under "trouble", so the entire end-of-life pole replacement program is focused on end-of-life poles, yes.

MR. STEPHENSON: And I started this whole point with this -- which I thought was a rather uncontroversial statement, which the witness disagreed with, was that there was a strong correlation between end of service life and the need for replacement, ESL being 62. There is a strong correlation.

MS. GARZOUZI: I agree with that.

MR. STEPHENSON: Okay. Now, over the last ten years you've allowed your end-of-service-life population to go from 90,000 to 280,000. It's triple -- it is more than triple. You know that.

MS. GARZOUZI: Yes.

MR. STEPHENSON: Okay. So your problem has more than tripled, right?

[Witness panel confers]

MR. STEPHENSON: Who's going to pay for this problem that you've created for yourself over the last ten years? Like, today's ratepayers are much, much worse off than people ten years ago, because you kicked the can down the road, and when is it -- when are we -- who's going to pay for this? What year? When are you going to get back to 90,000 poles over end of service life? Let me ask you that.

MS. BRADLEY: Mr. Stephenson, we did state at the beginning that we know that we have a significantly higher

number of assets that we need to replace than we can currently fund through the rates, and that we are doing everything we can to do more with less, so the number in this plan is what we are proposing is a reasonable level for today, and we have the governance and reporting in place to manage to that number, but absolutely, we have a problem with a high number of end-of-life assets, and we are doing everything we can to address those.

MR. STEPHENSON: Okay, I'm going to finish this quickly, but just to be clear, I think three things are going to be -- are true about this.

Number one, these costs aren't going away, they are just being deferred. There is -- and the costs of -- right? This is not something going away.

MS. GARZOUZI: That's correct.

MR. STEPHENSON: Number two is, one of the consequences of the deferral is that some of the poles that you would have replaced under a planned program are going to wind up failing unexpectedly, correct?

MS. GARZOUZI: That's a fair assumption.

MR. STEPHENSON: And the unit costs for replacing those poles in an unexpected failure is much higher than it is under a planned program; correct?

MS. GARZOUZI: Slightly higher, and I think that, more importantly, it is the duration of the interruption. It is nine hours instead of two hours.

MR. STEPHENSON: I was about to get to that, yeah, and it's got a customer impact, right?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: And your system is going to have worse reliability, generally speaking, by having more old poles in the ground longer?

MS. GARZOUZI: Yes, if the poles fail on trouble calls or if they failed -- if they weren't caught in time from a planned perspective, it increases the reliability risk, and so there's longer duration, hence impacting our customers.

MR. STEPHENSON: Right. But, I mean, you -- this is part of a SAIDI impact that, you know, you replace -- if you get your -- if you replace more poles you would have had better reliability stats, right? That was part of your analysis for your board, right? I'm not going to get into the numbers, but directionally, correct?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: Okay, and -- but the net effect is these costs are being shifted from today's ratepayers to somebody else down the road, right?

MS. BRADLEY: The intent in the plan that we've put forward is to maintain the existing level of our assets overall.

MR. STEPHENSON: But you're not, but the demographics are getting worse. They are getting worse at a slower rate, but they're getting worse, right?

MS. BRADLEY: The plan right now with the latest condition information and how that plan -- the test results have changed in time, that it would be hard to keep up that demographic, with this plan, but the intent is to not let

the fleet deteriorate.

MR. STEPHENSON: Sorry, but your plan is to have 54,000 incremental end-of-life poles. You're planning on doing that. That's deliberate. That's the intention, right?

[Witness panel confers]

MR. BOWNESS: I think macro-ly your assessment is correct. You know, there has been a history of under-investment in the electricity grid, as we've seen that noted across the sector for a while now. What we're trying to do with this plan is make sure that we balance the asset needs with customer preferences and cost, and recognizing that cost is a significant dimension right now, there's only so much we can do within this planning period. I know we are focused in on productivity. We're looking at driving improved unit costs, trying to improve the way we execute work using our mobile technology. We also have to look at, I think, demographics from a long-term horizon, and if we could -- you know, using age as a proxy for the age of the fleet, if we could just pull up the -- which was the exhibit that we had up?

MS. BRADLEY: B-1-1-1.

MR. BOWNESS: B-1-1-1.

MS. BRADLEY: DSP 2.3.

MR. BOWNESS: DSP 2.3.

MS. BRADLEY: Page 38.

MR. BOWNESS: Page 38. Yeah, I think from a pure age perspective, there is a bow wave, there is a bow wave of

the red, right, and that's based on the significant amount of the grid that was built, you know, 60 or 70 years ago, but then if you look at the demographic for the next 15 years, it comes down. I think you could agree that the blue bars from an overall count perspective are lower, so at some point here, you know, yes, we need to catch up, yes, there are going to need to be more poles replaced. We hope to do that through productivity, we hope to do that through efficiency, but we also have to look at the long-term horizon when it comes to replacements.

MR. STEPHENSON: But just hang on a second there, because you helpfully colour-coded this chart, and as I recollect what you said, that the orange bars are the bars that represent the period of the application, right?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: Okay, so it turns out, as I read this chart -- you tell me I'm wrong -- we're actually at the trough right now. This chart is getting worse, not better, because basically the way this chart works is that you just move everything to the right every year, right? We're on -- we're headed back up the curve. Every year it's getting worse in the increment, not better, right?

MS. GARZOUZI: Everything is getting older every year, so we're shifting the graph by year.

MR. STEPHENSON: It's not that it's everything getting older; it is getting older at a faster rate than it is.

MS. GARZOUZI: There is a demographic boom, so certainly there is a cohort where there is a higher volume

of poles, that's correct.

MR. STEPHENSON: One last thing, okay. We asked you specifically what it would cost you to get back on track, which is at Exhibit I, tab 29, PWU 13.

And just -- this was about two questions and this wasn't actually about getting back on track. This was about not getting any worse than you are presently.

One was to keep the ESL poles at the same number and not increasing, and the other one was to keep the average age of the ESL poles the same. And you will see it was about 400 million doing the first thing, that's A, and about 680 million to do the second thing, and you see that's B. Do you see those two things?

MS. GARZOUZI: Yes.

MR. STEPHENSON: I take it those numbers are just complete non-starters for the purposes of this application. That wasn't even considered as a possibility, right? Is that fair?

MS. GARZOUZI: That's correct.

MR. STEPHENSON: But if you don't do that now and you continue doing what you're doing now, and we're back here in five years -- God forbid if I'm back here in five years -- these numbers are not going down. They are going to be a lot bigger to do the same thing we were asking then, right? Those numbers are just going to get bigger and bigger and bigger, right?

MS. GARZOUZI: Yes.

MR. STEPHENSON: Okay, those are my questions. Thank

you.

QUESTIONS BY THE BOARD:

DR. ELSAYED: Can I ask a question? Do you track life to failure of the poles, how long your poles actually last until they fail for those poles who do fail?

MR. JESUS: Yes, we track the age when it fails.

DR. ELSAYED: Do you have some statistics on that?

MR. JESUS: Based on the derivation of the hazard curve, we have -- we can provide the hazard curve.

DR. ELSAYED: I'm trying to figure out. We talked about the expected service life and average age, so I am assuming the age to failure is higher than those two.

[Witness panel confers]

MS. BRADLEY: I think our hesitation right now is some fail because they were hit by a car, or because...

DR. ELSAYED: No, I'm talking about age.

MS. BRADLEY: And that's why I'm not sure if we would have this specifically failed strictly because of age.

MR. QUESNELLE: Maybe I can...

DR. ELSAYED: The reason I'm asking the question is my concern is you can develop hypothetical expected service life based on parameters. And what I'm thinking is in reality, how long do these poles survive under normal operating conditions.

Do these estimates -- are these estimates of expected service life which you used to plan your program over-estimated, possibly? Or under-estimated?

MS. GARZOUZI: So a lot of these numbers are

hypothetical, and so we never replace based on expected service life. We actually replace based on end of life. It has to fail a test for us to replace it.

DR. ELSAYED: That's precisely why I'm asking the question. So if you replace based on the actual -- on failure of the pole, I'm asking what is the average age of those poles that you have replaced because they failed?

MS. GARZOUZI: This is why I was hesitant to agree with my friend here earlier on. Of the 67,000 poles that have failed based on our testing, their average age is 45 years.

DR. ELSAYED: So 67,000 poles that failed and the average age is?

MS. GARZOUZI: Forty-five years.

DR. ELSAYED: So why would that happen at such a low average age? What do -- did you analyze the reasons for that?

MS. GARZOUZI: No.

DR. ELSAYED: I mean obviously there's something wrong if they fail at that age, which is considerably shorter than your expected service life. They are failing prematurely; do you know why?

[Witness panel confers]

MS. GARZOUZI: Let's distinguish failure, like the pole broke, or it succumbed to mechanical stress or other things versus it failed a test. It could have failed a test for -- you know, the hammer test, the shell thickness test. It could have exhibited significant woodpecker decay

or woodpecker activity. So there are various factors that go into failing poles, and so I'm just distinguishing those two things.

MS. BRADLEY: So the number of the 45 years -- sorry, the 45 years that Ms. Garzouzi mentioned is the average age at which we get a poor condition pole through our testing; it's not when it physically failed.

DR. ELSAYED: Okay, thank you.

MR. QUESNELLE: And just to be clear, so that the poles that do fail at this point in time, 50 percent of that happens over 62 and 50 percent of that happens under 62; is that right?

MR. JESUS: That's correct, that's the survival curve, that's what the numbers show.

MR. NETTLETON: Mr. Chairman, just -- I don't know, Dr. Elsayed, if this was the question that I thought you asked, and that was when a pole fails -- not when it reaches a poor condition state, but when it actually has failed, do you track the age of the pole that's down on the ground?

MS. BRADLEY: I would say that right now, if a pole fails, it could have been a car hit a tree, it could have been a storm, and if during trouble call situations or storm restoration, I would say that we don't have the exact date and the exact failure.

Was it due to pole thickness, was it due to a tree falling on the pole. There are so many factors that to have a significant history with that level of detail

recorded, given the systems we had, say, yen years ago, we wouldn't have data on that level of detail.

MR. QUESNELLE: I think we're still at a bit of a loss here as to the connection between the 45 years being the average age of the poles that have been identified in that 67,000 and what goes into the derivation of the mean failure rate of 62. Because if we don't have details on when a pole falls down, what's that type of -- I'm taking the difference between failure of a test versus a pole failing in the field and I think, maybe by way of undertaking, if we could have an undertaking that responds to the distinction between the two, and a little more -- maybe it's an addition to the provision of the hazard curve, as to what that means and how that differs from the other numbers that we're talking about today.

DR. ELSAYED: Another way to ask the question is: If you -- similarly to other assets that you've said you run to failure, if you were running your poles to failure, if you were waiting until the poles fail, how many would you replace every year?

MR. JESUS: We'll take that undertaking.

MR. SIDLOFSKY: That will be J7.5.

UNDERTAKING NO. J7.5: TO PROVIDE A RESPONSE TO DR. ELSAYED'S QUESTION: SIMILARLY TO OTHER ASSETS THAT YOU'VE SAID YOU RUN TO FAILURE, IF HONI WERE RUNNING POLES TO FAILURE, IF HONI WERE WAITING UNTIL THE POLES FAIL, HOW MANY WOULD HONI REPLACE EVERY YEAR

MR. QUESNELLE: Mr. Pollock?

MR. POLLOCK: Hello, everyone. Thank you, Mr. Chair. I guess as a preliminary matter we had a compendium, so I was wondering if we could get that marked as an exhibit.

MR. SIDLOFSKY: J7.3.

EXHIBIT NO. J7.3: CME CROSS-EXAMINATION COMPENDIUM FOR HONI PANEL 5

MR. POLLOCK: And I guess before I begin, how long did you want to go today, Mr. Chair?

MR. QUESNELLE: Quarter to five.

MR. POLLOCK: Okay.

MR. QUESNELLE: I take it that will split your -- you will be starting again tomorrow morning?

MR. POLLOCK: Yeah. Absolutely.

MR. QUESNELLE: Okay.

CROSS-EXAMINATION BY MR. POLLOCK:

MR. POLLOCK: So thank you for your time, panel. It has been a long day, so hopefully I will be able to get through this.

I thought I would begin with questions that were asked by a colleague of mine for panel 1 that were deferred to you, and essentially if we could go to page 1 of the compendium, this is just the title page of the Hydro One distribution business plan that was from December 2nd, 2016; correct?

MS. BRADLEY: Correct.

MR. POLLOCK: And it was updated on December 8th, 2017, and that's at page 5, the title page is at page 5 of our compendium.

Is it correct that that's the date of the update for 2017?

MS. BRADLEY: Correct.

MR. POLLOCK: Okay. So we have two years' worth of distribution business plans, and I guess since my questions will sort of focus on this, I wonder if you could just give me an outline of what the distribution business plan is and how it relates to the distribution system plan and the application as a whole.

MS. BRADLEY: So the distribution business plan is, annually we go through an investment planning process.

MR. POLLOCK: Um-hmm.

MS. BRADLEY: And this is the summary of the investment plan that we do in that annual process that is provided to our board of directors to summarize as a business where we're going and what that five-year plan looks like.

MR. POLLOCK: Okay, and how does it relate to the distribution system plan and the application that's before the board?

MS. BRADLEY: When we're filing an application, this would contain the investment plan that is submitted to the board, so it is the basis of the distribution system plan.

On the in-between years it's not obviously used for that, but what the years we filed it is summarizing the investment plan that forms the DSP.

MR. POLLOCK: Okay, so it would be fair to categorize it as sort of a foundational document, so other things are

built on this foundation?

MS. BRADLEY: That would be fair.

MR. POLLOCK: Okay. So if we could go to page 3 of the compendium. So here, as I understand it, this is the beginning of the 2016 distribution plan, and you're sort of giving a 10,000-foot view of Hydro One and various attributes of the utility; is that fair?

MS. BRADLEY: That's fair.

MR. POLLOCK: So I just wanted to take you to, under the heading "geography", four lines down, where it starts "Hydro One maintains", do you have that?

MS. BRADLEY: I do.

MR. POLLOCK: So it says: "Hydro One maintains over 100,000 kilometres of rights-of-way."

So let's just stop there, and if would turn to page 7 of the compendium. This is the 2017 version, and it has got the same paragraph here, "geography", and if you go four line lines down we have:

> "Hydro One maintains over 104,000 kilometres of rights-of-way."

So you would agree with me that there was a 4,000-kilometre increase in the amount of rights-of-way just to start, right?

MS. BRADLEY: That are reflected in this document, yes.

MR. POLLOCK: So can you tell me why it is -- is it a dud issue, is there something going on with the business that has increased your rights-of-way over the year?

MS. GARZOUZI: No, one was just a round number, the other one -- the 104 is the data from our GIS, our geospatial enterprise system, which is an accurate kilometre view. It is not exactly 104. There are decimals after that, but we rounded that number as well.

MR. POLLOCK: Okay. So in the 2016 one you didn't use the GIC, you sort of gave it a rough estimate that was close, and then you got the GIS and you gave it a more --

MS. GARZOUZI: We had GIS. It was just --

MR. POLLOCK: Okay.

MS. GARZOUZI: -- it was rounded to 100,000, and then in the update -- I was there for the update, so I went to GIS and pulled the values from the system.

MR. POLLOCK: Okay. So it was a more stylistic choice than anything else.

MS. GARZOUZI: Yes.

MR. POLLOCK: Okay. And then -- so if we are back on page 3, please, the second half of that same sentence says:

> "And although the majority of the company's distribution power lines are along roadways, one-third of the lines are off-road, requiring the use of special equipment for access and maintenance."

Do you see that?

MS. GARZOUZI: Yes.

MR. POLLOCK: And if we flip back to page 7 of the compendium, please. And so the same sentence the next year says:

"The majority of the company's distribution power lines are located along roadways and about one-quarter of the lines are off-road, requiring the use of special equipment access and maintenance."

So that seems to be a fairly significant jump between one-third and one-quarter. Can you explain the drivers for that change?

MS. GARZOUZI: The difference is in the year before there was blank data, and so the way that that was assumed was different. Again, the latest number that you see is just pulled from GIS, and the most accurate data at that point in time.

MR. POLLOCK: Okay. So as opposed to the first one, which is stylistic, this actually is a data issue that you have better or more accurate data to go with? Because it seems like a very significant one just to be stylistic in terms of how you come about it.

MS. GARZOUZI: I think it's how you would deal with blank information in the system and how you would derive from your GIS.

MR. POLLOCK: Okay, so continuing with the theme, if we could go back to number 3 -- or page 3, sorry. And we're going to go to a different paragraph, "aging and deteriorating infrastructure", and I want to go to the fourth line, where it says "for example, Hydro One". Do you have that? Fourth line down on the right-hand side, "for example, Hydro One"?

MS. GARZOUZI: Yes.

MR. POLLOCK: Okay. You got that? So it says:

"For example, Hydro One currently has 240,000 wood poles, 15 percent of the fleet, that are beyond their expected service life of 60 years."

So let's hold there, and if we flip back to page 7, under the heading "aging and deteriorating infrastructure", we have three lines down this time, just at the right-hand side, "for example", and it says:

"For example, currently has 280,000 wood poles, 17 percent of the fleet, that are beyond their expected service life of 60 years."

So once again I think you will agree with me that there is a 40,000 wood-pole difference between the two documents?

MS. GARZOUZI: So the demographic track that we are just looking at, it's the shifting of a bar for one year.

MR. POLLOCK: Right. So can we actually pull that up? Thank you. I apologize. It is not my compendium, but if we could go to B1-1-1, DSP section 2.3, page 38.

Hopefully we still have that handy, since you were discussing it just a little bit ago. All right.

So I don't see between the orange and the red there being a cohort as high as 40,000. So I was hoping that you could help me with that.

[Witness panel confers]

MS. GARZOUZI: I'm not sure why that is. I can confirm.

MR. POLLOCK: Yes, if you could undertake to confirm

that for me.

MS. GARZOUZI: Yes.

MR. POLLOCK: And I suspect since it's related I might also need an undertaking for this, but if we go back to page 3 of my compendium.

MR. QUESNELLE: Just mark the undertaking first.

MR. POLLOCK: Oh, sorry.

MR. SIDLOFSKY: J7.6.

UNDERTAKING NO. J7.6: WITH REFERENCE TO B1-1-1, DSP SECTION 2.3, PAGE 38, TO EXPLAIN BETWEEN THE ORANGE AND THE RED, WHETHER THERE IS A COHORT AS HIGH AS 40,000.

MR. POLLOCK: Thank you.

So if we go "aging and deteriorating infrastructure", and we have line 1, 2, 3, 4, 5 -- the fifth line down, right at the end, "if no replacements are made". Do you see that?

MS. GARZOUZI: Yes.

MR. POLLOCK: So it says:

> "If no replacements are made in the next five years, the number of wood poles beyond their expected service life rises to 400,000."

And if we turn to page 7 of the compendium again, and we go down to aging and deteriorating infrastructure, and I think six lines -- at least six lines down, just off the left-hand side:

> "If no replacements are made in the next five years, the number of wood poles beyond their

expected service life rises to 400,000."

So interestingly, the number of poles at the end of the period seem to between both documents, despite the fact that you have found 40,000 new ones that have reached their expected service life. So I'm wondering if you could also help me determine why that is.

MS. GARZOUZI: I'm familiar with the more recent document, so I can explain to you how I derived the number in the more recent document. I am having trouble with the older document and explaining why the numbers are such in the older document.

MR. POLLOCK: I guess -- so from your answer, can I take it that the way you derived the numbers in the new one didn't really have any relationship to the way that whoever did the 2016 derived their numbers. Is that fair?

MS. GARZOUZI: I can't comment on how they did it. I just know that I pulled the most recent information that I had available at that time in our enterprise system.

MR. POLLOCK: You didn't look at what they did and try to copy it. You just sort of took the information that you had from a source that you knew, and it was sort of without any relationship to the one previous; is that fair?

MS. GARZOUZI: That's correct, I used our enterprise system and I updated the numbers in the documents based on the enterprise system. I didn't look at the methodology that was used before.

MR. POLLOCK: Would you be willing to undertake to see why the number of poles at the end of the period is the

same between the two, given that the previous document had 40,000 fewer at the beginning of the period?

MS. GARZOUZI: I could try to -- I could see what I can find, certainly.

MR. POLLOCK: Thanks.

MR. SIDLOFSKY: J7.7.

UNDERTAKING NO. J7.7: TO EXPLAIN THE DIFFERENCE IN THE NUMBER OF POLES CALCULATED TO BE AT END OF LIFE IN THE TWO DOCUMENTS

MR. POLLOCK: And I guess we'll make a clean sweep of it and if we could go back to page 3 -- so finally, I think it's six lines down, I guess starting five lines down. So after 15 percent of the fleet in brackets, do you have that reference?

MS. GARZOUZI: Yes.

MR. POLLOCK: You've got it? Okay.

MS. GARZOUZI: Yes.

MR. POLLOCK: So we've got 15 percent of the fleet that are beyond their expected service life of 60 years, and 144 station transformers, 12 percent of the fleet.

So if we go four pages on to page 7 under the same heading, and for this one it says there are -- sorry, there's 17 percent of the fleets for wood poles that are beyond their expected life of 60 years and 279 station transformers, 23 percent of the fleet, that are beyond their expected service life of 50 years. So that's nearly double, correct?

MS. GARZOUZI: So this one stood out for me when I was

updating the numbers, and we restated it again based on best data that we had available. But we tried to recreate the 144 because it did stand out as different, and I was unable to.

When I went back at that point in time, the data for that point in time, I would have said 236 in 2016 using the same system. And so based on that, that would have been consistent with what we had filed in 2014,which coincides with the 19 percent of the station transformers that are beyond their expected service life.

So I would correct that. In 2016, I would have said 236 versus 144, and I stand by the 279.

MR. POLLOCK: Understood. So am I right in thinking that the lion's share of the application is based on the 2016 distribution business plan -- and I'll explain to you what I mean.

So the 2016 distribution business plan came out. You formulated the application, or you were in the process of formulating the application, and you filed the application in March of 2017, is that correct?

MS. GARZOUZI: That's correct.

MR. POLLOCK: And so as it was going along, in December of 2017, you updated the distribution business plan and you also updated your filed evidence with Exhibit Q, correct? That was also December of 2017?

MS. GARZOUZI: That's correct.

MR. POLLOCK: And Exhibit Q specifies what it's changing, so all the differences, I think, specifically

general plant spending was a big one in terms of the change. But it specifies in Exhibit Q everything that you're updating and changing, right?

MS. GARZOUZI: Yes.

MR. POLLOCK: So everything that you haven't updated was based on the 2016 distribution business plan, correct?

MS. BRADLEY: The one thing with the numbers you just had stated before, I know that in our evidence, in the distribution system plan under the wood pole section, it does state that there are 280,000 poles at least 62 years old, which is what it says in the most recent business plan that you've pointed to.

We can follow up. I don't know if somebody maybe didn't update those numbers or something in the last time they did them, but the evidence is aligned with the more recent numbers that Ms. Garzouzi said she is familiar with.

MR. POLLOCK: Thank you for that. But the distribution business plan is the document that went to your board, right?

So the way I understood the sort of relationship was the business plan was the foundation and the application was built on that foundation. And so this is the document that went to your board, rather than the evidence, correct?

MS. BRADLEY: Correct.

MR. POLLOCK: Okay. So I guess to circle back to the question before that one is everything that wasn't updated in Exhibit Q was based on the distribution business plan from 2016, correct?

MS. BRADLEY: Correct.

MR. POLLOCK: Okay. Am I right in thinking that as a result of all of these differences in information, that there were no updates to your proposal before this Board? I appreciate that your update had general plant differences, but these numbers didn't drive -- or these deltas didn't drive any new investment decisions. Is that correct?

MS. GARZOUZI: That's correct.

MR. POLLOCK: Okay. I'm at a natural breaking point, so I wonder if the Board would like to break now.

MR. QUESNELLE: That's fine, Mr. Pollock. We will resume tomorrow morning at 9:30, and we are adjourned for the day.

--- Whereupon the hearing adjourned at 4:41 p.m.