



COMMISSION OF INQUIRY RESPECTING THE MUSKRAT FALLS PROJECT

Transcript | Phase 2

Volume 29

Commissioner: Honourable Justice Richard LeBlanc

Monday

6 May 2019

CLERK (Mulrooney): All rise.

This Commission of Inquiry is now opened.

The Honourable Justice Richard LeBlanc
presiding as Commissioner.

Please be seated.

MR. KEAN: Good morning, Commissioner.

THE COMMISSIONER: Good morning, Mr.
Kean. Welcome back.

All right. Good morning.

Ms. Muzychka?

MS. MUZYCHKA: Good morning, Mr. Kean.

MR. KEAN: Morning.

MS. MUZYCHKA: Before we start, I'd like to
enter new exhibits.

THE COMMISSIONER: Okay, just give me
one second now. Spilled a bit of water here on
my desk, so I got to clean up and (inaudible).

All right. Go ahead.

MS. MUZYCHKA: Okay. We have new
exhibit numbers 01962, P-03154 to 03198,
03233 to 03240, 03252 to 03271 and 03274 to
03276.

THE COMMISSIONER: All right. Those will
be entered as marked.

All right, Mr. Kean, if you could stand then,
please.

Is he going to be sworn or affirmed?

MR. KEAN: Affirmed.

THE COMMISSIONER: Affirmed? Okay.

CLERK: Do you solemnly affirm – excuse me
– that the evidence you shall give to this Inquiry
shall be the truth, the whole truth and nothing
but the truth?

MR. KEAN: I affirm.

CLERK: Please state your name.

MR. KEAN: Jason Kean.

CLERK: Thank you.

MS. MUZYCHKA: Okay.

Mr. Kean, you've given testimony at Phase 1 of
the Inquiry, so just to recap, you were the deputy
general project manager from January 2011 to
January 2017?

MR. KEAN: Yes, I was.

MS. MUZYCHKA: Okay.

And you were also the senior manager for
overland transmission lines from January 2013
to January 2017?

MR. KEAN: Correct.

MS. MUZYCHKA: Okay.

And I also understand that you were never an
employee of Nalcor but rather you were there as
an independent contractor?

MR. KEAN: That's correct.

MS. MUZYCHKA: You worked through your
own company called Project Solutions Inc.?

MR. KEAN: That's correct.

MS. MUZYCHKA: Okay.

And then I understand you left the project in
January of 2017?

MR. KEAN: That's correct.

MS. MUZYCHKA: Okay. All right then.

So what – since then you have been working in
what capacity – since you left Nalcor?

MR. KEAN: I've continued to work as a
consultant with various owners and some third
parties; various activities; providing expert
opinion on matters, as an example; providing
project management support and so on.

MS. MUZYCHKA: Okay.

I understand you also worked for Westney Consulting. Is that correct?

MR. KEAN: Yes, I supported Westney – well, through Westney I supported Anadarko for a one-year period in the – that was in the period of 2018.

MS. MUZYCHKA: Okay.

Let's go back then to your involvement with the Lower Churchill Project, and I just want you to go over your roles post-sanction because most of the evidence we heard the last time was in relation to the pre-sanction part of your involvement. So just take us to where you began from about 2013 onwards – or 2012.

MR. KEAN: I guess I'll start with providing context around the transitioning from the – let's say the pre-sanction planning phase through to the post-sanction execution activities.

MS. MUZYCHKA: Okay.

MR. KEAN: So as we've gone through in the Phase 1, up to the point of sanction, there was a lot of focus on developing plans, methodologies, strategies of how the Lower Churchill would be developed – the Muskrat Falls Project. Of course a lot of engineering work underway to provide, you know, enough information to allow the decision-makers to make a decision about sanctioning.

Following sanction, of course, the – from a project team perspective, the focus shifted towards executing the plans that had been agreed, the plans that had been developed, controlling against those plans and really – you know, where plans – things didn't work out, acting as need be, making corrections, making recommendations for corrections.

So in that regard, of course, there were – there could – from an effort perspective and activity, there were plans associated with now we're starting early-works construction at the Muskrat Falls site; we're starting to issue requests for proposals – or continuations. Some of those had been issued prior to sanction, so the bid results

are starting to come in – negotiations with contractors –

MS. MUZYCHKA: And what was your role in that respect?

MR. KEAN: My role – well, in January of '13, I took on an active role in the transmission group, so from a contracting and procurement, I would have played a more active role there. For the other aspects of the project, I was on periphery. And by that, I would be a – oftentimes – a reviewer of bid list – bidders' list, you know, with maybe there would be 15 people on that review list. So I would be on one of the reviewers to say, did – was a process followed or was the project process followed?

So a lot of focus shifted towards execution against the plans; managing against the risks that had been identified; implementing those risk response plans that had been identified prior to sanction; looking to, you know, get early-works construction rolled up – underway; of course, ramping up the project team, in particular the site teams; ensuring those site teams were organized, they understood their roles – people had role descriptions, as an example, their organizational charts in place that were updated, there were various management plans that explained what people would do.

And things started to work together as a – I guess as an integrated system. So everyone's a cog in the wheel. Everyone needs to work in – towards this broader plan, and we each need to follow certain activities and do certain things in that regard.

MS. MUZYCHKA: (Inaudible.)

MR. KEAN: So that was a lot of focus in managing that aspect of that, and through that there was a lot of developing of project business processes, particularly where we struggle with some of the support from SNC-Lavalin. So we had to kick things up a higher notch there.

MS. MUZYCHKA: In what sense?

MR. KEAN: Well, there were a lot of procedures and processes that we had expected SNC-Lavalin to bring to the table, and unfortunately, the team – while those processes

existed in some fashion corporately within SNC-Lavalin, the teams that were mobilized had limited familiarity with those. So we would be often taking some corporate SNC business processes, looking at application of those within the project and working as part of the joint-LCMC team to make sure that business process reflected the unique attributes of our project. So then rolling that out – it out, making sure the Aconex tool was set up and established to support – let's say – contract change management or engineering change management or site queries.

MS. MUZYCHKA: Okay.

So as the project moved into, say 2014, did your role change? Did your focus, with respect to transmission increase?

MR. KEAN: I guess it certainly did from – as we got more and more into 2014 I took, as deputy general project manager, I stepped in more so on a day-to-day basis to help the established transmission team; to give them the – let's say – project management team support to get the contracts set off and work through some of the challenges we were having as a team. And that eventually transpired with the general project manager, Ron Power, asking me to really step in there more on a full-time basis. And in January 2014 the project manager for the transmission, direct – from that point onward, directly reported to me.

MS. MUZYCHKA: Okay.

And then – just to bring it to its conclusion, we had 2016 where Mr. Marshall took over the CEO position and bifurcation occurred, how did that affect your role?

MR. KEAN: Well, I guess, if I could just build a little bit through there.

MS. MUZYCHKA: Okay.

MR. KEAN: From 2014 onward our focus was, of course, getting the – completing engineering; getting the materials required for all the transmission; all the towers had to be designed, engineered and physically built and model tested in Spain. So a lot of work occurred there. All the material had to be secured. We had to construct

marshalling yards. We had to, of course, get the project to a point that, you know, things were moving along.

So through 2014, of course, the focus was on the AC transmission line between Muskrat Falls and Churchill Falls from a – right-of-way clearing and then the construction followed in, you know – sorry, 2013 that was – followed in mid-2014 with the commencement of the DC work. So the right-of-way clearing and the construction of the DC transmission, which was a two-and-a-half year program if – well, about a three – a 39-month program from the start of construction through to conclusion of construction for the DC transmission.

So, of course, by the time bifurcation occurred we were two-thirds through the build of the DC transmission line and, of course, from a change perspective, the organization had more segregation of responsibilities, you might say, with – now we had two vice-presidents – or now executive vice-presidents supporting the Lower Churchill Project.

MS. MUZYCHKA: And the two being Mr. Gilbert –

MR. KEAN: Mr. Gilbert Bennett was responsible for the power generation side, be it primarily the Muskrat Falls generation facility – or generating facility. And Mr. John MacIsaac was responsible for the power supply or transmission system. So what that basically was was the switchyards at Muskrat Falls – or at Churchill Falls, the transmission link between Muskrat – Churchill and Muskrat, the converter at Muskrat, the overland transmission from Muskrat Falls through to Soldiers Pond, the Strait of Belle Isle crossing and the converter at Soldiers Pond. And the basic intertie became Mr. MacIsaac's responsibility.

And I think that was – in context-wise, the project had always been conceived that power would first – the DC line would be energized with power from Churchill. That was the original design intent for the project. So, of course, that segregation, I guess, supported that strategy.

MS. MUZYCHKA: Okay.

Who were you reporting to in the period prior to bifurcation? How – what was the chain of report?

MR. KEAN: So prior to bifurcation I held two roles really. I was deputy general project manager to Ron Power, the general project manager, and in that the transmission group reported to me. There was a transmission project manager; I was effectively the senior project manager. So I reported to Mr. Ron Power who reported to Paul Harrington, the project director, who in turn reported to Gilbert Bennett, the vice-president.

Post-bifurcation, I was – there was no general project manager for transmission. I remained as deputy general project manager but I – rather than overall, it was deputy general project manager of transmission who reported to Mr. – well, effectively to Mr. MacIsaac because there was no one – for a period of time, no one between us for about five months you might say, as Mr. MacIsaac came in to assess the organization of how he wanted to structure it.

MS. MUZYCHKA: Okay. All right.

So when you left in 2017, just tell me where were you in terms of the transmission line project in terms of completion?

MR. KEAN: Sure.

I left on the 4th of January 2017. So at that point in time the AC's transmission between Muskrat and Churchill Falls had been constructed. The wires had been strung. The towers for the 735 interconnect at Churchill Falls had been erected and we were preparing for stringing the conductor. The DC transmission line in Labrador had been constructed. That means the right-of-way was cleared, the access were built, the foundations were in and the towers were up. It was – there was some stringing issues being worked through. We were taking down some conductor and re-stringing. On the Island we had constructed all but nine kilometres of access ways. So of 1,500 kilometres of transmission line access that we had constructed, 1,493 were – or 1,491 were constructed by the time I left. And all but 40 of the 10,000 hectares of vegetation had been cleared. And 40 per cent of foundations were installed on the transmission

line on the Island. Nine-million hours worked, 2.8 million without an LTI, the last 2.8 million, and all the material available.

So, you know, it was – I think overall construction completion was at 76 per cent, and that construction didn't include the engineering, of course, which (inaudible) been completed. So, you know, we were – there was a ways to go, of course. It was – by the time I had left we were forecasting to be complete in December of 2017. Valard actually concluded in November of 2017. So, you know, things were – we had a lot of challenges throughout, of course, a lot – a steep learning curve, you know, across the project. But a lot of good traction made throughout the preceding time, and of course things were concluded that year by the team.

MS. MUZYCHKA: Okay.

Now, the next thing I want you to touch on, and you mentioned it before in terms of the documentation that was prepared and manuals and procedures and construction guidelines, et cetera, so I'm gonna take you to a couple of them and ask you to give us some background on them.

The first one that I'll start with is the Project Execution Plan, and that is at Exhibit P-01966, and it's at tab 2, B1, of your binders. If I could ask Madam Clerk to bring up 01966.

MR. KEAN: Which binder would that be, excuse me?

MS. MUZYCHKA: At tab 2, binder 1.

MR. KEAN: Thank you.

MS. MUZYCHKA: I'm not gonna go through it in great detail, but I just want to ask you – scroll down a little bit so we can get the date on the – okay.

This document looks like it was approved or issued for use in September of 2011.

MR. KEAN: This particular version was issued, yes, in September 2011.

MS. MUZYCHKA: Okay. Actually, I thought that was the March 11, 2014, exhibit. Maybe

I've got the number incorrect. But there were iterations – that was the first one.

MR. KEAN: Well, the first would've been the A1, which is – means issued for review.

MS. MUZYCHKA: Okay.

MR. KEAN: Team – you know it's – and then of course we go through final commenting, in which we issue a B version, which would've been B1, followed by – very closely by B2. And further, B3, B4 would be reflective of major updates to the document, which I think occurred. I think there was a B3 in about 2014, as you said, reflective of the shift to the integrated team, Commissioner.

MS. MUZYCHKA: Okay.

So did you prepare this Project Execution Plan?

MR. KEAN: I'm the lead author, it was in that box, yes. I consolidated the work that had been done through a number of workshops and settings over the previous years and to – in order to come up with something, as we say, between two covers. The value is not the written plan per se, it is a – the process of getting to that point. And when we issued the B1, we had small half-size bound versions made for everyone as a quick reference. So yes.

MS. MUZYCHKA: Okay. And does the project execution plan purport to set out the framework for managing and executing the project? Or Phase 1, I think, is how you refer to it as the construction of the manufacturing or the generation facility.

MR. KEAN: Yes, it's a child, if you would, to the project governance plan and project charter, which are Nalcor corporate, if you would, level documents that would decree, you know, what we're trying to achieve and the basic framework of how we would achieve that. So this (inaudible) that and really articulates that scope of the project and how we – our approach to execute that scope.

MS. MUZYCHKA: Okay. And I think the framework is on page 5. I'm not sure if it is on that particular document. So –

MR. KEAN: Page 14 I believe, I see, yeah.

Yes, this is the framework for all the management system structure that existed within Muskrat – in the Lower Churchill Project, that still exists today. Of course, it's effectively a hierarchical relationship, pyramidal if you would, whereby a project governance plan and project charter define holistically what the project is, the broader goals and objectives and the framework of governance and decision-making within Nalcor for execution of the project, including concepts like contingency and reserves that we had talked about in our early phase. And the execution plan basically provides the structure of outlines and management philosophies and strategies for execution of the project from which falls a number of management plans at the next level.

So, you know, while the project execution plan may speak to change management, there is a separate management plan that deals with the management of change on the project, hence would come particular procedures and forms, and so on.

MS. MUZYCHKA: Okay.

This document also addresses risk management.

MR. KEAN: Yes.

MS. MUZYCHKA: And I think that might be on page 67. Yeah, okay.

And there's reference to: Proactive risk awareness and management being a key enabler of flawless execution. And then, I think, it's also noted in the next bullet that: "Predictability of outcome will be vastly improved when achievable objectives are first established. A full understanding of project risks early in the project's lifecycle will provide the greatest opportunity to complete the necessary work required to fully understand these risks" Do you agree with that? "... from which achievable objectives will be established."

MR. KEAN: Yes, I agree with those words.

MS. MUZYCHKA: Okay.

And so, I mean, this isn't the risk management document itself but it does reference the general philosophy, I guess, of the organization.

MR. KEAN: That's a – that was the – I was the principal author of the risk management work and this was the approach I was really promoting and, you know, got the team – helped push it along to get us to where we were, I guess.

MS. MUZYCHKA: Okay. So you said you were principal author of the risk management piece –

MR. KEAN: I was the principal author of the Project Risk Management Plan. I had an associate work with – that took the lead on the policy statement. But in 2007 when I joined the team I initiated the risk management work from the – there had been earlier work done in 2006 but really kicked it to the level and created the structure that existed, I guess, throughout 2010 through 2012 onward.

MS. MUZYCHKA: Okay.

Can we go to Exhibit P-01967, it's at tab 3. And this would appear to be the overarching ...

Okay, I got the wrong exhibit number. I'm sorry. It's –

THE COMMISSIONER: 01177?

MS. MUZYCHKA: 01977.

THE COMMISSIONER: I think it's 01177.

MS. MUZYCHKA: Oh, 01177. Which tab? Oh, okay.

Yes, I'm at 01177, but that's the Overarching Contracting Strategy. Okay, we'll pass over that.

As I understand, the difference between the 2011 version of the Project Execution Plan and the 2014 one – was there a change in terms of reflecting the difference in the management structure from the EPCM to the IMT?

MR. KEAN: Yes, the 2011 version aligned with the EPCM contract, in particular the coordination procedures and the scope of work

that was envisioned for the EPCM contractor. There were some responsibility assignment matrices and so on there. And what eventually happened with the 2014 version, you know, was that there were a general maturing of some concepts but those responsibilities were differentiated between the responsibilities of the engineer of record; as an example, SNC-Lavalin and responsibilities of LCMC as a Lower Churchill management entity that were responsible for the, you know, project management, construction management of the project.

MS. MUZYCHKA: Okay.

The next document I want you to have a look at is in tab 20 of book 5, or it may be called 116 and it's exhibit number P-00865.

MR. KEAN: Excuse me, which binder was that again?

MS. MUZYCHKA: Number five.

THE COMMISSIONER: Binder 5 in tab 5 – tab 20.

MR. KEAN: Common exhibits binder?

THE COMMISSIONER: No, it's just in your tab 5, number 20.

MR. KEAN: Thank you, Commissioner.

MS. MUZYCHKA: And that document – if we can just scroll up a little bit – is the Project Controls Management Plan, and if we look at page 6 of that document we see that its purpose is – you quote – I guess you drafted this document as well.

MR. KEAN: Yes, I had some support, which is not shown there, on both this and the other. A gentleman by the name of Ken McClintock, who I think you're interviewing.

MS. MUZYCHKA: Okay.

So it's noted that "An effective *Project Controls Management Plan* ... is critical to the success of the Nalcor Energy – Lower Churchill Project." And quoting from Peter Drucker: "*What cannot*

be measured, cannot be managed.” And I want you to just comment on that statement.

MR. KEAN: Well, the heart of project controls is really developing a plan of what it is, defining what the project is, defining the scope of the project, ensuring that’s clearly defined, developing an execution plan and schedules, and establishing a control basis. So that provides – and the control basis must be something that can be measured against. So, you know, control schedules, control estimates and so on. So, very important in that regard and you will – in that regard, there’s a – I created a diagram, which is shown on page 24 of this exhibit that may be able to provide a little bit of context for the Commissioner.

This borrows from the AACE framework for total cost management whereby we focus on – it’s very much a plan, do, check, act model. So what’s shown in this diagram is very – it’s a bit complex and I apologize for that, but it’s meant to articulate in steps 1 through 4, prior to sanction, we’re spending a lot of time defining what the project is, defining the execution plan – which we just went through – defining the contracting strategy. We develop the cost and schedule estimates, which gets translated in terms of a baseline that we measure against. And that’s the, you know, the \$6.2-billion baseline that we’re all familiar with.

Step 5 is really about monitoring, tracking our performance against that on a monthly basis, flagging concerns through that step 6, any trends, any analysis and forecasting, providing management outlooks, providing updates, providing measurement against that plan and identifying deviations and potential need for corrective actions. So – and of course verifying that the actions are taken and that continues on a monthly basis.

And this is what the – this is the – step 5 onward is really what the project controls team does as guided by our project controls manager. And that’s just repeated, you know, day in, day out. And there’s a proficient team that would be guided by this management plan and guided by the supporting procedures. And, as I recall, the management plan matured over time as new project controls managers came to – were hired.

MS. MUZYCHKA: Okay.

And then you carry on with step 7, forecasting?

MR. KEAN: Yes.

So that monthly forecasting of cost and schedule, what trends, what potential changes are out there, how may they affect, are there new risks that we’re aware of that may impact the project, what are we doing about them?

MS. MUZYCHKA: Would that involve trying to quantify the risks? Measuring them somehow?

MR. KEAN: Well, it may, but first and foremost, it’s about identifying and looking at risk from a – trying to frame the risk, I would say to you, to understand what the risk is, what – why it may occur, what could be the implications of that before you get into numerical side of it.

And a lot of risk work is done with what we call qualitative measure – qualitative assessment, so – to try to come up with a view of how relevant the risk is. So it’s not something you do a Monte Carlo simulation, let’s say, every month. It’s about understanding and trying to frame it because these items are often complex and come with a lot of arms and legs, you might say.

MS. MUZYCHKA: Okay.

And then that goes back to your baseline monitoring.

MR. KEAN: Yes.

So are there – when you issue your month – your report, you know, are there any – you may have a planned production curve, planned progress curve, and you’re starting to see variants from that. So of course, the variants would be driven by the actual – what’s occurring. And our forecast against that current variance would be influenced about what we think may occur.

So do we think, as an example, if a contractor is performing at a certain level or the weather is impacting a certain thing, do we think that will continue, or are actions taken to improve that?

So that would be translated into terms of a forward-looking view.

MS. MUZYCHKA: Okay.

And then there's – also, it branches off into a step 8 of taking corrective action.

MR. KEAN: Correct.

And that's – really bridges into management of change in many cases, or risk-response planning, or, you know – or it could – really management change is the heart of that because if you are seeing, through your project control cycle, that things – you have variance in the execution of your plans, things aren't going quite as expected, and of course you look at what can we do?

What are the options, what are the implications, or pros and cons of each option, you may say. So that – and that anchors back to what I – in my opening statement about talking about what we were doing post-sanction. Early it was about defining the plan.

MS. MUZYCHKA: Okay.

MR. KEAN: And so – and trying to make sure people were aware of what we were – you know, that plan and understood the estimates and limitations and so on. Post-sanction is really head down, you know, let's – we got to start executing these plans and understand the implications of – and well, get feedback from the contracting market, feedback from the field conditions and so on, to look at how things – are the plans holding true?

MS. MUZYCHKA: Okay.

And I guess that kind of strolls – rolls into the step 9, which is verifying.

MR. KEAN: That's correct.

MS. MUZYCHKA: And so that means to verify corrective actions taken and achieving desired results.

MR. KEAN: Yes, so the management change system is predicated upon either a deviation alert notice, which comes with a lot of actions and action tracking.

Of course, as you can appreciate, in any large venture there are a lot of things that need to be done. Some of them are identified initially; sometimes things come up. So it's very important to have action management. So you identify something's got to be done, but it's got to be followed through. So someone's on the hook. They do that, and there's a deadline.

MS. MUZYCHKA: Okay.

Now, the next document we're going to turn to is the Overarching Contracting Strategy, and that one is at Exhibit 01942, tab 8 of binder 1. I hope that's the right number.

And did you have involvement also in the preparation of this document?

MR. KEAN: Yeah, yes I did, context-wise. This document – the origin comes from an evolution of an earlier project management and contracting strategy document that had been issued, I think, in around 2009 period. I think that came about in – that was discussed in Phase 1. At this point in time Nalcor were involved in rating agency reviews, shadow credit ratings and so on. So it came about that we needed to ensure that it's very clearly articulated as to what the contracting strategy and why the contracting strategy is as it is for Muskrat – for the Muskrat Falls Project.

So this document was designed to clearly, you know, define and articulate the strategy that had been arrived up to this point in time.

MS. MUZYCHKA: Okay.

If we can turn to page 8 of the document, I think the purpose is set out. And it states that: "The purpose of this *Overarching Contracting Strategy* is to outline the overall contractual strategy as implemented by Nalcor for development of Phase I of the lower Churchill River, including the Muskrat Falls Generation, Labrador Transmission Assets, and Labrador – Island Transmission Link. It includes an overview into the adopted process to determine this strategy and insights into the reasons for selecting the overall management approach and contract packaging."

So is this the document that deals with the separation of the project into the various packages, or am I reading too much into it?

MR. KEAN: It is. It defines the – I guess it's a synopsis of – a summary of the rationale for that, and the work had – that had been done over the preceding three years to define the preliminary package strategy that would be provided to SNC-Lavalin during the start of the EPCM for their assessment.

MS. MUZYCHKA: Okay.

And I think it also refers to the – where the management activities will be undertaken with the engineering, procurement, construction and management.

Was there a variation in that when Nalcor switched to the integrated management team?

MR. KEAN: Sorry, I didn't get the first part of what you said.

MS. MUZYCHKA: I was just referring to a reference. In the purpose, it describes that this strategy will cover the way that all engineer – engineering, procurement, construction and management activities will be undertaken, including the allocation of those activities into various subcomponents and packages for execution efficiency.

So I know that there was a change in the process. Does the – was there a subsequent document prepared to reflect the change in the management of the project?

MR. KEAN: I don't recall specifically, but what I – in the context of this document, and this document defines the plan to have an engineering, procurement and construction management contract, and it – and from an engineering perspective, as an example, that an engineering, procurement, construction management contractor would be conducting the detailed engineering of Muskrat Falls, the transmission line and the switchyards.

Some of that was changed over time. For instance, the switchyards became a model whereby the engineering was conducted by an EPCM – EPC contractor. That was a strategy

change that was dealt with by way of a project change notice. So, following – any of those would be – come through that project change notice mechanism. I can't recall if this document was updated into a B2 or not.

MS. MUZYCHKA: Okay.

MR. KEAN: I – I don't think I was involved in it, so – and it's not sticking out in my mind as prevalent that there was a subsequent revision.

MS. MUZYCHKA: All right.

Is there anything else about this overarching contracting strategy document that you'd like to reference?

MR. KEAN: I think probably draw the Commissioner's attention to page 5, which is the executive summary.

There is a figure there, figure 1, which really boils everything down, to be quite honest with you. This – this is probably the key figure that summarizes the intent from a contracting strategy, and this is in that 2010-2011 period whereby the – it's – figure 1 is titled optimizing project delivery. It's – we've got strategic objectives, which are balancing absolute costs against cost certainty, while achieving the project quality, optimizing the project schedule, minimizing overall costs and schedule risk, achieving optimum and appropriate risk allocation and meeting benefits and First Nation obligations.

So those were the strategic objectives of the project, and that needed to be considered in the contracting strategy, which influenced the selection of the delivery model that's there noted as an EPCM, which states that a market is not amenable to a single EPC, but smaller EPC. Skill sets required vary across three SPVs or special purpose vehicles – be it – that's the LTA – the Muskrat Falls generation and the Labrador Island Transmission Link partnership.

And – so it goes on to define those, and of course packaging strategy follows out of that delivery model. And this is a synopsis of that. I wasn't – so, this would have been an effort led by the commercial business manager, Lance Clarke, with the, you know, procurement team –

Pat Hussey and so on – with a lot of other interface such as financing and so on.

MS. MUZYCHKA: Okay. All right.

Take you to one more document, which is the risk management philosophy, and that's at tab 13, book 1 and it's Exhibit 00897.

Did you prepare this document or contribute to its preparation?

MR. KEAN: If you go to – so, the first page – just for clarity – our original documents issued in 2007-2008 were reflected as Newfoundland and Labrador Hydro and had a different document number. For updates of those in the period of 2010-2011 they had a new cover sheet and they – it was – so, you may see there's only one signature on the front page because there was no change in the document – we're just putting a new cover sheet and a new document number.

So, the original document was by Mr. Lance Clarke and I took it forward to finish it in that February-April period of 2008.

MS. MUZYCHKA: Okay. And then it was –

MR. KEAN: This is a –

MS. MUZYCHKA: – dated.

MR. KEAN: – one of the early documents that were produced, actually, by the project team.

MS. MUZYCHKA: Okay. And what was its purpose?

MR. KEAN: Really, it was – I – can we just reference the purpose here on page 4, Commissioner. It says, "The purpose of this document is to outline the philosophy for effective risk management, including risk allocation, for the Lower Churchill Project (LCP).

"This Philosophy will: Define the foundation on which a risk management framework and program will be developed and implemented; Identify what mechanism will be used to define and allocate these risks; Identify where responsibility of risk can fall among" – the

various – "among the appropriate stakeholders; Identify who will participate in key decisions regarding determining" – risk acceptance – "acceptable risk levels; and Identify who will" – be participating – "in defining the optimal risk management strategy for the various risks."

So, a little bit of context here; in this initial phase, late 2007 we were trying to get a risk management program off the ground – a lot of different stakeholders involved. You got corporate stakeholders within Hydro at that point in time. You had a group that were doing power sales, looking at ways to move the power; it could be Gull Island, could be, you know, Muskrat Falls or some combination therein

We had people from financing, we had regulatory people, we had people from the province that were actively involved in – you know, be it the Aboriginal negotiations or the aspect of environmental assessment. So there were a lot of players involved and of course, trying to get people appreciate – there are a lot of risks there. Let's not just think about project execution risk, let's think about broader – make sure we have a program that reflects the broader business risk that you may find under an enterprise risk management program.

So this is the – we were trying to get people to – eyes to be wide open to the risk and look at – there's many – risks are multi – very complex and multidimensional. Let's figure out the best way to respond to that; and that might mean we – the risk has to be shared – the exposure. We may have to do some things from a legislation perspective, Mr. Province, or financing – you know, there's only certain things that can be done. Or what you need, Mr. Financing, you know, is that for financing purposes.

So, it really formed the basis on – talks about on page 7 there, there's a Figure 4.2 about a Risk Resolution Team. Getting a group together to talk about and understand what the risks are, the principle risks that are impacting the project and how they may, you know, how we may solve them. And sort – you know, they're – that – those risks, you know, could – when it comes to the financial side, we had a financial advisor that was part of that. We had our own financial team, plus we had a financial advisor, PricewaterhouseCoopers.

We had the province – you know, we had linkage with – at that point in time, starting to get linkages with the Department of Finance. I believe Terry Paddon was the deputy minister back then –

MS. MUZYCHKA: Okay.

MR. KEAN: – so they were starting to get plugged in. So it's about bringing it – casting the net wider to look holistically at these risks and getting people thinking about that.

MS. MUZYCHKA: Okay.

If we scroll down a little on that page, we see that you've identified objectives of the risk – or, sorry, the risk resolution strategy. And there's listed four different things that one can do, I guess, in terms of managing risk. Is that correct? Do you want to just go through each one of them and talk about them?

MR. KEAN: Sure.

Any risk management program, there are principally four ways, I guess, to respond to a risk. First is you can avoid it by eliminating the risk area, doing something completely different. That could be fine and a completely different alternate approach. So if you're concerned about – you know, if you're concerned about transmission line construction, maybe don't build a transmission line. That's, you know, one end of the spectrum. Or if you are concerned – mitigation is control or abatement so to reduce the probability and/or consequence of a risk – of an adverse risk event. So what can you do – are there barriers or things you can do to prevent anything – or reduce the likelihood of that occurring.

We often think about that a lot in safety, occupational safety related risks. We put various control barriers in place, such as PPE or fall arrest. Likewise, if the event were to occur, how do we – what can we do to reduce the consequences of that? So, again, borrow from the safety side: while we plan not to have safety incidents, should they occur, we need to be able to respond. So we need to have emergency response capability.

Allocation becomes very important in this early phase, also known as transfer. So you look to seek – to shift the consequence of a risk to a third party, together with the ownership of the risk, to someone maybe that's better managed to respond to it. This is often very much from a contractual perspective. You're transferring that risk, of course, and there is sometimes, unless the risk is understood, there's cost implications. So that's a principal – or it could be transferred from a power-sales perspective or various means.

Acceptance is just the nature of business. You know, big projects, as an example, if you're executing a megaproject, megaprojects have – any project have cost and schedule risk that are inherent with them. Every – so if you – if you're willing to execute any kind of project, there – you have to accept that there's some amount of risk that is systemic with those type projects.

MS. MUZYCHKA: And then, as noted, you live with it and run the risk, but you include a contingency to offset that?

MR. KEAN: And/or reserves.

MS. MUZYCHKA: Or reserves.

Okay. All right.

Okay, so –

MR. KEAN: If I – just one final – you know, this document was pretty important to get people – this is probably the most important risk management document we had, to get people really sitting to talk about what the risks were. And that was why that in the early phase of the project, a lot of the big risk items were brought out. And thankfully those were 2008 period where you see a lot of these, what we refer to as key risk. You know, I think there were about 30, 34 of them at that point. They were worked heavily over the years, but they were very important in terms of shaping the outcome of the project. So it's a very important document in that early phase –

MS. MUZYCHKA: Okay.

MR. KEAN: – for alignment.

MS. MUZYCHKA: All right.

The next issue I want to discuss with you is the contract for the overland transmission line. And I gather that was under your management?

MR. KEAN: It was.

MS. MUZYCHKA: And you were – we know that the contract was awarded to Valard.

MR. KEAN: Yes, both in the case of the AC transmission and the DC transmission. Separate contracts at different times.

MS. MUZYCHKA: Right, okay.

In relation to the DC transmission line, I understand that this project included clearing a right-of-way and also installing towers, stringing wires. Perhaps you can elaborate a little bit.

MR. KEAN: Sure. If I may, from a context perspective, the project is – was divided from a perspective of AC transmission and DC transmission. The AC being the lines between Muskrat Falls and Churchill Falls, two parallel lines totalling 250 kilometres each, approximately. And the DC line be it a 1,086-kilometre line between Muskrat Falls and Soldiers Pond.

Each of those lines were broken into segments. So the Muskrat Falls – the Churchill Falls line was issued in segments, basically with a break point of halfway up the line, between Muskrat and Churchill. So initially the contracting approach for the project was to go out, Commissioner, to the market for the AC transmission. Nalcor would hire a right-of-way contractor to clear the right-of-way, and for context-wise, that line largely follows an existing line that has existed from Churchill Falls since – for some time, back in the late '60s, early '70s. And it does – you know, it's not within too far a distance from the Trans-Labrador Highway.

So in that regard, it's not as remote as the DC line, you might say, nor as big structures. So we went to the market in late 2012 – sorry, we hired a right-of-way clearing contractor to do the clearing of that line. There were some challenges there with the contractor, Great

Western Forestry. Eventually that clearing contract, work was finished by Johnson's out of Corner Brook, and through 2012, late 2012, we issued an RFP to the market for the right-of-way – or for the, sorry, the transmission construction only.

MS. MUZYCHKA: For the AC line?

MR. KEAN: For the AC line.

And there was surprisingly not a lot of interest. We had fairly extensive pre-qualification, a lot of market sounding. We broke the package into, you know, fairly small pieces, you know, approximately \$100-million package each from a budget perspective. And we went to the market, and at the end of the day, we got back four bids: two international bids and two Canadian bids.

What we found is that one Canadian bidder could only – only had wanted to do 100 kilometres. That's all the capacity they had. We had one international bidder; it was three times the budget price and a very generic execution plan. We had another international bidder, Abengoa, who had a reasonable price. They were willing to do both segments; however, the – their execution plan wasn't very mature in their subcontracting. They were relying upon a lot of subcontractors for camps and foundation. And we had Valard.

And it became fairly clear that Valard were the contractor of choice through that process. Good relevant knowledge. Canadian – northern Canadian experience. And we went and saw projects, and eventually we were able to negotiate through a contract which was awarded to Valard, I think, in the – I think by December of 2013, as memory serves me correctly.

MS. MUZYCHKA: And was that a contract for the AC and the DC line?

MR. KEAN: Just the AC. I think it was valued at \$252 million –

MS. MUZYCHKA: Okay.

MR. KEAN: – which was a little bit – about 10 per cent over budget, and I think the work was – so that was for all the construction of the 500

kilometres of transmission line, the two parallel lines between Muskrat and Churchill, about 1,250 transmission towers. And we were about 10 per cent over DG3 estimate at that point in time, when that was awarded.

MS. MUZYCHKA: Okay.

MR. KEAN: And it eventually – so we awarded that, I think, 250, and when I left, it was around that 270, and work, you know, had been done. So very little change there on that package. We – concurrent with the AC contracting, the DC had been broken into a point that five separate segments between Muskrat Falls and Soldiers Pond.

Now the DC is a very different, and I think that's very important for people to appreciate the DC transmission. If you look at a map, the DC transmission line is going through the, you know, the inner depths of Labrador, you know, where there's, you know, there hasn't been probably many people, only First Peoples in that area and, you know, some trappers and so on. So a lot of remote areas crossing varying terrains on the Island through – over the Long Range Mountains, through the central part of the Island, eventually here on the Avalon – so very remote relative to the AC transmission.

SNC's strategy, and they had done the detailed planning work, called for a lot of helicopter construction for that line or a combination of helicopter construction and winter-only construction, particularly in the interior of Labrador. So the intent was to do the inner section of Labrador, the deep 100 kilometres in the middle, using winter-only construction. We would do the Long Range Mountains with helicopters, we would do winter construction in the Northern Peninsula, northern section and an area around Terra Nova, so it was a lot of winter considerations and planning because, you know, transmission is better to be done in winter if you can. It's less environmental footprint, things are frozen so – and you are crossing a large area.

MS. MUZYCHKA: Yes.

MR. KEAN: So it was deemed to be a very large project, you know, probably with the largest transmission project underway in North America.

MS. MUZYCHKA: And I think it was also the second largest package in the whole project. Is that correct?

MR. KEAN: Eventually, but not as it was initially.

MS. MUZYCHKA: Okay.

MR. KEAN: So we went – we started a process in 2012 to go out to the market and get as many different people interested. And I think we – we went to 23 different contractors to seek interest. I think 11 responded saying they'd be interested, we went through a pre-qualification process and we found that – we narrowed that down and we found that there were a couple contractors that had capability, maybe, for 100-kilometre segments, so 100 of 1000 kilometre or 1,100 kilometres. And eventually, what we started to do is get into to do a deeper dive into the capabilities of the contractors.

Now concurrently, we're just going through the AC side so we can see what the market is like, the strength of some of the international proposals. We're also getting to see the price differences that we saw on the AC bid. So we started to go visit various contractors and get – understand what they were doing, visit various sites, active transmission projects in Alberta and the US, international. And eventually, we came to a point that we didn't – we didn't see a lot of value in going through an extensive bid process to acquire bids that we knew at the end of the day were going to be probably not very competitive, or have very good execution plan.

So what we saw on the AC package was here we have a less complex job and we had really only one contractor that had the technical strength. There was one other big Canadian entity, but they were fully occupied and booked in Alberta and weren't interested.

So that led us to a point of approaching the – internally, a strategy to look at an open-book negotiation with Quanta –

MS. MUZYCHKA: To –

MR. KEAN: – Quanta Valard –

MS. MUZYCHKA: Right.

MR. KEAN: – for the DC package, which started in that fall of 2013.

MS. MUZYCHKA: Now, was that the first time you had done an open-book negotiation package?

MR. KEAN: Personally, me, but the commercial manager had done them before.

MS. MUZYCHKA: Okay. And so the process is different in the sense that you don't have a series of competitive bids which would, presumably, try to keep the cost down.

MR. KEAN: Of course. The premise of that, of the open book was ensuring the contractors had as much clarity on the project, all the risk exposures, where everything was, all the latest status of engineering so they would get to meet first-hand with engineering.

We would get to a point of understanding what the contractor's appetite for risk were. So it, the open-book process, which is used quite extensively on large, unique projects – open-book estimating, closed-book execution is, you know, quite prominent on very large projects. It allows for complete transparency and disclosure as to the latest engineering, you know, what we see as the risk, the – you know, all of the transparency on productivity and performance assumptions, the equipment-rate buildup and assumption that make – go into the estimate to form the estimate.

So in that regard, it provides a lot – rather than when you get a bid in, you're often trying to do the reverse engineering to check it against your own numbers, which is quite typical, you do your check bids. But in this case, given the unique attributes of the project, we deemed that Valard, Quanta was likely going to be the best proponent for the project, which it did turn out to be, and this would provide us with the ability to get the lowest price and get – have confidence in the contractor's execution approach.

MS. MUZYCHKA: Okay. So I take it then that the negotiations took place over a period of what, eight to 10 months?

MR. KEAN: That's correct.

MS. MUZYCHKA: Okay. And, was that an expected time frame, or was it unduly protracted?

MR. KEAN: No, I think it was generally expected, you know, there – it's a big program. That was why in the early phase, I – when we reached out to talk to Quanta, we were aware and – of this concept. Quanta had come to Nalcor about three years before this and had talked about: You know, we'd like to do all this program for you.

UNIDENTIFIED MALE SPEAKER: Yeah.

MR. KEAN: That was actually – I wasn't involved in those but Quanta had familiarity with these type of concepts for these bigger, nationwide programs, you might say.

So, in order to level set things and this – we knew this was gonna be unique to Valard as a company, so Quanta had a lot of experience. We're looking to Quanta and our – and we said: Let's define some basic principles of how we'd approach an open-book process to, you know, end up with a – you know, we're going in to this to get a win-win situation, so what does that mean, and how would we approach it?

So we laid out, if you would, some – jointly between Nalcor and Quanta, some rules you might say, if you would, you know, some guidance that we then used as part of a kickoff meeting with the respective teams to start this open-book process because – you know, of course, everyone's always a little bit – you know, this is maybe different for some people, so trying to get people to understand why we're doing this and talk about any concerns they may have.

MS. MUZYCHKA: Right.

MR. KEAN: So that was in the October 2013 period, I think.

MS. MUZYCHKA: Okay. And I guess there were frustrations along the way?

MR. KEAN: But as you can imagine, a project package this size with the number of elements, I think there were – you know, I think some of them could've been expected, really come back

to the aspect of being as transparent as possible and – but, I don't think they were not to be unexpected, you know, in the scheme of things. Very unique for many of the players, for Valard in particular, and some of it sometimes led to a little bit of frustration about, for instance, the buildup of labour rates. We see this much in there for small tools and equipment, it seems a bit high, we can't understand it, you know. Can you be a bit more transparent than that?

So that was some of the – some of the items that occurred but I think, at the end of the day, it – yeah, there's a little bit of frustration but not to be unexpected.

MS. MUZYCHKA: Okay.

I just wanted to draw your attention to Exhibit P-02732. Madam Clerk, please? It's at tab 29 of binder 2.

This – this is an email that you wrote to B. J. Ducey who, I guess, was a principal of Valard, that you were negotiating with?

MR. KEAN: What – excuse me, what tab?

MS. MUZYCHKA: Tab 29.

MR. KEAN: Thank you.

MS. MUZYCHKA: Okay.

And if we scroll down to – right there is good. No, back up a – right there. The paragraph starting with, "I have continued to reflect on where we are today versus my expectations of where we would be when we initiated this process back in ... October."

And then you go on to reflect –

MR. KEAN: Yeah.

MS. MUZYCHKA: – a significant gap, both in output and expectations. You didn't believe that the open-book transparent pricing model had been truly followed during the discussions and you suggest that maybe you had strayed?

MR. KEAN: Yes.

MS. MUZYCHKA: And what did you mean by that? Were you finding it difficult to negotiate under – using this style of –

MR. KEAN: No, I –

MS. MUZYCHKA: – (inaudible)?

MR. KEAN: – I guess if, you know, attached to this was the package there that really was what B. J. Ducey and, really, myself developed to establish that open-book development model. And, you know, there's some basic principles and – that are cast in there and the intent to be as open on all the elements of the estimate. And in – just prior to Christmas 2013, we had met with Valard to go through some – their preliminary execution proposal.

So as – how this worked, we met with – so, in 28th of October we met with Valard, or we met with Quanta, talked about this. We eventually got it moving in the – early November. November was a lot of workshops, working meetings to talk about various elements of the estimate. You know, for instance a transmission tower: Well, how many tons is the tower, what methodology would you use to assemble the tower, what would be the size of the crew, how long will it take for the crew to do that?

And I had my colleagues from the team, the SNC-Lavalin estimators and so on – they had strong views. Valard had strong views. So we needed to come to an understanding why those views are different. And that progressed. We didn't get through everything prior to Christmas, but Valard prior to Christmas gave a preliminary execution plan and an early price. Yeah, the price was much higher than I anticipated and I thought it was premature in that we didn't get a chance to look at some of the things.

So in that regard, when I was sending this in early January, having reflected, yeah things – you know, I think I was expecting that at that point in time we would've had great – much more alignment on some of the inputs, but it took us longer to get through that, I guess, than you know, perhaps thinking out front.

However, as I indicated, we knew this would be a struggle for Valard in the truly open-book – because it was unique for that. Not – but it was

new for – Quanta was familiar with it but, you know, some of the individuals in Valard – this was new to them, so getting every – new to some people on my team, as well – so getting everyone through that mindset, that collaborative aspect.

So, I guess, putting that time – putting – factoring that into the timeline, you know, in retrospect, is not long. But, of course, at this point in time, I was, you know, wanting to reaffirm that need to urgency, and let's step back and make sure we're truly anchored to these principles.

MS. MUZYCHKA: Okay.

So, it seemed like you were a little anxious about the time it had taken to that point without progress, would that be fair?

MR. KEAN: Well, I thought at – to be honest, that the basic parameters, like labour rates, would've been nailed at this point in time. Usually more at the back end it's talking about contractors' perception of risk, and how they're pricing in their risk and their markups and margins. That's where I expected it to take a long time.

MS. MUZYCHKA: Okay.

MR. KEAN: But not some of the basic parameters such as, you know, a debate about the size of a crew or the productivity of a crew on the assembly of a tower.

So, in that regard, yes, I expected the back end of the process to take a lot longer, and you'd need some, you know, senior representatives from both companies to talk about risk premiums and what they saw as the risk and so on.

So – but it's, you know – it was a good process. At the end of the day, when August came around, we both felt we had a – I believe a good contract that – and had established an approach that was solid to move forward.

MS. MUZYCHKA: Now, that contract – it was awarded for \$809 million. Is that correct?

MR. KEAN: It was a – that is correct.

MS. MUZYCHKA: And is that, from what I gather, is \$119 million over the budget at estimate for that portion of the work. Is that correct?

MR. KEAN: That is correct.

So, a couple of important things there. On the contract itself, the contract has the same terms and conditions as the AC contract. The Valard scope was the construction of the right-of-way – sorry, the construction of the transmission line, including the installation of towers, the erection of – installation of foundations, the guy anchors, the assembly of towers, the erection of towers, the installation of conductor and (inaudible). And that amount was equated to some 800 million – 809 million. That was referred to as part A of the contract.

During the negotiations, we had – were looking for ways to best execute the right-of-way clearing. And, of course, as I describe this project, there were unique elements of it, be it the – physically accessing some of the areas were challenging, as were the conditions themselves.

So, in that regard, there – we had come up with some ideas of how to creatively do more work, to look at finding ways to optimize the requirement for access for the transmission line.

It became fairly apparent that we would need more access than what was envisioned; however, some of the rationale – some of the reasoning for the incremental price that you had mentioned, at that point in time, was line construction. And it – we're seeing the tower weights and the hardware – the guy anchors and so on – that Valard had put into the open-book estimate that our engineers had come up with are getting to be much larger than what the DG3 estimate was. Things are getting bigger.

And this is – becomes, through this open-book estimate, we're each doing our own estimates of this again now, and we're realizing, yeah, there is a big incremental cost.

Now, these changes are being flagged by our management change process, but now is the one time we're putting it all together and seeing

we've got an incremental cost – a big cost – beyond what the DG3 estimate was. And –

MS. MUZYCHKA: So does that mean that the DG3 estimate was based on different towers and different costs associated with the transmission process?

MR. KEAN: Yes.

Would you – I guess it – would you like to –

MS. MUZYCHKA: I don't want to go into it in terrible detail, but I guess, you know, it wasn't enlargement of scope or anything. It was the installation of these towers. But you're saying that as the process went along, Valard was suggesting larger or more expensive towers than you had anticipated might –

MR. KEAN: (Inaudible.)

MS. MUZYCHKA: – be required.

MR. KEAN: So, if I could, a little bit of – I won't answer all the details.

MS. MUZYCHKA: (Inaudible.)

MR. KEAN: Context-wise, we had at DG3 – we had 37,000 metric tons of transmission towers and foundations on the DC transmission line. That was based upon – on a – designs that had been produced by – or the SNC-Lavalin engineers.

And, over that period between 2012 through 2013 there was a lot of changes occurring, driven by reliability requirements, that resulted in changes to those towers. They became heavier, they – changes to the foundations, they became larger to withstand the loading. The guy anchors became bigger; the guys became bigger. The construction method now for the larger towers had changed from what was in the estimate. The concrete bearing pads for concrete foundations were thicker.

So there's a whole – a lot of different things and, of course, through the open-book process, our – the SNC-Lavalin estimators who were part of the open-book process were updating the estimate, doing a check estimate against, you know, the things that we're giving Valard. And,

you know, there's toing and froing, looking at things, and it became fairly evident that, of course, the implications of all these design progression was an increased cost because things didn't look as they were at DG3; they were bigger.

So, you know, the – so as it – excuse me – as I said, the 37,000 tons of towers and foundations in DG3, well, when we awarded the contract to Valard, that was probably in the range of, you know, 45,000 tons. And when it was all said and done, well, it probably became closer to 50,000 tons. Things got bigger. This is a – the LIL is a very, very, very beefy system.

MS. MUZYCHKA: Okay. So, I guess, essentially it was an underestimate, at DG3, as to what this part of the project was going to cost?

MR. KEAN: No, the estimate aligns with the scope. We had scope change.

MS. MUZYCHKA: Okay.

MR. KEAN: So I just want to clarify that the estimators work with the scope that was identified and the engineering designs that existed. The engineering designs changed because the requirements on reliability and loading changed.

MS. MUZYCHKA: Okay.

MR. KEAN: So I'm sure we'll touch on that later.

MS. MUZYCHKA: We will.

All right. So ultimately, as we say, Valard was awarded the contract, and they proceeded with the work. Just want you to tell me how your relationship worked with Valard. You were a key point of contact, I take it –

MR. KEAN: So –

MS. MUZYCHKA: – between yourself and either Mr. Ducey or Kelly Williams, and we've heard from them this past few months.

MR. KEAN: So my point of contact was – I was the company representative. The

contractor's representative in the contract was Adam Budzinski, who actually was the president and CEO – or sorry, the president at that point in time. Adam – part of the agreement in the open-book negotiation process with Valard is that we wanted a project director from Valard, a senior member, and they had agreed it would be one of three individuals. It would be either Adam Budzinski, who was their president; it would be Victor Budzinski, who was their CEO, or it would be Jody Rideout, who was their senior project director.

And Jody was important because Jody was the individual who was leading the negotiations for Valard, from all the technical perspective. Unfortunately, just before contract award, Jody left Valard. So Adam became the nominated project director and mobilized to St. John's. So I – so he was my, if you would, direct counterpart from a perspective of company contractor, from a project – you know, filling the role of project director.

We – from a perspective of this – of the project, of course, we had been executing the AC; the contract had been awarded in December of 2013, and we had about eight months of field construction activity underway with Valard by the – on the AC line – by the time we awarded the DC line. Of course, so we were building upon all that process. So in my team, I had a project manager, who was Mr. Richard Donica, who was the liaison with the project manager on both the AC transmission – who I think was Dave Torgerson – and – who was actually the construction manager as well – and Mr. Kelly Williams.

So Kelly and Richard were the focal points therein from an operational execution of the work. However, I was the company representative in terms of fulfilling the obligations there, from signing notices and so on, under the contract.

MS. MUZYCHKA: Okay. Change notices – any –

MR. KEAN: And correspondence – final approval of payment certificates.

MS. MUZYCHKA: Okay.

So I just want to direct your attention to Exhibit P-02857, and that's at tab 20 – sorry, tab 33 at book 2 – or binder 2.

So, if we first go to the letter that's on page 2, and this is dated in October of 2014. So this was shortly after the project was awarded, correct?

MR. KEAN: Yes. Award in August 8.

MS. MUZYCHKA: And there's some issues in terms of – being raised regarding the right-of-way and the roadways not being fit for standard and so on. It seems like a fairly routine letter describing some difficulties Valard is experiencing, and he's writing you to make suggestions as to moving forward.

MR. KEAN: Far from routine, I would add.

MS. MUZYCHKA: Okay. 'Cause your response then – if we go to the email, it's your email to Adam Budzinski, and you also copy B. J. Ducey and Kelly Williams, who are with Valard. And your response is somewhat surprising – that you said you were “literally shocked to receive Kelly William's letter ... insinuating delay due to the conditions of the access road” And you describe an “... inflammatory tone”

I just want you to comment on the dynamics of –

MR. KEAN: Sure.

MS. MUZYCHKA: – that relationship between yourself and Valard.

MR. KEAN: So –

MS. MUZYCHKA: Early – and this is early in the project of –

MR. KEAN: Yeah. I think this is a very – you know, it's probably an important point from the perspective – so as I – the Valard contract took eight months to negotiate for the DC transmission. Early in the project, there was lot of work done in that December 2012, January 2013 on the – evaluating how we could construct the transmission in the context of what was required from an access perspective. A lot of risk, a lot of unknown in that regard because

of the changing sizes of structures. Things were getting bigger. So the validity of doing right-of-way – sorry, doing helicopter construction was getting to be, you know, questionable. As well, we had – you know, things had been gone – the – we had planned to have four winters available; now we had only three winters looking to have available.

So a lot of work done to look at how we can actually execute the right-of-way. Valard wasn't willing to take the risk on the right-of-way access. Of course, they would take it, but it would be a – you know, they would wish to have – be covered from an overall risk perspective, given the amount of unknowns.

Right-of-way access needed it to enable line construction. There was, at this point in time, no plan for permanent access to be along the right-of-way, or semi-permanent access on the transmission line.

The – so we worked with Valard to look at ways of doing this, and we eventually came up with what's known as a part B underneath the Valard contract, in that Valard – in order to look at a way of enabling access to be done but doing it for as cost-effective way as possible, leveraging all the learnings and knowledge that we both have – because we had just finished the right-of-way clearing on the AC transmission, the Nalcor team, who was, you know, quite experienced in – we had – you know, our team had – we had the former head of the Abitibi woodlands division was the manager. Well, we also had the former head of the Kruger woodlands division manager who was the other manager. So we had a lot of strength in road building. You know, and then we had a lot of guys retiring from Kruger that were joining the team.

So thankfully – so we had started to look at ways of doing access construction, what was needed, and we agreed that we needed to build a road that's fit for purpose to enable the line construction to occur. And the understanding was – going into it – we'd be looking at a viewpoint and we – and it turned out to be, I think, you know, so many dollars per kilometre we thought it might cost. And we eventually landed upon a situation where Valard and ourselves agreed that we will execute – we will manage the execution of the road – Valard said –

you will reimburse us for that management, management surfaces. We will do the flagging of the road. We will do the plan for what's needed because we know what we need from a line construction perspective, anything above and beyond a typical woods road that we would be proposing to build, if you would. So – and we're looking at what we can do from a helicopter construction, and we're going to put \$10 million in our bid just for helicopter work alone. If we need that for the mountains. We'll let – put that aside, but we're gonna look at how we can build this road as cost effectively as possible.

So through that process, we ended up with this part B; Valard is reimbursed for management services. They're effectively the general contractor for access management. However, Nalcor – the contracts with access providers will be on Nalcor paper. Nalcor and Valard would evaluate the bids, make a joint recommendation. Nalcor would administer the contract, is what's written in there.

So of course – and the people that Nalcor had would be seconded – or under Valard direction in the field. So why this is so important is that here we are early into the program. The access that was being constructed was being constructed under Valard management. It included some Nalcor people who are under Valard direction –

MS. MUZYCHKA: Mm-hmm.

MR. KEAN: – so I was a bit surprised in several reasons. One, we seem to have an issue that came out of nowhere because Valard people were out there managing, doing the road layout. They're out there with – you know, managing the work. I'm surprised.

Second, why didn't I get a call? We had established here an arrangement with a steering committee and trying to – if you look at the heart of the DC contract, there's a lot driven by – it even talks about Nalcor's values in there. And certain principles of how we would work.

And I guess I – Kelly wasn't involved in any of the negotiations. He came right from another contract. And it seems like, to me, he either wasn't aware of any of those unique

requirements or he – perhaps he didn't give as much regard to them.

So it didn't start out well. And I guess – also for context – you know, Kelly wasn't the nominated project manager. Jody Rideout was. As number two. We took a – you know, they convinced us to accept Kelly in that role and we did. And – but now I'm getting this letter early. So there's a lot of background things, I guess you might say.

So a little bit fiery, yes. But, you know, we have to put it in context of the things that are occurring around it.

MS. MUZYCHKA: All right.

Just turn to the next page – or the next document at tab 34. And it's your response. And it's a three-page letter so I'm not gonna go through all of that. But what struck me was the second paragraph.

THE COMMISSIONER: Okay. This is P-02856.

MS. MUZYCHKA: Yes, I'm sorry. Tab 34 of book 2.

And the second paragraph of your letter, you indicate that the corporation "...were extremely distraught by the messages exuded in this correspondence, which is in complete disregard of the are in complete disregard of the basis upon which our relationship had been formed and cemented."

MR. KEAN: Yes.

MS. MUZYCHKA: And then you talk about disheartening and wanting that – you know, upset over the fact that they didn't simply call you rather than putting their concerns in writing. Again, I, you know, put it to you that distraught and disheartening are somewhat unusual in the business context.

MR. KEAN: I would say not in my opinion, and the reason for that is that the right-of-way and access was work that we had done early to look at a win-win for both situations. This was a very unique range – arrangement. We had negotiated for what was, for Quanta, the largest

single award that they had ever had as a contract – for the contract.

We had done a large open-book here, a lot of time spent aligning, a lot of whiteboards used, a lot of flip-charts talking about things, a lot of expressing thoughts and, you know, being fairly open with each other in the months that it occurred and, you know – you know, very – you know, working with them in many ways.

I was taking 'em out to meet Service NL and Department of Transportation, helping them get their camps going, you know, so we were doing a lot to build a relationship, and also we had – you know, working with them to further the relationship with the IBEW, which we wanted to see strengthened.

MS. MUZYCHKA: So did you see these letters as more of a personal affront to your efforts?

MR. KEAN: No, I saw it as an affront to the relationship, and what we were doing as a – collective greatness that we were going to achieve together throughout this. This is a unique project, and of course, my passion came out in the letter. Anyone knows that I'm a passionate Newfoundlander, and I make no apologies for that.

MS. MUZYCHKA: Okay.

MR. KEAN: (Inaudible.)

MS. MUZYCHKA: Mr. Williams, when he testified here in March, had – or maybe it was April – had indicated or expressed that he thought that your letters were somewhat unusual in – especially in response to what he thought was a required notice for a possible delay under the contract, that was his view.

MR. KEAN: So my view was, you know, we were – so Mr. Williams is entitled to his view, of course, you know, and we all have different views that – but you know, these letters are reviewed by a team, and oftentimes they're written by a contracts administrator.

MS. MUZYCHKA: Mmm.

MR. KEAN: So, I felt quite comfortable with the letter, as I do today.

MS. MUZYCHKA: Okay.

Staying with the right-of-way, I gather that the responsibilities of who was responsible for what seemed to have been an issue between yourself and Valard, is that correct? Despite your statement that, you know, Nalcor was gonna hire the contractors of the – road-clearing contractors, but Valard was going to manage it and the cost was being borne by Nalcor, is that correct?

MR. KEAN: The fundamentally – they actually – so risk sharing whereby Nalcor would have ultimately – so there's a risk-sharing framework in the agreement whereby there was a targeted price for right-of-way clearing. Any – the team would work – the joint teams would work towards optimizing right-of-way access to get the best value and savings below that target cost of \$200 million would be shared. Of course, Nalcor wouldn't have to spend the money and Valard would get a bonus.

MS. MUZYCHKA: Okay.

MR. KEAN: So that was the premise behind that. Of course, in that regard we had risk for access conditions, as did Valard, because if the access wasn't there or of suitable standard, of course, they couldn't – they would not be as productive for line construction. So, each party had, you know, in that regard risk; but of course very mindful from our perspective that, you know, it's easy to overbuild access for the perspective of having – enabling line construction to make it to be more productive. That was always a concern.

MS. MUZYCHKA: Okay.

MR. KEAN: But as access progressed, of course it became – you know, the most difficult access was in Labrador where the conditions were the most challenging in all aspects.

MS. MUZYCHKA: I understand that Valard claimed that Nalcor overrode Valard's decision in trying to manage the road contractors. What do you say to that?

There was an example – it's not an exhibit that's in your binders but we can pull it up if you like – but they say that, for instance, when they were

raising a road-capping issue, that Nalcor took the position that Valard was in charge of the road, but when Valard then tried to direct the contractor to cap the road or widen it, Nalcor would refuse.

MR. KEAN: So I – so there's – you know, in the Valard file when I left there was probably 400 letters, there's thousands of emails between the respective parties. The management of the right-of-way was being lead by a right-of-way manager within our team and a right-of-way manager within their team, with respective field people.

We – Nalcor started out in DG3 with \$116 million. We spent \$450 million in access – or Nalcor did – \$467 million on access. So there was a lot of unplanned access. Sure there were times that things were not as good as perhaps Valard would have liked, that may have caused them some challenges, I have no doubt with that at all.

You know, there were spring conditions, but, you know, one cannot – one cannot forget that most of these winter rezones, we put a road through the interior of Labrador that was never planned. We put a road that you can drive a tractor-trailer through the Long Range Mountains. Valard had planned to do that with helicopter construction.

You know, we took winter zones out of different areas. So, there was a lot of strategic investment in access, to the tune of an extra, you know, \$340 million to enable Valard to be successful. Of course they need to be successful (inaudible).

MS. MUZYCHKA: Right.

MR. KEAN: So, yes, there were times that there were challenges with the road. And were there, you know – but our commitment at the end of the day was to get quality access, but it wasn't a blank cheque. You could – you need to be – there needs to be a level of reasoning and reasonableness, I think, here. And that's the key.

So in those type of situations, you know, we would make sure people would do an assessment. Sometimes there would be extra measures taken to improve conditions.

Sometimes there'd be extra bridges installed to remove turnarounds and so on.

MS. MUZYCHKA: Okay.

MR. KEAN: So I felt very comfortable with what eventually was done. But 20 – the first part – right through to September 2015 was a challenging period. Challenging from the perspective of the – some of the building conditions. Challenging from the perspective, I think, of us having a lack of an access plan from Valard, which was the common theme throughout all of this, which I think is referenced in my letter here on – that you have as Exhibit 02856, about the aspect of an access plan. And I know we have other letters that speak to that very prominently of how we can optimize access. It wasn't as optimal as it should've been.

MS. MUZYCHKA: No, and I guess from Valard's perspective, you know, as a contractor trying to bring its equipment in so that it could move, you know, heavy tower materials and so on, they were expecting a certain level and as they called it, you know, fit for purpose. And I guess from what I've read it appeared that there was some disagreement or different viewpoints from Nalcor's point of view as to what was fit for purpose versus the contractor who is trying to get their job done.

MR. KEAN: There were some differences initially, yes. And I think that really led to a point that there were extra monies invested in the road. For instance, we were working with a lot of – trying to work with, let's say, traditional wood road standards, (inaudible) to build methodologies – we ended up having to open up a tremendous lot of quarries and just do rock roads because we were building it and driving on it very quickly thereafter –

MS. MUZYCHKA: Mmm.

MR. KEAN: – hence some of the incremental investment.

So, you know, that – is there merit in some of Valard's points about all the sections of road weren't quite as good as they should've been sometimes? Sure. Is there merit that we – there were challenges with the terrain in that regard? Sure. But, fundamentally, look what was done.

Look at the effort that was put forth by Nalcor in order to enable Valard to construct the line. Did anyone ever think you'd drive a tractor-trailer through the Long Range Mountains? No, I wouldn't say.

MS. MUZYCHKA: Okay, but that doesn't (inaudible) –

MR. KEAN: So that's a testament of the effort, I guess, that was made to ensure that Valard was successful, which they were.

MS. MUZYCHKA: Yes, but it didn't come easily is what I'm suggesting. That there –

MR. KEAN: Of course.

MS. MUZYCHKA: – was a lot of discussion back and forth, and –

MR. KEAN: I –

MS. MUZYCHKA: – frustration on their part and concern for a possible delay as a result of –

MR. KEAN: But I think –

MS. MUZYCHKA: – (inaudible) access.

MR. KEAN: – I appreciate what you're saying. I think that's characteristic of the uniqueness of the project. It's – and as I described it, it's very remote, it's very logistically challenging. You're in the interior of Labrador, you know, you're totally self-reliant. You know, you're going through the Long Range Mountains, you're – you know, it's a very unique terrain, very unique project. It's a big project for – it was a big project for Valard. But thankfully they did it, you know.

But I think the things that we saw or witnessed, you know, were probably characteristic of the elements of the project. However, I would say too – you know, my role was to ensure the company's interest was represented. So sometimes the tone in a letter may be a bit more aggressive than the reader may like, but it was reflective of the need to look after Nalcor's interest.

MS. MUZYCHKA: And in that respect, it would've been – cost was the driving concern here.

MR. KEAN: Of course, and for safety, of course, environmental impact here, but cost.

MS. MUZYCHKA: Yeah.

MR. KEAN: You couldn't necessarily open up a quarry if you – if it was in an environmentally sensitive area.

MS. MUZYCHKA: Right.

MR. KEAN: So –

MS. MUZYCHKA: All right.

The next thing I want to talk about is the geotechnical information that was involved with that part of the project. I understand that the geotechnical conditions were worse than were expected and contributed to the cost overrun with the HVDC transmission line and the right-of-way access contract. Is that correct?

MR. KEAN: The geotechnical conditions, yes, were different than anticipated on the DC transmission line. That's correct.

MS. MUZYCHKA: Okay –

MR. KEAN: And that did lead to the use of – the expending of extra money on access because of the lack of suitable material for access building, as well as installing different foundations.

MS. MUZYCHKA: Right –

MR. KEAN: Not always more expensive, but sometimes different.

MS. MUZYCHKA: Okay.

Why was the geotechnical information that was available not sufficient for the purpose of the project?

MR. KEAN: So the approach taken with geotechnical information on the DC line mirrors that what was taken on the AC line, which mirrors what was taken on the Maritime Link;

the 735 lines to – you know, leading from Churchill Falls to Quebec; you know, the recently completed 267, T-line 267; and all traditional lines in Newfoundland and Labrador. It's the same premise. So the premise therein was that you would collect information to support the design of a family of foundations – and that was done in 2008 and 2009 by AMEC.

MS. MUZYCHKA: Mm-hmm.

MR. KEAN: And that involved the – collecting a lot – doing some test pitting, some various types of rock strength testing, bog probing, some drilling to collect enough data to allow for SNC-Lavalin, as engineers, to design a family of foundations. So enough soil conditions characteristic of the type of conditions.

AMEC, in that regard, produced various studies and they provided what was referred to as a baseline geotechnical report and the word “desktop” is likely in that. And why is the word “desktop” in that? It's because it was a – it's something that was eventually consolidated at someone's desk to allow it with the field programs, the review of the lidar mapping data, any other data that may have come from the Geological Survey of Canada or the recently constructed Trans-Labrador Highway, as an example, and any other data. So it's a consolidation of that. And that study, that desktop study, provided the basis and viewpoint as to what the quantum – or quantity of each type of foundation conditions could expect to be. And the same one was done for the AC transmission line.

MS. MUZYCHKA: Right, but we're talking about the DC line now.

MR. KEAN: Yes, I appreciate that, but context it's very important: same people, AMEC; same designers, SNC-Lavalin; same contractor, Valard.

MS. MUZYCHKA: Okay.

Let's look at P-01900. It's at tab 10, book 1. If we can bring that up, please, Madam Clerk.

So do you recognize that document?

MR. KEAN: Yes, that's the geotechnical baseline report that was produced.

MS. MUZYCHKA: Okay.

And this one is dated in 2012 – April of 2012 and I believe in the appendices there's reference to the AMEC study you just referred to. In fact, there is a – at page –

MR. KEAN: Yeah, AMEC –

MS. MUZYCHKA: – 13 there's the – page 13, Appendix A, there's a report from AMEC and they refer to in the information services – or sources that includes the 2008, 2009 studies you were referring to. Is that correct?

MR. KEAN: Yes.

MS. MUZYCHKA: Okay.

If we go back and look at page 5 of this report, it notes under Purpose that: "The purpose of the Geotechnical Baseline is to define the soil and rock data required for the foundation design, including the definition of the selected soil parameters to be used, the selection of the appropriate foundation type for each of the tower location and to define the geotechnical investigations to be done to reduce the level of uncertainty due to the lack of appropriate data for each tower location."

So you see that point there?

MR. KEAN: I do see that point, yeah.

MS. MUZYCHKA: Okay.

So, I guess that means that the information that was contained in the report was not sufficient in order to provide the appropriate level of certainty for predicting or forecasting what the appropriate costs should be because you don't have enough information to determine what type of tower that you would need to place in each location.

MR. KEAN: No, that – well, you could infer, but the intention of doing the geotechnical investigation was to ensure that where a – conditions were unlike what was anticipated, you could do a geotechnical investigation to

confirm the actual conditions, so you installed the right tower foundation. It's not as much about the variants on the estimate because in our base – in the SNC-Lavalin design perspective, their view of the interpretation of this data is that from a quantum perspective, you'll get ebbs and flows. But at the end of the day, we feel – SNC-Lavalin felt that the spectrum should be quite solid within a few percentage points.

MS. MUZYCHKA: Okay.

MR. KEAN: And that's reflected in the basis of estimate that was prepared.

MS. MUZYCHKA: Well let's have a look at page 75 of that exhibit. And it's under the category of recommendations for further geotechnical investigations.

And it notes in the second paragraph: "Good, high confidence level, field, geotechnical information is available only for a portion of the proposed new routing where it crosses or is on the same alignment as the original route. A large portion of the new proposed route has no field work at all; only LiDAR and air photo interpretation have been performed to date. The LiDAR images and air photos have provided a good basis for surficial geology determination, however, there are many areas away from existing construction or data points, where the surficial geology is little more than a guess. This is especially true in areas of very flat terrain. Conversely, there are areas on the LiDAR that are well defined and our confidence level is very high."

And then in the next paragraph it notes that "In order to obtain geotechnical information on the portions of the proposed route where no investigations have been performed and where there is spotty information, a full geotechnical investigation is required."

MR. KEAN: That's correct.

And the premise behind – if I may?

MS. MUZYCHKA: Yes, go ahead.

MR. KEAN: The premise here is that, from a perspective of the project, the geotechnical information would remove uncertainty as to

whether – what type of foundation would be required. However, in a – the contracting strategy was a unit-price contract, wherein a predictive viewpoint of the foundations required was to be provided. And the risk for variance on that would be addressed via the unit-price framework. So if you planned to install 25 per cent rock, and it ended up be 26 per cent rock, the incremental foundation percentage would be covered under the unit-price perspective. So from a geotechnical data gathering, it was – it became a sense of there's no value in that, only wherein the aspect of you have conditions where it is not suitable for installation of a grillage foundation.

So in – if I may, in 2012, this study was produced and that formed the basis of the estimate, the quantities that were used in the estimate. SNC-Lavalin estimators and designers viewed that the variance there would be minimal, on overall program. That's the – however, the intention was to do a further geotechnical program.

MS. MUZYCHKA: And was that undertaken?

MR. KEAN: On the transmission line, it was packaged as part of the transmission line contractor scope of work. And how that changed in 2013 is that Valard had said: Our means and methods do not require us to do that in advance of construction. We go to our sites and say – to the transmission site, and if it's not a – if rock is not visible and we have to start digging – well, if rock is not visible we know it's either earth, grillage or deep rock.

We start digging and to see if it's suitable for it, if we find rock, it's a deep rock foundation. If we don't, it's for – it could be a grillage, and if it doesn't look feasible for that, we're just going to park it and do a geotechnical program as part of the alternate foundation, the deep pile which they were responsible for.

So in that regard, during the negotiations on the AC, we had \$2 million included in the budget for geotechnical investigations for the contractor, and they said: We don't see the value in doing that in advance of construction. We will do geotechnical investigations only when required to ensure the integrity of the design of the alternate H-Pile foundation. And the cost for

that will be borne or carried in the unit price for the H-Pile.

MS. MUZYCHKA: And so that means – when you talk unit price – that the contractor is reimbursed for what actually it costs –

MR. KEAN: That's correct. So in that –

MS. MUZYCHKA: – to install.

MR. KEAN: – if it's a grillage, or earth grillage foundation, it's one price; if it's a rock foundation, it's another price. If it's a, you know – earth grillage is 10,000 (inaudible) foundation. Rock might be 50,000. A pile could be a million.

MS. MUZYCHKA: Okay.

I was just noting, too, that in that report, they identify that there are 32 towers for which there is no information available, either LiDAR or air photos. So, there was a section of the work in which you had no sense whatsoever of the geotechnical conditions.

MR. KEAN: So, my – according to this – but, again, as I stated, the SNC engineers and the estimators who put together the detailed work on the transmission line estimate viewed the uncertainty – we look holistically across 3,250 transmission sites; the variance would not be that great.

MS. MUZYCHKA: So were you comfortable, then, in going forward, you know, with the DG3 estimates for this portion of the project using this desktop geotechnical data?

MR. KEAN: Well, from a perspective of – that was an item that came up from an estimate uncertainty perspective. So, I could only look to the people that were specialists. And, you know, the viewpoint was: Well, this is – from Newfoundland and Labrador Hydro guys such as Kyle Tucker and the late Des Butt who had deep experience in this area, this was an approach that they felt comfortable with and the uncertainty, you know, was deemed to be, you know, manageable, and that was part of what was discussed as – in, you know, talking about the uncertainty in the estimate. So – and that's why the statement existed in the Basis of

Estimate about, you know, the variances should not be that great.

MS. MUZYCHKA: And the variances would be what? Like, the –?

MR. KEAN: Predicted versus actual.

MS. MUZYCHKA: Right. So, you would –?

MR. KEAN: And that statement was based upon, historically, what Hydro had seen on constructing other transmission lines in the province.

MS. MUZYCHKA: So, the DG3 estimate was understated, correct, for this project based on –?

MR. KEAN: So, the DG3 estimate had assumed a per cent of each type of earth, rock and alternate foundations as coming out of this desktop study – same thing on the AC. The AC predictions were consistent with all historical experiences, off by a few per cent. The DC predictions were off much more than that.

MS. MUZYCHKA: Okay.

So, was there (inaudible) –

MR. KEAN: So, as a result, not necessarily under budget because what we found is that predictions were to have about 55 per cent rock foundation. A rock foundation is about 5 times the price of a grillage foundation. We ended up installing a lot more grillages, so that means savings – unit-price savings.

However, we had to install not only more grillages, but we had to install more deep-pile foundations. So, what was intended to be up to a maximum of 5 per cent of H-Pile became about 10 per cent H-Pile, and each of those were quite expensive, of course.

So there were savings on going from rock to grillage, earth grillage, partially offset by the cost, of course, going from rock – or earth grillage to H-Pile.

MS. MUZYCHKA: But you make it sound like one offset the other and that exposure was mitigated, but it wasn't, in fact, 'cause there was

substantial cost overrun because of the use of different foundations than were initially planned.

MR. KEAN: Not – yes, there was cost overrun; however, some of that came back to that aspect of reliability.

The foundations were much bigger than what was in the DG3 estimate, huge, as well as the – you know, it's not only the steel that goes in the foundation, but the concrete anchors, the concrete – you know, the levelling pad and the size of the levelling pad underneath the concrete foundation and so on – the size of the wire mesh in the foundation. So there was a – numerous things that contributed to the increase in that.

MS. MUZYCHKA: Okay, but knowing –

THE COMMISSIONER: Just a second if I can, Ms. Muzychka.

Like, I'd like to think that when you start to build a transmission line, you know, when it's 1,100 kilometres in length, that when you're making your estimate, you're actually thinking about building a reliable transmission line, one that is going to be – you know, withstand the issues related to reliability.

So I'm assuming that the people whoever – who were involved in designing the estimate and did the engineering felt they had a reliable transmission line put in place. So assuming that's the case, the issue of reliability is really – for me, I'm just wondering how really important or how significant is it. Because really, what's happening here is that what you were finding is that the conditions that you were meeting along the way was – were changing such that you had to change those foundations, and that's what drove the cost, basically, to make it higher than what it was in the estimate.

MR. KEAN: But –

THE COMMISSIONER: I mean, the people who estimated this, I'm assuming, were estimating on the basis that they were gonna produce a reliable line, did they not?

MR. KEAN: Yes, Commissioner.

THE COMMISSIONER: Okay.

MR. KEAN: Yeah, one very important point, Commissioner, is that the estimate – that structures are designed for a loading of a one in 50-year weather event. That eventually ended up in a one in 500-year weather event.

THE COMMISSIONER: Right.

MR. KEAN: So as we – by that –

THE COMMISSIONER: So here we have a – so again, you look at this project, Mr. Kean, and I'm not being critical of you but I'm – what I'm trying to do is figure out – like, one of my big problems here listening to all the evidence that I'm hearing is about this estimate, trying to figure out how could this estimate be so off.

And one of the things I'm looking at is that if the person who – or the people who are doing the estimate need to understand, and I assume they did, that we needed a line that we could rely upon. I mean, you know, the idea was we needed the Muskrat Falls power. If we don't have a line that's reliable, you can't get the power down, then what are you doing for the Island portion of the province?

So whether it's a one in 50 or whether it's one in 150, they were designing a line to provide reliable power to the people of the Island portion of the province.

So what happened was is that – from my perspective, what seems to have happened is that what's driven the cost was that as things went along, you needed bigger foundations; you needed different types of foundations: some of which were cost-saving; some of which cost more. But that was the driver for the additional cost for the transmission line.

MR. KEAN: Commissioner, that's one of several drivers.

THE COMMISSIONER: Okay.

MR. KEAN: And I've provided information to Commission counsel to show, very importantly, the most objective view of the change in design comes from the tower itself, the total tonnage that was planned to be installed and the – you can look at unit size of those foundations. And the – once the design – it was featured very

prominently through the PUB discussions and the MHI reports about a one in 50-year event, a one in 150 and a one in 500.

As that reliability requirement from a weather event changed, the loading on the structure changed. As I understand it from the engineers, that meant larger structures.

So, yes, you are correct, Commissioner, in that there were some changes in the foundations. There are no debate about that. But it is also – it can be very objectively shown, through the data that exists in the design progression, that the design loading changes made a large difference on the structures – a very substantive. And, you know, I would encourage for an evaluation there. And that results in a very robust system today.

MS. MUZYCHKA: Okay. I think this is an appropriate point to take our morning break, Commissioner.

THE COMMISSIONER: Yes, okay, we'll take our – yes, we'll take our break here now. Ten minutes.

CLERK: All rise.

Recess

CLERK: All rise.

Please be seated.

THE COMMISSIONER: All right. Ms. Muzychka, when you're ready.

MS. MUZYCHKA: Thank you.

All right. So I want you to turn to Exhibit 02737, it's at tab 38, book 2.

This document is the "HVdc TL" – transmission line – "Geotechnical Risk Review," and it's dated March 30, 2016. Can you tell me whether you were involved in that document?

MR. KEAN: I was.

MS. MUZYCHKA: I take it the purpose of the document was to advise the executive as to the

status of what was happening with the transmission line project.

MR. KEAN: And – not this particular presentation, this one was prepared for a change control board meeting whereby I was seeking – the team was seeking release of contingency moneys to support the risk mitigation on the foundations. So this one was presented at change control board meeting.

MS. MUZYCHKA: Okay. Well, if we look at the page 2, which is the purpose, it seeks “approval of PCN for \$5M to support risk mitigation.”

MR. KEAN: So that would have been Mr. Harrington’s – was the approval –

MS. MUZYCHKA: Okay.

MR. KEAN: – level.

MS. MUZYCHKA: All right.

If we look at page 5, the heading on the top of that says: “Our design projections were based upon desktop geotech study which have inherent inaccuracy.” And then, I guess that’s the explanation for why you were seeking the additional funds for the risk that had materialized?

MR. KEAN: Well, it lines up with the way I structured this deck – you know, in page 3, it talks about the key messages that I was wanting to deliver and – which was really around the uncertain soil conditions challenge predictability of foundations by type. So, the way I prepared the deck to be, just for clarity, is that item one key message is reinforced by several slides that have – also have the number one on them.

But, yes, there is – the challenge with the predictability was off. We weren’t seeing the predictive nature of foundations that we saw on the AC transmission line. Things weren’t panning out.

MS. MUZYCHKA: Okay.

If we go back to page 5 –

MR. KEAN: Yes.

MS. MUZYCHKA: – in the statement, you state that the design projections were based on desktop geotechnical study that was completed during the engineering phase, and then you qualify or state that it’s given – it was done given the impracticalities and EA limitations of undertaking geo program that would increase confidence. So, to me, that’s saying: This risk was caused because we could only work with a geotechnical desktop study; otherwise, we could have had further confidence or better confidence in our estimate.

MR. KEAN: Prior to Decision Gate 3, there was, you know, discussions around potentially doing more, more work in the geotechnical world on the DC transmission line. Of course, there – in that regard, there was a lot of geotechnical work done for other elements of the project in that same period, including elements converter stations and switchyards which were done in 2013, I believe.

MS. MUZYCHKA: Okay. But why – why wouldn’t there have been an environmental assessment done which would have allowed you to –?

MR. KEAN: So, as it was informed to me during that period – of course, the project was involved in environmental assessments for both the generation project under a Joint Review Panel, and I believe the EA for the Labrador-Island Link was a comprehensive review. Two separate processes. There was concern being raised about – of course, Nalcor had a lot of legal challenges being lobbied on from various interest groups on the generation project EA. And there was some concerns being lobbied regarding the Labrador-Island Link EA, including a question about whether they should be as one.

And there was some concern being – as I understand, being made about the risk of a project-splitting challenge. And that in order to elevate that risk, there was a lot of concern being expressed by some – First Nation groups in Southern Labrador about land ownership and so on, and we had – Nalcor had consultation agreements in place with them. But it was decided that, given the extent of work that would have to be done to gather more field data for the Labrador-Island Link, particularly in Labrador,

we would not approach that. Our decision was on an executive level that – you know, that Nalcor would not endeavour to deflect any further data because it would increase the risk of project-splitting challenge and other challenges under EA.

MS. MUZYCHKA: So, the approach taken was to take your chances on the desktop plan and deal with any increases or fallout as they would occur down the line.

MR. KEAN: Yes. But as well, where geotechnical information was essential, such as in a convertor yard or the Strait of Belle Isle crossing, the footprint for those were quite a bit different than going in through the interior Labrador, less disruptive so we would execute those programs, and those were done in 2013.

MS. MUZYCHKA: Why wasn't it essential to know what geotechnical conditions you were gonna have with the transmission line, knowing that it could substantially effect the cost of that project?

MR. KEAN: Well, firstly, given the traditional knowledge of how transmission lines are typically built, and the viewpoint that the predictive nature of desktop work and the evaluation from the early field program that had been done in 2008 through 2009 should give the level of quality viewpoint that is – to get the holistic viewpoint on the estimate.

It wouldn't give you the – with a high degree of confidence in, say, 50, you know, 20 structure zones what – with definite certainty what conditions would be there, particularly where rock wasn't evident.

MS. MUZYCHKA: It'd certainly be a little bit better than a desktop study.

MR. KEAN: Well, the work we did was put into the desktop assessment.

MS. MUZYCHKA: Okay.

MR. KEAN: Which was the 110 test bits that were done.

MS. MUZYCHKA: Right.

But that wasn't sufficient according to the recommendations in the report that we just reviewed.

MR. KEAN: That was – again, this is in 2016.

MS. MUZYCHKA: Okay.

MR. KEAN: This is looking back –

MS. MUZYCHKA: Yes.

MR. KEAN: – where things were. What was known in 2012 is a lot different than what was known in 2016 –

MS. MUZYCHKA: Okay.

MR. KEAN: – in that regard. So from an assessment perspective, I'm casting back, and looking at this and saying: With what we knew at that point in time, it wasn't correct, which, you know, I think is stating the obvious.

MS. MUZYCHKA: Yes.

MR. KEAN: There was a large variance.

MS. MUZYCHKA: Yes.

MR. KEAN: However, unlike the convertor yards where you have very unique transformers being dropped in particular locations – a transmission line you can move a tower quite a bit up and down the right-of-way, or you can swing within a corridor. So, all those things were there for the transmission engineers to look at, so it gives you much more flexibility to work around. And in many cases, that's what actually occurred to avoid a deep expensive pile – you move the foundation, you move the tower 20 metres back or 20 metres ahead.

MS. MUZYCHKA: Okay.

But, we know that ultimately the amount of overage on that particular contract, because of the foundations, was significant.

MR. KEAN: I don't know if it was significant from the variance. There's a lot of overage on the contract. The nature of that overage, I can't – I don't know all the details of it. I know the

overage up to the point at time that I left, as well as potential items.

From a quantum perspective, it would've been – overage on foundations would've been probably in that 5 per cent of contract value, so maybe \$40 million of the – on top of the \$810 million.

MS. MUZYCHKA: Okay.

MR. KEAN: Because as I indicated, we were installing a lot less grillage – rock foundations and installing a lot more grillage foundations, which were cheaper as well.

MS. MUZYCHKA: Okay. I just –

MR. KEAN: So probably 5 per cent was my understanding.

MS. MUZYCHKA: Was your understanding. And evidence from Mr. Ducey and Mr. Williams was such that the ultimate settlement related, in a large part, to unit-price part of the contract?

MR. KEAN: The – there were a number – I have no idea what's in the ultimate settlement. I do know that when I left, we were forecasting – the contract started at 809; we were forecasting it at \$896 million. I believe – it went up 145 after I left. That's what I know –

MS. MUZYCHKA: Okay.

MR. KEAN: – from the last cost report that I gave –

MS. MUZYCHKA: All right.

MR. KEAN: – which was the equivalent to the settlement agreement.

MS. MUZYCHKA: I just want to draw your attention to page 7 of the exhibit. And at that point you acknowledge that the DG3 Material Estimate for – did not adequately account for variability. And the foundation – I guess that was part of the difficulty with not having sufficient geotechnical information at the outset for your –

MR. KEAN: (Inaudible.)

MS. MUZYCHKA: – estimation process.

MR. KEAN: Yeah, I would attribute it to whether it was sufficient or the accuracy of the geotechnical information. Things, particularly, became much more difficult in the Segment 1, Segment 2 Labrador portion. I think slide 8 gives – can provide with a pretty clear – what we were seeing in Labrador, as an example. Segment 1 and 2 are indicating more grillage than rock. So the plan was 33 per cent grillage; we were forecasting 49 per cent of all locations to be now grillage.

So while the grillage foundation itself is cheaper, sometimes there's challenges with the grillage foundation installation that we did see. But, you know, our quantity projections of 1 per cent pile, I'm saying here, is not consistent with field conditions. We're installing a lot more pile. And I think, you know, it was – you know, we said it could go up to 5 per cent, but I think we were seeing in a range of – I think in looking at the pie chart there, purple is pile, it was showing for tangent towers up to 7 per cent and up to 12 per cent of dead-end towers.

So, you know, we're – the conditions were different. They were more – rock foundation is a more predictable bearing surface. Soil can be of varying classifications and quality. Some were quite suitable for standard grillage; some was not. And – page 9, I just give people a fast fact there to let them know that foundations – in that grey box, Mr. Commissioner – it's about one-third the cost of Valard's price as a rule of thumb.

And this gives people a viewpoint from a tangent tower, which is, basically, the guy tower with guy wires versus – it's one leg. We have those and we have what's called a self-support, which has four legs. So for a tangent tower that has a single pole mast and guys, you know – a grillage we can install for about \$13,500, but if that becomes an H-Pile because of site characteristics, you know, it's eight times – you know, it's well – it's more than that. It's almost – yeah, it's about eight times that.

MS. MUZYCHKA: Two hundred and fifteen thousand dollars.

MR. KEAN: You know, it's –

MS. MUZYCHKA: It's a big difference.

MR. KEAN: Sorry, my math is not so good today. Yes, it's a huge difference.

MS. MUZYCHKA: Huge difference.

MR. KEAN: So, of course –

MS. MUZYCHKA: So if you're off by 10 of these –

MR. KEAN: Yes.

MS. MUZYCHKA: – it might not seem like a lot on 13,000, but if you're off on 10 at \$215,000, you're into the millions.

MR. KEAN: Likewise, if your rock is now expected to be 50 per cent, and the rock foundations are 25 per cent – or actually, I think, it was around 30 – you're not installing as many of the \$80,000 foundations, but they're being traded off for either 13,000 or 27, or it could be a \$215,000 foundation.

So there's a whole mix of things that was occurring.

MS. MUZYCHKA: Okay.

MR. KEAN: At the end of the day, there was an increase in total cost –

MS. MUZYCHKA: Okay.

MR. KEAN: – driven by foundations. And I – that was about 5 per cent – my understanding of contract value – and –across those foundation spreads.

MS. MUZYCHKA: And we can explain that by the lack of adequate geotechnical information that was available when the estimate was made in DG3, correct?

MR. KEAN: No, I don't agree with that. My understanding would be the large variance – the unexpected variance. So what could have been done to improve that predictability? Sure, if there was more information, it would improve that. But would that – I guess what's so surprising – I think very important to note on this – is that for the section in Labrador, the same area that Valard had made comment about the access conditions earlier – the Labrador

section for the first 250 kilometres coming from Muskrat Falls were probably the most difficult and unpredictable conditions on the entire line. And that was the area that Valard started in.

So much so that we would have a self-support tower – that's a four-legged, so meaning four foundations. And in some cases the four legs would not be the same type foundation. Two might be rock; two might be grillage. One could be a pile. In some – so, I don't know if any amount – the variance and variability was such that, you know, you'd have to do an extreme amount of geotechnical collection. And it's not possible to do – to actually physically dig the hole up and leave it. You can't – you can only do a borehole – the only thing to do – and you'd have to do that for every location.

So why – there were challenges with – from an environmental assessment to do the borehole. Plus, it's \$5,000 to \$7,000 to do a borehole. It only costs 13 to install a grillage foundation. So the math doesn't work out to be doing that many up front.

MS. MUZYCHKA: Okay.

So you're prepared, as I said earlier, to take the risk on the inadequate information and pick it up as you went along?

MR. KEAN: And that's where we looked to our contract form and structure on a unit-price basis, which is quite typical in this industry, to look at that, to look at where there's geotechnical uncertainty. Well, first of all, does the contractor have the means and methods to work and manage around that geotechnical uncertainty? Valard said they did. It was shown on the AC line that were – locations that they couldn't install the grillage, they would request a borehole to be done, or they would undertake it and install it. The costs would be part of the H-Pile.

So does the contractor have that? Do you then have the contract form to manage that via unit price? If we had said to Valard, well, you take the entire foundation risk up front, you know, they – the cost could have been anywhere 'cause they would have to bear that risk themselves entirely.

MS. MUZYCHKA: And they weren't gonna do that –

MR. KEAN: (Inaudible.)

MS. MUZYCHKA: – based on the limited geotechnical information.

MR. KEAN: I don't think it's prudent for an owner to request that. And I think I may have indicated in discovery that I was recently bidding a transmission job that an owner wished that to be done. It was a 1,600-kilometre job that the owner had no geotechnical – not one borehole, not one test pit. Not even – so the only thing they had was lidar, yet they're asking the contractor to take all the geotechnical risk. Bigger program.

So, I don't think that was prudent, either. So I guess from the perspective – from a balancing perspective back to that aspect of risk allocation we talked about early, we'd collect as much data as we thought was reasonable; we have a unit-price framework to allow for that – keep the contractor whole, such that his costs is covered. And if the conditions turn out to be different, do we have the means and methods to manage that?

And at the end of the day, yes, there – we – there was more money spent on foundations than what was planned in the DG3 estimate, and there is a cost for that. And that cost had to be borne by the project. And – but in – most importantly is we have confidence in the foundation that was selected and installed.

MS. MUZYCHKA: That's well and good, but, ultimately, the increase in cost has to be borne by the Province of Newfoundland. And this could have been either better budgeted from the outset or an appropriate contingency recognized to cover off that risk so that wouldn't have been a surprise at the end.

MR. KEAN: So I can only look to those that had the expertise in the area. This – from my perspective, prior to DG3, this was not my – you know, the group had, the engineers, the SNC-Lavalin construction people and so on had done a best view of this. And they were asked for input as part of the QRA.

MS. MUZYCHKA: Okay.

MR. KEAN: And I – and back to my last point was that we saw such variance. I don't know what you – you know, you could have put a big amount, sure. But hindsight is a marvelous benefit. But I don't know if – with – if I look at the AC, predictions were quite good – same methodology. They were off within 5 per cent on the AC transmission line between Muskrat and Churchill. They were off very little on the T-line 267 between Bay d'Espoir and Chapel Arm. I believe the LIL in Labrador was – had some unique anomalies in the geotechnical characteristics, is what I've heard.

MS. MUZYCHKA: Okay.

Let's turn to P-01769, Madam Clerk. It's at tab 52 of binder 3. And we're gonna go to page 40, please. Page 40, please. Yes. Thank you. Scroll down to the bottom where it says Geotechnical Conditions.

This document – tab 52 – is a report, Muskrat Falls Project Post Sanction. It's a briefing note. Were you involved in the preparation of that document?

MR. KEAN: I provided a lot of the input, yes.

MS. MUZYCHKA: Okay.

And – so if we look at the section there on the screen regarding geotechnical conditions, there is a statement that the geotechnical conditions led to differences in – sorry – “The differences in the actual geotechnical conditions versus the geotechnical baseline conditions used for the cost estimate in 2012, resulted in significant change to the planned versus actual foundations types installed, with a significant increase in solid foundations. Where poor soil conditions were identified, alternate H-pile foundations were utilized at a frequency of nearly twice the original plan, adding significant cost to the foundation program ... particularly for the HVdc line.”

So that's a lot stronger in terms of the impact than what you've been indicating to us –

MR. KEAN: (Inaudible.)

MS. MUZYCHKA: – this morning. And, you know, this talks about it being significant. And it

states that it's the result of not having the appropriate data when making the original estimate.

MR. KEAN: So, I indicated about 5 per cent, plus the – on Valard's contract. We also had the material side, so Valard wasn't responsible for the material and the tower shoes and so on. So, you know, from a perspective of overall cost increase, 900 million – 40 million for Valard, 10 to 20 on material, so it's a significant element of that, yes. And I indicated it was in that – I showed the pie-charts reference there; it's about 10 to 11 per cent overall of the total foundations are H-Pile, so there's no doubt there's change.

MS. MUZYCHKA: Okay, but it wasn't just the towers themselves. It also resulted in Nalcor having to order additional material and spares. And I think that's shown on Exhibit 02737 at page 10.

MR. KEAN: So the premise for all of the transmission tower foundation material was that there would be, unlike the towers themselves, which are known you're gonna put X-type tower and A, B or C at various locations, the viewpoint would be we would have – we would order a certain initial order of transmission foundations, based upon the geotechnical-based desktop study you referenced, and as conditions – as we progressed on the line we would – that subsequent orders would be true-ups; if you're not using so much of one but using more of the other, you need to adjust your quantity mix.

So, that was always intended from a perspective of the true-up. However, as we got into more of the aspect of the needing a lot more grillage than a rock foundation, the grillage material, as shown there as S1 to S4 spares, which is third or fourth line from the bottom –

MS. MUZYCHKA: Right.

MR. KEAN: – that's grillage, effectively, in grillage foundations. The material cost for grillage foundation is a lot more than a rock foundation. So we ended up not using a lot of rock foundations, as what was – so there was unused rock material and more expensive grillage foundation material installed.

And then, of course, there's a note there saying pile foundation shoes, first order. You know, we had to start ordering. Then, extra pile foundation shoes. So as more deep pile, or these solid foundations as they're referred to, are ordered – are installed, we needed to order these – the shoe, which is the joint between the pile itself and the tower.

MS. MUZYCHKA: Okay.

All right. On the right-of-way, I understand that part of the increase in cost resulted from a delay in getting the project started. It was planned over four winters, and instead it – there was only three winters.

Is that correct?

MR. KEAN: That is correct.

MS. MUZYCHKA: Okay.

MR. KEAN: It influenced the access in the context of the – I mentioned earlier the DG3 estimate was predicated upon a construction strategy developed by SNC-Lavalin and, you know, reviewed and agreed with Nalcor that the – we would construct sections of the line in the interior of Labrador during winter, and sections of the eastern Newfoundland Terra Nova area in winter and some Northern Peninsula sections.

And of course, the viability of that, you know it was certainly, you know, as we lost the one winter, you know, you started to look at the viability of that given the unpredictability of winter then. So it wouldn't be prudent. So we did try for a winter construction zone in the interior of Labrador. We built a winter road one year but, you know, with the change in foundation type there, things didn't work out. We ended up having to rebuild that for summer-only access.

MS. MUZYCHKA: There was also issues, though, related to geotechnical information that was required and delays in getting environmental approval, is that correct? With respect to the right-of-way?

MR. KEAN: Well, the – not sure I ...

MS. MUZYCHKA: Okay, well if we look at page 41 of Exhibit 01769, which is at Tab 52.

MR. KEAN: Yes.

MS. MUZYCHKA: Near the bottom of the page, there's a discussion that Nalcor felt that Valard's poor management of the work on the HVDC line contributed significantly to the cost growth of access works, while other cost growth could be attributed to – both to the poor on-site geotechnical conditions, which were unfavourable and in –

MR. KEAN: That's –

MS. MUZYCHKA: That's more for the conditions, rather than a report, is that correct?

MR. KEAN: That's the road-building conditions, you know, and I think that was first factored in – featured the Oversight Committee, the Government of Newfoundland and Labrador, Oversight Committee report of 2015, September 2015 talks about this issue that we were discovering.

That's really where – 2015 was a tough year on right-of-way work. We were in some of the most difficult terrain. It was also tough, as I would say, for Valard's foundation activity, consistent with learning-curve process. So it was a tough year, start – they – tough – they started in tough locations and really going through the interior of Labrador, the conditions were different than was anticipated, much different than what the road-building conditions were on the Trans-Labrador Highway, as an example. And we were using the same contractor, Johnson's.

MS. MUZYCHKA: Okay.

MR. KEAN: So the conditions were tough. And I will say, you know, what I – on page 43 of the same binder, while it's here I guess, it's hard to quantify the impact of all these. And I just – when I was asked to provide some input to this I created – I just said – I created a fishbone diagram and just to say, you know, my own view was that there were seven major contributing causes to the cost growth on the transmission system and that each of those main causes – like compressed schedule, or conductor proud stranding, or geotechnical conditions –

had various contributing factors. And that it's hard to ring fence – you know, certainly if you did enough of detailed forensic review you could. But each of these items contributed to that cost growth.

That's even like right-of-way access, which is shown down in the bottom there. You know, there was some challenge with Valard management, yes, of course. But the reality is we had a lot of difficult conditions. We had inefficiencies on means and methods because of the conditions. We had challenges with getting quarry permits. We had the need to do more semi-permanent access to install more bridges. So, you know, no point in saying that all the right-of-way and access works is because of Valard's management. That's not – that wouldn't be prudent. There's a number of factors that come together.

MS. MUZYCHKA: Okay.

MR. KEAN: So I just – this chart is to try to highlight what some of the contributing factors are.

MS. MUZYCHKA: All right. There's seven of them in total that you've listed.

All right.

One of the other things that we heard from Valard is the difficulty in the relationship between yourself and the Valard management individuals. We talked about that briefly. But when – after you left the project, Mr. Ducey and Mr. Williams indicated that the tone of the relationship changed. And I don't know what your sense is. I'd just give you an opportunity to comment on that.

MR. KEAN: Well, of course, I can't really comment as to, you know, how the tone changed when I wasn't there. Of course, I only know how the tone changed while I was there.

MS. MUZYCHKA: Right.

MR. KEAN: And so –

MS. MUZYCHKA: But was it your philosophy to keep contractors' feet to the fire?

MR. KEAN: Yes.

MS. MUZYCHKA: And –

MR. KEAN: However, you know, I think – so I always – so if you looked at any organization, there's various roles that have to be played in delivering this. So while I was the company representative in terms of various aspects of the administration of the agreement, I wasn't in the field, I wasn't involved in the operational decision activities. That was – we had competent transmission people involved in that. I had a right-of-way and access manager who was making the decisions on where to install the right-of-way. You know, how to – what access improvements to be made.

You know, so we had – there was a group – there was a full myriad of individuals involved here. So keeping ones – the contractors' feet to the fire may have been a philosophy, but at the same time, what are you doing? You're approving concession requests. The contractor may have wanted to adjust deviations – or have deviations to the technical specification. So when I was there we approved 70 concessions to the specification to make contractors construct (inaudible) easier. So the engineers would approve it, and those got approved. We ordered, you know, a surplus of material because of loss in snow. You know, we – there's investment in a right-of-way. You know, the removal of turnaround points on the Island and so on for bridging. So –

MS. MUZYCHKA: But that doesn't tell us about the relationship issues now.

MR. KEAN: Sure.

So from relationship, Commissioner, I – what I did initially to ensure it was a good relationship, is that I took the lead at establishing a steering committee between Valard and Nalcor for the DC and AC transmission projects. I think it was probably the second project steering committee with a contractor. And I defined KPIs, five KPIs that I wished my executive and Quanta Valard's executive to discuss. Those include how we are adhering to the values that are in the contract. Are we being team players? You know, is the Valard machine coming to the project? So I set up that group, you know, we identified and then

I wrote a charter, the KPIs, for these guys to meet together and talk about these things. So if there are issues with relationships at a working level, they're talked about and hopefully resolved.

So I've never heard while the time I was there, probably up to the time of bifurcation, of any concern regarding my approach with Valard. Everyone was well aware of where things were. We had, you know, the AC contract had been just about concluded. So feet to the fire, so when you have concrete quality issues on the HVAC line and you have missing records for 400 transmission towers, do you not say to the contractor: Hey, you need to give us those records. I can't pay for that unless we are certain that the concrete strength is suitable; that we have appropriate air entrainment. So is that holding feet to the fire?

I guess, I felt it was my obligation to enforce the requirements underneath the contract. Now, sure from a perspective (inaudible), I guess what I did to provide an assurance mechanism of that, I would have – you know, I had a commercial team that was involved in terms of looking at things, including an attorney, including a claims consultant, Mr. Bruce Hallock as an example. I had, you know, a commercial manager to have a look, you know, have their own assessment of how the things are going.

So, you know, I guess it's a matter of perception as to how they felt things were going. You know, things – I think we awarded the contract in August 2014 and started work. Of course there were a lot of teething pains. You know, we never had all the – every tower available initially and that's no – that's pretty well known we had some problems with the tower supplier. There was some challenge with access condition, you know that.

MS. MUZYCHKA: Okay.

Well look – let's have a look at Exhibit P-03167. It's at tab 43 of book 2.

THE COMMISSIONER: What was the number again, sorry?

MS. MUZYCHKA: Tab 43, Exhibit 03167.

THE COMMISSIONER: Thank you.

MS. MUZYCHKA: If we go to page 11, what we have is a letter from Valard to you dated June 7, 2016.

And in that letter, which is a number of pages, four or five pages, the – one of the items, just as an example, on page 13 is some issues with costs associated with reimbursable items. I won't get into all of the details, but the "Contractor encourages Company" – and this is at the last paragraph – "to be proactive in taking a solution-focused approach" – to the numbers of issues – and, again, I won't go through them all – "and encourages a more holistic and less cost-centric approach to decision-making moving forward. This approach will result in a 'win-win' for all stakeholders." So that's page 5 of 5. There you go.

So I take it then that after this letter was delivered to you there was some discussion with yourself and Mr. MacIsaac about setting up a meeting with Valard executives in response to that letter to try and discuss the way forward?

MR. KEAN: I don't know if that – no, I don't think the – there was a meeting with Valard in that, you know, July period – late July period, but it would've been – it came out of the initial meeting that Valard had with Stan Marshall on the 16th of July, I think. So, you know, there were a lot of items open with Valard. So from context-wise, in the period of 2015 we started to take a more active role doing a lot of geotechnical rig work. We knew there were challenges, so we mobilized a geotechnical rig to get ahead of Valard. Then, in the winter of 2016, we decided to do test pitting ourselves through the interior of Labrador with our own expertise from Qualitas – SNC-Lavalin Qualitas out of Quebec – to do some test pitting throughout the interior of Labrador in order to improve the predictability.

So this is winter of 2016 before the arrival of Mr. MacIsaac. And I think we had two geotechnical bore rig – borehole rigs going pretty steadily.

MS. MUZYCHKA: Okay.

MR. KEAN: So there were different issues, there was numerous letters back and forth in exchange between the parties on the interpretation on what is the conditions, what are the baseline geotechnical conditions. Water was always a prominent issue.

MS. MUZYCHKA: Sure.

Just to stop you there, Mr. Kean, the point I'm trying to make from this exhibit is essentially that you had received a letter outlining a number of different issues, and Valard was encouraging you, or Nalcor, to come together to try and reach a resolution. As part of that, there was a meeting with Valard which involved yourself and Mr. MacIsaac.

And if you want to skim through the exchange of emails between yourself and Mr. MacIsaac subsequently, I'll just paraphrase my understanding of what took place. Is that on the meeting that was held there was a discussion of trying to come up with a collaborative approach. And I believe the meeting was on the 22nd day of July to try and work through the various items. Do you recall that?

MR. KEAN: There was a meeting, yes, in St. John's.

MS. MUZYCHKA: Okay.

And that later that day you followed up with a letter, unbeknownst to Mr. MacIsaac – that's on page 6 of that exhibit – in which you have responded in five or six pages, which essentially revert back to the specific contract points and represented an approach which is more of a hard line, I suppose, than in contrast to the collaborative approach that had begun, say, that morning in discussions with the Valard executives and yourself and Mr. MacIsaac. Is that a fair representation?

MR. KEAN: The – I think the context is we received a letter from Valard on the 10th of June, a response – or the 7th of June. We prepared a response assessment. I think there was various site visits in that late June, early July.

Coincidentally, the letter went out from Valard from document control the same day – or from

Nalcor – signed by me on the 22nd of July which was the same day that we had the meeting with Valard that you're referring to.

MS. MUZYCHKA: And did you sign that letter that day?

MR. KEAN: No. I signed the letter before.

MS. MUZYCHKA: And –

MR. KEAN: That morning.

MS. MUZYCHKA: That morning?

MR. KEAN: Or the day before, one of it.

MS. MUZYCHKA: Okay.

Just have a look at page 4 of the exhibit. And this is Mr. MacIsaac and he says at paragraph 3: "the note sent Friday, was ill timed in its following the meeting and has had the effect of undermining our message on a reset, recommitting to the relationship and the work together for a strong finish."

Do you recall receiving that email?

MR. KEAN: Yes, yeah.

MS. MUZYCHKA: Okay.

MR. KEAN: I recall a lot of discussions around that email.

MS. MUZYCHKA: Okay. And –

MR. KEAN: And as I said, the letter was signed before it was prepared. And, you know, as I – if you want to go with document control, they'd have the actual evidence.

MS. MUZYCHKA: Okay.

You do indicate that on page 3 in response to Mr. MacIsaac, and you state that the "letter was prepared in the days leading up to my signature on in the early AM of Friday, 22-July and was subsequently issued by our Document Control that afternoon, thus following any discussions and agreements that may of arisen in the meeting with Quanta – Valard." So that's your statement.

MR. KEAN: And a subsequent – I prepared a subsequent – subsequent to the meeting with Quanta, I prepared a letter, I think that was issued around a few days after, summarizing the outcomes of that meeting. So that – the letter you were referring to here that's noted as the 22nd of July, that's not the letter that was issued summarizing the outcomes of the meeting.

MS. MUZYCHKA: No, no. It was –

MR. KEAN: It's just –

MS. MUZYCHKA: – independent of that meeting.

MR. KEAN: Yes. I just wanted to put – make sure that's clear.

MS. MUZYCHKA: Yes.

And so if you look then at Mr. MacIsaac's email at page 1, he's taking issue with your statement that you signed it that morning and it went through document control. And he states that it feels more than a coincidence and he's certainly taking issue. And he's writing to Jim Keating at this point. You're not copied on that letter.

MR. KEAN: Well, Mr. MacIsaac can speak for himself, I guess, in that regard.

MS. MUZYCHKA: Yes.

MR. KEAN: And, you know, I've made it very clear that, you know, my views on, you know, ideology difference and so on. We have an autocratic leadership style that's arrived at the project and, you know, regard to business processes.

MS. MUZYCHKA: Okay.

But certainly you would agree, though, that a letter which didn't reflect the collaborative approach that had been expressed in a morning meeting wasn't reflected in the letter that subsequently went out to Valard that evening.

MR. KEAN: So I can't – you know, I think the tone of the letter is fairly self-evident.

MS. MUZYCHKA: Mm-hmm.

MR. KEAN: The tone of the letter, you know – what I do know is that the letter was prepared in the weeks before it was issued by a team. The details of which – that’s not my – I would have signed the letter, but it was the commercial manager who actually wrote the letter. I would have reviewed it, of course, and signed it. It was signed before the meeting occurred with Valard.

I mean, I think I may have indicated in Phase 1 I was in the office at 6:30. The letters went to – our process from a letter perspective is that once a letter was approved it was circulated and initialled by all the people in – within the team that had – the project manager, the contracts administrator, the commercial manager, the attorney that was on the file. Then it came to me for final review and signing. Then it left my desk and went to document control for issue under Aconex.

So I do know that the letter was prepared in the days coming up to that and the research was done. I signed it that morning – or the evening before, I can’t remember what it was.

MS. MUZYCHKA: But why would you have done that, knowing that you had a meeting lined up with the – as Mr. MacIsaac puts it, the top-to-top meeting intended to take on the issues and move us forward – is what Mr. MacIsaac says. Why would you sign a letter that morning in which you’re going to put a hard line on – in response to a letter they had written a month earlier – more than a month earlier? Like, why wouldn’t you say: I’m going to hold this and we’re going to see what this meeting is going to yield?

MR. KEAN: I guess from the perspective I thought it was important to get the information out. The letter had been sitting around. It’s been drafted since the 7th of June the first letter came in. So it was – the letter – all letters have a date by which they should be responded.

From the perspective of that day’s meeting, I had no indication from Mr. MacIsaac, since Mr. – this was the first time Mr. MacIsaac had met with them. Up to that point in time he was going to give them the gears, you know –

MS. MUZYCHKA: Did you run it past Mr. MacIsaac and say: I’m going to send this letter

in response? I know we’re meeting with them shortly.

MR. KEAN: No, I did not.

MS. MUZYCHKA: No. So it –

MR. KEAN: I did not feel the need.

MS. MUZYCHKA: Okay, but you do realize or appreciate why Mr. MacIsaac felt he had been undermined when, after taking position in the morning, you followed up in the afternoon with a different viewpoint from yourself.

MR. KEAN: So I – you know, I appreciate the comments he’s stating and I just know that Mr. MacIsaac messaged that upward accordingly.

MS. MUZYCHKA: Okay.

MR. KEAN: Let’s put it that way.

MS. MUZYCHKA: And he was your superior in this organization?

MR. KEAN: Yes and I had spent, you know, faithfully, providing him updates in the months before this, before any announcement had been made on bifurcation. So, you know, Mr. – as I said – Mr. MacIsaac had an autocratic leadership style that I didn’t subscribe to and that’s the reason – a large part of the reason I left.

MS. MUZYCHKA: All right.

Now, with the project having gone over budget I understand you prepared some tables, which are at P-03195 at tab 82 – let’s see – binder 4. This Exhibit 03195 is extremely difficult to read; we might have to blow up sections of it. But perhaps you can just simply outline what it is that you were identifying or relaying here.

MR. KEAN: Sure.

I guess in Phase 1 I was asked – and I think you asked me again today – did I have input into these binders. And I said, yes, I provided significant input into the analysis that went in to eventually shape the binders, the five binders.

Of course, one of that was try to understand and communicate what were the key events that

were influencing things. And, of course, I think I indicated I spent about a couple hundred hours of work for Nalcor putting together my inputs to these binders. So it's a cursory review trying to set forth what were the major events – in this case for the transmission line – that occurred.

And what it shows is a period of time from May 2012 through to August 2017 and it shows how the project cost changed during that period of time and what may be some of the, what I consider to be, triggering events or significant events that unfolded that influenced the outcome of the project.

Now, as you can appreciate there's a lot of things that occur but this is just to point in the direction of some of the things. It's not a root-cause investigation, it's – you know, these are letters or project change notices or DANs that you can look to, to give you a bit of clarity or contract awards or bid notifications.

So the black solid line that looks like steps is the portion of either the DG3 original control budget, starting – at first, it shows DG3 original control budget equals \$1.33 billion. And it just shows the incremental proportion of each successive AFE through AFE 1, 2, 3, and 4 and 5, the proportion or amount in that AFE that was allocated for overland transmission.

MS. MUZYCHKA: Where did that number end ultimately?

MR. KEAN: That's – on the far right it's 2.23 which gives this \$900 million which I referred to in the fishbone diagram.

MS. MUZYCHKA: Okay.

Let's have a look at P-03233 and that's at tab 86.

CLERK: Thirty-two.

MS. MUZYCHKA: 03233, please.

Again, it's a little difficult to read unless you really enlarge it.

Is this a document that you prepared?

MR. KEAN: This is the – yes, it is.

This is the document that gives the data, the step chart that we just looked at – the steps in the chart. So the total –

MS. MUZYCHKA: So they're related.

MR. KEAN: Yeah, that's how the number comes up with.

MS. MUZYCHKA: Okay.

And that outlines the cost changes of each of the different components of the transmission line –

MR. KEAN: That –

MS. MUZYCHKA: – project.

MR. KEAN: That's correct, from both – at the top would be the two big construction contracts awarded to Valard. And beneath that would be – of course, in the top one, CT0327, incorporates the other contracts for right-of-way clearing and access construction. There's a lot of material contracts and I think right at the bottom is the right of – the reservoir clearing which is not transmission, but it was an area that was under my oversight.

MS. MUZYCHKA: Okay.

MR. KEAN: And it shows, basically, that the value of each contract in the DG3 budget of \$6.2 billion, Commissioner, that was – so what they were initially estimated at and how those contracts – the funding level for those contracts changed over time throughout those successive AFEs, okay?

MS. MUZYCHKA: Okay. And so that, in the lower right-hand corner, we've got the total of the cost overrun that you've identified?

MR. KEAN: Which is 896 or –

MS. MUZYCHKA: \$900 million.

MR. KEAN: – \$900 million.

MS. MUZYCHKA: Okay.

MR. KEAN: And this just breaks it down across these packages. Again, it's just to help point – provide people clarity as to how the

values changed throughout these and over time. And when I – I think you'll note on the top there it says December of 2016 which was when I left.

The package, CT0327, was at \$1.4 billion or 1.33 – 1.399, so that's Valard and all the right-of-way contracting. And I describe the status of things earlier, where that was; the right-of-way had been complete, basically. And that went – I guess the final AFE is the \$1.545 billion, which the incremental amount reflects, as I understand it from reading press releases, that that's the value of the settlement agreement that was done with Valard.

MS. MUZYCHKA: Okay. And you weren't involved in that, obviously, because you were no longer with Nalcor.

MR. KEAN: No, I was not involved.

MS. MUZYCHKA: Okay.

When we interviewed you recently, you expressed surprise as to the amount of the settlement that we put in the range of \$245 million?

MR. KEAN: I did because my idea was that I don't think that's truly a characterization of what the settlement was, I guess, from – I go back to when I left there were a number of change orders either approved that increased the value of the Valard contract or were in the works, such as stringing suspension as an example; the amount had been approved in November of \$27.6 million to do the restringing. And that was working its way through so that was a legitimate change to Valard's contract.

So it seems to be in the Grant Thornton report it's all buckled into the 245 for a settlement, but I'm just –

MS. MUZYCHKA: But you think it might be less.

MR. KEAN: Yes, I'm just trying to differentiate between what I understood Mr. Marshall said in June of 2017 in AFE 5 release. He said there's \$140 million for Valard settlement is what the press release said –

MS. MUZYCHKA: Okay.

MR. KEAN: – which aligns up with these numbers.

MS. MUZYCHKA: Yes.

MR. KEAN: And that – so that would've been, I guess, the settlement of a claim that Valard brought forward, as I understand it.

MS. MUZYCHKA: Okay.

So I gather you must have been aware that Valard was going to be submitting a claim since at least 2015 when they sent that letter to you outlining, you know, possible delay claim for lack of geotechnical issues, access issues, et cetera?

MR. KEAN: So I was – no, I just – I had a suspicion and I made that suspicion to be known. Valard didn't – had never stated when I was there that they were submitting a claim.

MS. MUZYCHKA: Did they ever submit change notices that weren't approved?

MR. KEAN: There were change notices under negotiation, yes.

MS. MUZYCHKA: Okay.

MR. KEAN: And they had made change requests for a couple things – I think on rock busting, as an example – that we were working through and – yes.

MS. MUZYCHKA: Okay. So you –

MR. KEAN: But –

MS. MUZYCHKA: – were aware that there was going to be a discussion at some point –

MR. KEAN: Of course.

MS. MUZYCHKA: – at the end of the contract –

MR. KEAN: And we had brought –

MS. MUZYCHKA: – which could result in Nalcor having to pay money to Valard over and above the specified contract price.

MR. KEAN: And that – and we had quantified and included those items in the forecast when I left in December of 2016, such as items related to rock busting, items related to the restringing. Those were in that \$1.399-billion value there, of – I guess that, you know, that – of that which 456 is right-of-way clearing but, you know, that number included, you know, provision for those things.

So I guess, yes, I was always aware that there could be a risk of a claim and I made all parties aware of that, including the Oversight Committee. In January of 2016 I remember giving them a presentation where I talked about the risk of a geotechnical claim. I called it Valard's ability to successfully position a geotechnical claim.

MS. MUZYCHKA: And did you quantify that risk?

MR. KEAN: Through the DG – through the 2016 QRA analysis, which was done, we had looked at what we thought was the validity of that. And we had looked at it from a perspective of – with our claims consultant internally looking at this notionally to say, well, what – how will we think things are going.

So we looked at – of course, a contractor has to be able to look at – in a claim he has to have causation; he has to have entitlement, and there has to be damages. And what we looked at is that we may have some opportunity to give him compensable time. So giving him reprieve on LDs, waiving LDs. So that became – in addition to having, I think it was, so many million in the 2016 QRA for geotechnical rock busting and some – you know, some monies there for alternate foundations, we were – it was predicated upon no recovery of LDs but extending the schedule.

Why did we agree to that, you may ask? Why did we think that was a reasonable argument? And it really came down to the point of looking at the nature of what we thought the claim might be. As well, we knew that from a perspective of the project, there was opportunity to give Valard plenty of, you know, time extension because we did not think – the risk analysis revealed that there were three critical paths on the transmission system: one was the Churchill Falls

switchyard; one was the converters, and one was the line. And we thought the converters would be the slowest thing.

No point of accelerating a line, so you can give Valard plenty of time, so we would waive LDs. So that was a philosophy point that was our articulated in the 2016 QRA, and I took forward in the initial briefing that I had with Mr. Marshall in the, I think, June – mid-June 2016 when he arrived.

MS. MUZYCHKA: Okay.

And then – at some point later, I understand that there was no allowance made for settlement of the Valard claim or potential claim when the – I mean, there's some in the 2016 QRA, but I gather that there was some surprise as to the amount of claim that was, we'll say, sitting on your desk when you left –

MR. KEAN: No.

MS. MUZYCHKA: – that had not been previously discussed with management as a potential risk.

MR. KEAN: So, there was no claim sitting on my desk when I left.

MS. MUZYCHKA: Okay.

MR. KEAN: Any change orders were well – that were there that were either under discussion, they were discussed in the November 16 steering committee meeting in Montreal with Quanta and Valard. All change – open change orders were discussed. And they flagged, at that point in time, there were three to four issues that they wished to have looked at. And we agreed that we would set up a commercial working team with the commercial groups from each division to work on that, and they would come forward with recommendations for closure.

So that's November 16, 2016, the steering committee between Quanta, Valard and Nalcor in Montreal. I was in attendance. And those minutes are in the system and were issued to Valard under covering letter.

The – so all items – open items – we're aware of at that point in time, they had expressed certain

concerns about their foundation selection cost and using the resources of, say, AMEC, who were – who they were using as their in-field expertise. But when I left there was no claim.

MS. MUZYCHKA: No claim.

MR. KEAN: No claim. And I would say to you that what I did – because of that – 'cause I always had a suspicion of potentially a geotechnical claim. I sensed it by the tone. So what we did was look at – I had a team internally set aside to look at that. So Nalcor and the team had a claims avoidance team. We had Long International. Bruce Hallock was there.

And I asked Bruce to step in and – I didn't want to be focused on this day by day – engage Berkeley Research Group out of the US and do a but-for schedule analysis so we can objectively look at this. And that analysis was still under way when I left.

MS. MUZYCHKA: Okay.

MR. KEAN: But I sanctioned it to get it going so an objective decision – maybe I was wrong.

MS. MUZYCHKA: I sense that you didn't feel that the potential claims by Valard had any merit, and you weren't, therefore, allocating any amounts for these.

MR. KEAN: The reason my position on that was fairly – why it was fairly strong was that I felt and what I – how I witnessed the project occurring is that Valard was – things didn't go as planned for Valard initially, okay? So there was delay; however, there were concurrent delays. They had foundation challenges. There was a little bit of access noise; I agree with that. However, they had concurrent delay on guy anchor installation, which was in their own control. They could not install the guy anchors to allow them to erect to the towers. So no matter if they had the foundation in or if the road was there or not, they couldn't install the guy anchor.

So with knowledge of concurrent delay being prevalent, we felt strongly that the – that a rationale for compensable time would be limited. And that was part of the position, again, on waiving – giving time because there was no

need to accelerate the completion of the DC transmission because Alstom – was very unlikely that they would be available.

MS. MUZYCHKA: Okay. Let's have a look at P-03185. That's at tab 72 in book 3.

I believe you had brought that email or letter to our attention in support of your position that Valard's claim was weak. Is that fair?

MR. KEAN: Well, I can't say for certain if Valard's claim was weak because I had never received it – a physical claim document. But my view on the strength of any (inaudible) claim on these issues, I felt was weak, and I received this document after I had left. It was in my mailbox, I believe I told you.

And I was – it was – I don't think any claim had been received at that point in time, but it – I think Mr. Hallock is just pointing out to Mr. MacIsaac and Mr. Fleming that he's been working with Berkeley "... for some time to build an as-built schedule and a scheduling monitoring tool to assess the current progress and project Valard's probable completion dates."

And he'd also been working with BRG on Valard's potential claim issues, and it goes on in the second page. He said: "The development of the as-built schedule started some time ago at Jason Kean's directions." So it just gives more context there of the work that he has under way. And then on page 3, second –

MS. MUZYCHKA: Before you go to page 3, at the bottom –

MR. KEAN: Sorry.

MS. MUZYCHKA: – at the bottom of page 2, they note this – "... second task has been to look at the Valard cost claims. ... current projection from Valard is that they total about \$300 million."

MR. KEAN: Yes.

MS. MUZYCHKA: "So far these claims are little more than numbers on a spreadsheet, with a limited description ..." et cetera. But they're

certainly brought to someone's attention, that they were looking at a claim of – in the –

MR. KEAN: Yeah.

MS. MUZYCHKA: – range of \$300 million.

MR. KEAN: So I have no – you know, the \$300 million or – this was March 20, 2017. I had left January 4. So I don't know where this spreadsheet is or what –

MS. MUZYCHKA: Okay.

MR. KEAN: – and it's just, you know – so I – you know, maybe there – I'm sure there is a spreadsheet that would exist that would support this, that – Mr. Hallock in the statement he's making – is that that didn't exist when I – at my tenure, and nor did I – was I aware of that is the point I'm bringing out here.

And Mr. Hallock does make – you know, go through on page 3 from a perspective of: Is preliminary – you know, he said: "Valard's largest single claim" – in paragraph 2 – "item is delay. Our initial assessment is that Company is not liable for very much, if any of Valard's delays. Much has been said about access, and we can demonstrate pretty clearly Valard's claim is more myth than fact. Valard's own reports show they had access in plenty of time. Up to September of 2015 Valard was responsible for access, so they have little basis for a claim in this period."

MS. MUZYCHKA: Okay, and on that point we talked about earlier, the difference in viewpoint that Valard had with Nalcor as to the responsibility for access and how they felt undermined in their ability to actually manage the contracts and create the roads fit for their purpose because of the direction from Nalcor. So I don't know that that's a fair statement based on what we discussed earlier.

MR. KEAN: And I – well, there – of course there's a lot of dialogue between us on that over time. The part of having Mr. Hallock is an objective in Berkeley – you know, when you get to a point you try to make sure you get as objective a group as possible to look at this, to make sure you can work through the items. And Mr. Hallock had done an assessment; he was

aware of all these things, and he's making a statement here about the viewpoint.

Now I don't know what was received after this memo –

MS. MUZYCHKA: Okay, well –

MR. KEAN: – claims package, but I guess this helps reaffirm the statements I had made about my view.

MS. MUZYCHKA: Okay.

And, again, Mr. Hallock does acknowledge that it's an initial assessment and he's waiting to see what Valard will provide.

MR. KEAN: Sure.

And I did get a copy of that claim. You sent me in my – in one of the exhibits.

MS. MUZYCHKA: Yes.

MR. KEAN: And I'm sure there is a comprehensive analysis of that within Nalcor's records and the recommendation.

MS. MUZYCHKA: And –

MR. KEAN: I wouldn't have been privy to that, I guess.

MS. MUZYCHKA: No.

Were you aware that Valard had been readying themselves for litigation at this point, even while you were still involved? I mean, this is all happening in 2016 – or sorry, 2017. And you were still there as of January 2017, correct?

MR. KEAN: So they're – Valard had made no statement to me about litigation, but any contractor, just like we were, if you have concerns and you see delay you need to look at protecting yourself. So we had engaged Berkeley; we had Bruce Hallock. They were looking – I'm certain they would be looking at – do what they would have.

MS. MUZYCHKA: Okay.

MR. KEAN: You know, and of course the contract had various dispute resolution mechanisms including, you know, management meetings, arbitration, of course (inaudible) good settlement, litigation.

MS. MUZYCHKA: Right.

Six weeks after Hallock's letter, Valard presented a 101-page document outlining their claim. And I didn't include it in the binder but it certainly includes a very detailed review of delay charts outlining all the various aspects of their claim and was a very thorough and detailed document, which I understand you hadn't seen. But certainly it would suggest that there was – it was more than just a few numbers on a spreadsheet that Mr. Hallock had referred to. And I find it difficult to believe that in all of the interaction that you were having with Valard during that time period, you weren't aware of the potential of a significant claim being advanced on their behalf.

MR. KEAN: They never made me aware. I identified the risk of a potential claim and it's been captured and presented to various groups including, as I said, the Oversight Committee in January of 2016. It was a prominent risk within the T-line team, if you look at the T-line register and the various updates I gave to Mr. MacIsaac and the viewpoint at which we saw.

So Valard never – in the period of time that I – came out there and said: We're going to be giving you a claim. There were open issues that they were trying to work through but they never said they had a claims team in the background, nor did I.

MS. MUZYCHKA: No, of course not. And I –

MR. KEAN: I mean, as to the comprehensiveness of the Valard document, I guess Mr. Hallock and the various claims consultants would have looked at that in order to reach a calculated settlement. That would be very well – I mean, you're dealing with big money.

MS. MUZYCHKA: Big money and –

MR. KEAN: So that's gonna be thoroughly evaluated, I would say.

MS. MUZYCHKA: – Valard – Quanta Valard is a big company.

MR. KEAN: They are.

MS. MUZYCHKA: And they weren't going to –

MR. KEAN: (Inaudible.)

MS. MUZYCHKA: – you know, take lying down that they were responsible for the right-of-way delay issues.

MR. KEAN: And they're a good contractor, I would point out.

MS. MUZYCHKA: Yeah.

MR. KEAN: You know, Valard was – did a good job on the – on this, you know. And I've made that quite known to people that – very glad that we had Valard do this work. And they – those folks got a lot to be proud of, as do our people. But I guess from a perspective of the claim, I had no knowledge of that.

Now, in the claim document that's presented, as I said earlier, mind you it would be concurrent delay. There's nothing about guy anchors. So there could be a bit of smoke and mirrors there as well.

MS. MUZYCHKA: Okay.

MR. KEAN: But did – and I do know from those that were deeply involved in this – in the transmission right-of-way, in the foundation construction, in the management, the group that I relied upon as having the expertise, they – individuals in that group have asked – you know, they've said to me, we weren't asked for any input. So how was it evaluated?

MS. MUZYCHKA: All right.

And as I stated earlier, Valard indicated that from the settlement, a significant portion of it related to unit-cost issues as opposed to delay. So –

MR. KEAN: I guess Nalcor's records would show that.

MS. MUZYCHKA: Okay. All right.

Well that's where I'll end on that topic. So maybe now time to break for lunch?

THE COMMISSIONER: Okay. So we'll take our break for lunch and be back at 2 o'clock this afternoon.

CLERK: All rise.

Recess

CLERK: All rise.

This Commission of Inquiry is now in session.

Please be seated.

MS. MUZYCHKA: Good afternoon.

MR. KEAN: Good afternoon to you.

MS. MUZYCHKA: All right, just want to talk briefly with you about the schedule.

I understand it's your position that the cost estimate and the schedule was reasonably achievable at the time of sanction, with first power July 2017 and full power December 1, 2017. Is that correct?

MR. KEAN: I'd said that the schedule was achievable. However, there's – there were identified quite a few stressors that would stretch that schedule should any of these events occur.

MS. MUZYCHKA: Okay, but at the time of sanction, it was thought that –

MR. KEAN: It's attainable, yes –

MS. MUZYCHKA: Attainable.

MR. KEAN: – it's attainable. And the basic premise there, if I could, is that from a planning perspective, a – throughout the evolution of Muskrat Falls or all Gull Island projects – was that you would – a viewpoint of we'd like to – we would – executive would target a date: you know, is it possible to have power in 2016? Is it possible to have power in 2014, 2017? And we would – the engineers, the planners would go away and evaluate and develop a detailed plan to

say: Yes, it is possible if the following does occur, and this is the detailed schedule; however, there are risks associated with it.

In that same vein, a plan was developed to demonstrate that a July 2017 was attainable – 2017 first power.

MS. MUZYCHKA: Right, okay.

But by certainly the first year of the project, in November 2013, once the contract was awarded to Astaldi and almost a winter had gone by without much progress, you had to have known then that the schedule was no longer attainable, surely.

MR. KEAN: Well, we sanctioned – the sanction – project was sanctioned in December. In February of 2013, so, there was a major logic change in the Muskrat Falls Project based upon the early bids of the powerhouse bidders. And what had occurred was the river diversion had shifted from 2015 to 2016, and there were a number of other planning changes that were geared towards addressing some of that early feedback that was coming from the market, from the powerhouse and spillway and contractors.

And, of course, the bids for that package, I believe, was received that spring of 2013, and, of course, they were evaluated. And, you know, what I understand was that the powerhouse contractor presented what was deemed to be a credible proposal to execute and deliver 2017 – or the civil concrete powerhouse and so on to allow power to occur in the end of 2017.

MS. MUZYCHKA: Okay.

Well, I just want to draw your attention to Exhibit P-01962, Madam Clerk. And at – it's also located at tab 70, book 2 – or, sorry, binder 3. This is a letter to Stan Marshall from Paul Harrington dated June 6, 2016. And the subject is entitled Concerns.

So are you familiar with this letter? Have you seen it before?

MR. KEAN: Yes, I am.

MS. MUZYCHKA: Okay. If we look at page 1 – or, sorry, at page 2, second paragraph and

starting at – well, we’ll start with the sentence: “The recently completed QRA resulted in the same result, a P75 of 79 months from Project Sanction to First Power. However the direction that was provided to the Project Team was to set a very aggressive schedule with a First Power target that was recognized as being in the P5 to P10 range. The unlikely probability of achieving these cost and schedule targets was well known.”

Now, is that consistent with your statement that at sanction and even the year subsequent, that you felt that the target – or the schedule was attainable?

MR. KEAN: What I think I’ve said several times was that the schedule that we had built was based upon realistic planning durations that was done by our engineering team based upon the design that existed. We had identified a number of stressors that were key risk that should they occur, they would throw the schedule out one to two years.

What I’ve always said is that whilst it’s – you know, the certainty of whether either of those events will occur – it is likely that other things will occur. I think I – you know, in that regard. So there will be stressors, whether we predict them now or later. So in that regard, that’s why I characterized it as aggressive because from a project team perspective, we didn’t have reserve to accommodate those things. That was with management, I guess, in that regard.

But – so the – while we had a credible schedule, only if things went per plan.

MS. MUZYCHKA: Yes, only if they went per plan. But if you look at the P5 to P10 range, that means you only had a 5 to 10 per cent probability or likelihood of achieving that schedule.

MR. KEAN: That’s based upon that – those risks that were identified. And as you can appreciate, there could be other risks that could make it better or worse, just like we’ve seen today with other aspects of this project.

MS. MUZYCHKA: Okay, but it’s being recognized by Mr. Harrington, who’s the project

director, that this schedule is unlikely at best – 5 to 10.

MR. KEAN: That’s what Mr. Harrington’s stating there, yes.

MS. MUZYCHKA: Yes. And you’re not taking exception with that statement, are you?

MR. KEAN: Not at all.

MS. MUZYCHKA: Okay.

MR. KEAN: Prior to DG3, we – the analysis was done and people were, you know, the decision-makers were well aware of the schedule, the quality of what we had built, but also the risks that it was – that were out there.

MS. MUZYCHKA: Okay.

And I understand that you had seen a version of that letter. It was provided to you in draft form prior to – I’ll direct you to book – binder 2 at tab 41 and it’s Exhibit, Madam Clerk, 03166 please?

Okay, and if you can see that the initial email is dated June 4, 2016 – just scroll down there, thank you – from Mr. Harrington to you where he’s indicated he’s drafted a letter to Stan Marshall he’d like to send on Monday, June 6. And he mentions facts about the sanction QRA, the P75 prediction of 79 months, et cetera: “appreciate your feedback and suggestions to the text.”

And your response is contained there at the top: “Well put.” And – but you don’t mention anything about the P5 to 10 reference to the schedule and cost being aggressive or incorrect or anything like that. Isn’t that correct?

MR. KEAN: No, I’ve said previously, you know, I still characterize it as an aggressive schedule. I think that’s fair to say.

MS. MUZYCHKA: Okay.

MR. KEAN: No doubt about that because, as I said, whether the risks that we’ve identified occur – or some other risk that we may not identify –

MS. MUZYCHKA: Right.

MR. KEAN: – you need to have reserves in some fashion to accommodate that.

MS. MUZYCHKA: But in this particular case, where you say it was attainable, that would suggest that there is some likely probability that that could happen, whereas my point is that, based on what the project director was indicating, in fact, the schedule and costs that had been proposed at the outset was very unlikely and only had a chance of 5 to 10 per cent of being achieved.

MR. KEAN: Well, I don't know about the 5 to 10 per cent. I've talked about that in my Phase 1 – about it being some number which I didn't have a probabilistic curve, but my – I had an earlier indication that I thought was higher, but I still think it was in that 20 to 30. But a lot – if the risk events would occur – it would be a very long tail on the completion of that. That's where the – up to 21 months of delay could occur on a P75 basis.

So, you know, in – as I said, I characterized it as an aggressive base. It was a well-developed schedule. However, you know, it's based upon and aligned with the productivity and plans. If the weather – if we have a bad weather calendar or bad weather season, the Muskrat Falls schedule is very much driven by critic – weather-dependent events. Missing – river – closure periods and so on. So if any of those were to occur we would flip another year.

So yes, in that regard, aggressive.

MS. MUZYCHKA: Okay.

And I think that's inherent in the P-value that's assigned to that – that there was a significant level of risk attached to meeting that –

MR. KEAN: Sure.

MS. MUZYCHKA: – particular deadline. Okay.

I just want you to also have a look at tab 65; it's Exhibit P-03179. It's the draft version of the letter. Or, sorry, 66 is the draft version – tab 66. And I'm not sure – so in this letter – and I don't have the page, unfortunately, but he notes that “the Project team identified the risks to the

Project Schedule but was held to an almost impossible probability of achieving the published First Power date.”

Do you agree with that statement?

MR. KEAN: Well, those are Mr. Harrington's views, I guess. I think it's fair to say that it was recognized and communicated as a low probability of achieving the schedule.

MS. MUZYCHKA: Okay.

MR. KEAN: So in that regard, it would've been a – certainly a challenge for the team. Everything had to go per plan, no fat in your pocket.

MS. MUZYCHKA: No, and I think, you know, he's being even more conservative and he says “almost impossible probability.” So he was far less optimistic than you were that this was attainable.

MR. KEAN: Well he's given a viewpoint there on – I guess from a perspective of attainability. I can only say that the schedule, as we developed it, was a good quality schedule, but it didn't recognize the risk events.

MS. MUZYCHKA: No, okay.

We've also heard evidence that the independent engineer was told in November 2013 that the schedule was very achievable and realistic. Given what we have just discussed and the views of the project director, on what basis could that be the case? Why would that be communicated, especially in November 2013, when at that point, you know, the Astaldi delays were evident and –

MR. KEAN: I don't think – so –

MS. MUZYCHKA: – there's –

MR. KEAN: Sorry.

MS. MUZYCHKA: No – you know, I mean, there was obviously a degree of optimism that's being communicated late November or late in the year.

MR. KEAN: So, from a perspective of the, Commissioner, the schedule, in February of 2012 the project team issued its first integrated project schedule. And that schedule is designed to incorporate all the detailed schedules coming in from contractors.

So it was that same period of time MWH were engaged in the months prior, actually, in late 2012, as the independent engineer. We had given MWH a glimpse into the detailed schedule work forming the basis of the sanction recommendation as well as the risks to the schedule. We – I took them into a deep dive into the quantitative risk assessment that showed there was a number of big risk – three big risks, principally – that were influencing the outcome of the schedule, showing that it was a very low probability. So MWH were aware of that.

In 2013, when we met with MWH again, we had the – in the fall of 2013, I should add, at the time you reference – we had the benefit of having the detailed submissions from Astaldi as part of the proposal as well as the other bidders. And my understanding is that the bid evaluation team felt it was achievable and Astaldi agreed to the schedule. So in that regard it was a validation that, you know, as a schedule it was plausible. However, we still had these risk events out there.

MS. MUZYCHKA: Okay.

Well let's have a look at the presentation that was made to the independent engineer. Madam Clerk, Exhibit number 02233 and that is located at tab 27 in binder 2. Go to page 6.

Could you just go back to the first page – or second page? No third page, the cover of the slide presentation. Thank you.

The – this is the Critical Path Overview Presented to MWH. And that was the independent engineer, correct?

MR. KEAN: That is.

MS. MUZYCHKA: And it's dated November 25, 2013. And the purpose of it, on the second page – it is to "Provide MWH with assurance that the critical path for the LCP is both understood and reasonable."

MR. KEAN: Yes.

MS. MUZYCHKA: Okay.

And you wrote this, didn't you?

MR. KEAN: I was in –

MS. MUZYCHKA: Or –

MR. KEAN: – I was – the detailed work had been done by the planners. I think I helped assemble it into a final product and issue it.

MS. MUZYCHKA: Okay.

MR. KEAN: That's why it's coming from me. But I think the preceding tab, Exhibit 02229, gives some of the background for this document as well.

MS. MUZYCHKA: Okay. And then on page 6 we have Key Messages, and certainly after describing a number of points you say, "There" – is – "considerable overall float in the schedule for both LIL and LTA." And you then note, "The overall LCP schedule is very achievable and realistic." Okay? And do you agree with that statement today? Did you agree with it then, more importantly?

MR. KEAN: I agree with it in the context of – from a deterministic perspective, without the consideration of these – of the risk exposure.

MS. MUZYCHKA: Without consideration of the risk exposure?

MR. KEAN: That's right.

MS. MUZYCHKA: But how are you to determine if a schedule is achievable if it doesn't have the risk factors built into it?

MR. KEAN: How –

MS. MUZYCHKA: I mean, if you're trying to tell the independent engineer, who is reporting to Canada and advising on the progress of the project because they have a substantial amount of money invested, and you're reporting to them that the schedule is achievable and realistic and we're ongoing – because delay costs money, correct?

MR. KEAN: Time does come with the money factor, yes.

MS. MUZYCHKA: Right. So wouldn't it be important to be candid with the independent engineer –

MR. KEAN: Sure.

MS. MUZYCHKA: – and the people to whom they report to and say: The schedule is aggressive. It has a low probability of success, but we will work aggressively to manage the risks as best we can?

MR. KEAN: Of course.

MS. MUZYCHKA: And we are making an allowance for this risk of X number of dollars. Wouldn't that be a more appropriate approach than saying: We can do this. It's achievable and realistic?

MR. KEAN: But that's exactly what was done as part of the DG3 QRA. We had taken – or taken MWH through – is that the risk analysis showed that it was a low probability, and there was cost implications for that. Unfortunately, there was no reserve. And that's not – that wasn't my decision, as you can appreciate. So here we are; we're a year later, we're giving them a recap of where we sit today based upon the new information. I believe the preceding tab gives the direction from Mr. Harrington, Mr. Bennett and so on talking about the basis of this – these assumptions.

The group that were very much involved in this – and I expect, you know, Mr. Harrington in that regard will be able to give more clarity and context. But that Exhibit 02229, under tab 26, does give, you know, Mr. Harrington's viewpoint of – to the basis that the schedule's being put together.

And my understanding of that conversation that occurred with MWH is that despite, you know, anchoring them back to DG3, the QRA, which they had reviewed and commented on and expressed some concerns on the schedule, but the gross schedule of 5½ to seven years they thought was achievable. And now we're at a situation that we've gotten information from Astaldi that looks to be reasonable and that it

should be able to produce a – you know, verify that the schedule should be able to be achieved. However, you know, context around this is what are the risks and uncertainties.

MS. MUZYCHKA: Okay. But I think the point, Mr. Kean, is that at the outset, before the Astaldi issues came up and the potential for delay, you were already in a very unlikely situation of achieving – as Mr. Harrington noted, that it was virtually impossible.

MR. KEAN: So, I'm not going to argue the point that in – I think that was evident in August of 2012, and, you know, we had – actually in July 2012 with the first risk analysis, Commissioner, there – you know, it was evident that there were a lot of risk. The schedule did come with challenges, despite the good work that had been done. So we got some agreement to do some things to help improve that in terms of camp, the access road, early award of bulk excavation, but the subsequent analysis still showed that the probability was on the low end.

MS. MUZYCHKA: Very low end.

MR. KEAN: Well, we've had that discussion about whether it was full or first power, but it was on the lower end and, as you say, very. So in that regard, context-wise, you know, that's why the project team would have liked to have a reserve. We'd have been much happier, even though we had a schedule that support a July of 2017, if someone went out publicly and said it was '18 or '19 power, great. But that's – all we can do is in – keep people apprised, make them aware of what the risk is. We had no control over that.

MS. MUZYCHKA: Okay. But you do have control over the message that you give. And in this case, you gave the message that it was achievable, and now you're qualifying that with: with a reserve. And I would suggest that not qualifying your achievable opinion as to the schedule was misleading to both the IE and to the others who would have depended on that information.

MR. KEAN: But the IE had the qualifications. That's part of risk assessment work we were reviewing with them and the conversations that were occurring. They were aware of that 11- to

21-months' exposure. And we had – you know, as I recall the discussions, which is quite a few years ago, is they were, you know, talking about were these mitigation measures, are they going to be successful, such as the ICS structure. You know, with a late award, what does that mean?

MS. MUZYCHKA: Mm-hmm.

MR. KEAN: But the end of the day, we did not have actual field production from a concreting of the powerhouse to be able to validate the production rates and to see if those risks would materialize.

MS. MUZYCHKA: Okay.

MR. KEAN: So those background risks were still relevant and still under discussion.

MS. MUZYCHKA: And those risks became evident, you know, in 2013.

MR. KEAN: Well, I think if it –

MS. MUZYCHKA: And they were even more so heightened in 2014 when there was the issues with the ICS structure and there was delay or reduction in production on the part of Astaldi, correct? I mean, some of those risks that were, perhaps, identified were beginning to be materialized. Do you agree?

MR. KEAN: Yes, I would say that it was – I mentioned February of 2013.

MS. MUZYCHKA: Okay.

MR. KEAN: So with some plan – and there was a presentation provided by Paul Harrington in July of 2013 to Mr. Martin and the executive going through some of the concerns.

MS. MUZYCHKA: Okay.

Well, you mentioned that the – there was a QRA that was done just before the DG3 estimate.

MR. KEAN: As part of the –

MS. MUZYCHKA: As part of the process.

MR. KEAN: Yes.

MS. MUZYCHKA: Yes.

Why wasn't there another QRA done until 2016? So you had a period from 2012 until 2016, four years, in which there was no quantitative analysis of the risks undertaken.

MR. KEAN: I think, you know, earlier this morning, we looked at a project controls plan.

MS. MUZYCHKA: Yes.

MR. KEAN: I don't know the exhibit now, but there was a figure that we had spent some time talking through the various steps of how we did plan the project and plan the control. At – we had never envisioned doing any further QRAs on the project, and if you read through the project controls plan, it doesn't talk about doing quantitative risk assessments.

It was in – as the project progressed and, of course, the issues were surfacing, as were evident in 2015, we did a – we did have a project controls review done by EY in that 2015 period. They had encouraged – they had done – they reviewed all the project controls elements and the way we were doing our business. That was, I think, the first time EY looked at the project. They did encourage the need to do a further QRA, given some of the things that were – the open risk. They want – they encouraged the translation of those open risk in terms of dollars.

So it became, I guess – it wasn't planned because in order – it's not typically planned, from my experience, to have QRAs post-sanction unless you have, you know, some major issues occurring. And –

MS. MUZYCHKA: Okay.

MR. KEAN: – those were starting to occur at this point.

MS. MUZYCHKA: Well, they were certainly occurring as early as 2013 and 2014. And one of the points that I noted early in our discussion this morning was a statement that was made with respect to risk quantification or management, and it was the comment by Peter Drucker: What cannot be measured cannot be managed.

So how were you measuring the risk? How were you managing the risk if you hadn't measured it through a QRA?

MR. KEAN: Well, you measure the – you manage the risk by the – first of all you identify the risk. Has the risk been identified? Are you – do an active risk identification. You know, is there – have you framed the risk in terms of what is the exposure on the project? And that often done with qualitative measures. So it could be something you're framing as a \$10-million, \$20-million item or greater. Likewise, is there a schedule risk associated with that?

MS. MUZYCHKA: But they're not single items. We're not just talking about one item with Astaldi. There could be a whole host of –

MR. KEAN: Yes.

MS. MUZYCHKA: – different things that would be contributing to the analysis.

MR. KEAN: That's correct. You don't need a quantitative risk assessment to manage risk.

MS. MUZYCHKA: You don't?

MR. KEAN: It's a tool to translate a, you know, a number of risks in terms of the total cumulative cost exposure. We felt fairly strongly that the trending process was identifying the potential exposures. And I think some of the early presentations you can get a sense of the management outlooks of how the information we had was being projected in terms of exposure that the project may be under.

But, you know, as – I wasn't in the role of the project controls manager then, directly responsible for this. So at that point in time things, you know, it became evident, the need to resurface and do another QRA, which came about – started in late 2015 and was concluded in early 2016.

MS. MUZYCHKA: But now that was triggered at the suggestion of EY, correct?

MR. KEAN: Well, it's – it was an outcome of that, yes.

MS. MUZYCHKA: Okay.

MR. KEAN: Yeah.

MS. MUZYCHKA: And you were aware that they were of the opinion that you should have been doing QRAs on a more regular basis in order to measure and manage your risk profile?

MR. KEAN: I do recall that being an observation.

MS. MUZYCHKA: Okay.

Did you carry out any formal risk assessments? Or how were you managing that as you went along in the three years?

MR. KEAN: The – primarily from the perspective of maintaining active – two things, maintaining the project risk registers –

MS. MUZYCHKA: Mm-hmm.

MR. KEAN: – and actions.

So prior to sanction, there was a lot of development of plans, I mentioned. And now post-sanction we're focused on execution: managing against those plans, monitoring their progress and correcting. So, prior to sanction there was a lot of risk identified, a lot of actions assigned to those risks. So we may have identified a risk on labour, like a labour strategy from which a collective agreement and an industrial relations team came about and a labour relations plan. So post-sanction was about implementing those. Are we having, as an example, meetings with the various unions, liaison committee meetings and so on?

So, actions associated with those are being managed; as well, new items were starting to be managed to add to the risk register.

MS. MUZYCHKA: So you were managing as you went along. Is that it?

MR. KEAN: Well that's normally how one would do it. You know, you're – once you execute a plan, you manage against the plan; you make corrections to the plan and you identify new risks as they come about.

MS. MUZYCHKA: Okay.

But there was no formal method undertaken to assess them –

MR. KEAN: Yeah.

MS. MUZYCHKA: – quantitatively?

MR. KEAN: Not quantitatively. They're – on a monthly basis, they're all deterministically assessed as part of the project cost forecasting.

MS. MUZYCHKA: Okay.

MR. KEAN: So that would be a viewpoint of what the exposure would be, best and worst case scenario. And that would've been part of the cost forecasting and management outlooks that were being provided that might say even though we're sanctioned at 6.2 billion in December, by July we're saying, you know, this could be 7 billion.

So that process of assessing, gathering data was occurring in the background by the project controls team.

MS. MUZYCHKA: Okay.

But I think the method in which you described your managing of the risks to EY led them to make a statement, and I'm sure they'll give evidence on that when they appear in the Inquiry shortly, that the style of managing without doing – without updating your QRA since 2012 was akin to managing by the seat of your pants and living with the results because you don't have any means – formal means by which to forecast and to plan for the risks being revised as you went along.

MR. KEAN: So I don't know the basis of EY's comment. They can speak to that themselves. What I do know is that there was a fairly mature risk management process in place. And I think, you know, the – it's evident from the work that had been done and the actions that are assigned to all the risk that various elements of the project went very well because of good risk management.

MS. MUZYCHKA: But if you did a risk management, or a QRA, and it revealed that the cost likelihood for the project had increased, would that have caused any concerns in terms of

your reporting to management? Were you concerned about, for instance, the COREA?

MR. KEAN: Personally I wasn't, no.

MS. MUZYCHKA: No?

MR. KEAN: I wasn't involved in that so I can't really speak. All I know is that there was considerable communication upwards and awareness of the issues that were occurring, the cost exposure that existed, and what's some proposed solutions around those and what – if some of those mitigations were to be successful, what the implication – how cost forecast could be reduced.

Likewise, there was awareness of the issues that could be potentially coming down the pipe. So there was considerable, you know, communication and putting together of slide decks that – and backup to allow that to be communicated upward to, you know, Nalcor's Executive Committee and, you know, VPs and CEOs and –

MS. MUZYCHKA: Okay.

MR. KEAN: – where that went beyond that, I have no idea.

MS. MUZYCHKA: But when you requested new AFEs, Authorization for Expenditure, from the board of directors, you had to request amounts covering expected contingency, right?

MR. KEAN: I – the AFE would include a contingency.

MS. MUZYCHKA: Right, and so my question is: How could those amounts have been chosen without doing further risk quantification?

MR. KEAN: I think most of the contingency that was utilized was based upon a deterministic viewpoint. We need 5, 7 per cent more, 10 per cent more based on upon expenditure to go.

MS. MUZYCHKA: So –

MR. KEAN: And the risk – the viewpoint of the risk exposure would've been captured in the initial cost viewpoint, the expected value method, whereby a risk is identified. Let's say

we have a risk of a – of transmission lines need an extra 100 million. We would look at, from an expected value, do we think that's a 10 per cent chance to occur or 90 per cent? And if it's the 10 per cent, it would be \$10 million added to that forecast; if 90 per cent, might be \$90 million. No probabilistic, but purely just a – an expected-value-type approach.

MS. MUZYCHKA: Okay, but that's not a terribly (inaudible) –

MR. KEAN: It's – it's an –

MS. MUZYCHKA: – sophisticated way of doing it.

MR. KEAN: Well, expected value – not – it's best practice to use probabilistic modelling, yes, for contingency, but –

MS. MUZYCHKA: Especially for a project of this magnitude. You're –

MR. KEAN: – however, expected value using such methods are acceptable, and that was done on a monthly basis. That's the – what forms the basis of all the cost reports.

MS. MUZYCHKA: Okay.

MR. KEAN: In terms of the basis of contingency, I wouldn't be able to comment. I wasn't involved in those future forecasts, you know, contingency. Post-sanction, I – really my role started to shift away – moved very quickly into the transmission world.

MS. MUZYCHKA: Okay, all right.

Just wanna ask you now about the bifurcation of the project, from the perspective of whether, in your view, it was a good decision?

MR. KEAN: I think bifurcation brought extra leadership to the table.

You know, I think – there was a lot occurring in the period up through '14, '15, '16, and I would say that, you know, here we have a project that has some, let's say, risk that might've been identified that we thought were being mitigated are starting to materialize again. Then we have new, unexpected risk materializing, and of

course with each – that you got increased costs. There was another review, an assurance activity, for, you know, for various reasons.

So of course there are a lot of challenges occurring within the project. Leadership, in that regard, Mr. Bennett, (inaudible) just, you know, single point. So having the project-split bifurcation brought extra leadership. I think that was beneficial. I think Mr. Marshall's intentions there were great and, you know, I had no problem with the bifurcation. My – two things: The aspect of why we're doing it, I think, could be explained more so. Secondly, I didn't agree with the management style of the incoming VP. So – and part of that was non – a lack of communication of why we were doing certain things or going to do things differently.

So, bifurcation was good. I think Mr. Marshall's intentions were good. There could have been various ways to actually have executed it, and it's all driven by the people.

MS. MUZYCHKA: And you indicated in a previous interview that you felt that as a result of the change in the management structure, I guess, that you felt undermined in your position. I guess, bifurcation had more of an impact on you personally. Is that correct?

MR. KEAN: I think part of it was that with – under the bifurcation scenario, many of the other managers went with Mr. Bennett, and, you know, I was the – probably the most senior manager that went with the EVP of Power Supply. So, I was – certainly had a lot of working relationship with Mr. MacIsaac in the early phase.

And, you know, I don't know if our chemistry was great. You know, management style, quite different.

MS. MUZYCHKA: Yes.

MR. KEAN: And – so I guess it was fair to say that I didn't appreciate his marginalization of individuals and his ill regard for business processes.

MS. MUZYCHKA: Okay.

And that's the reason you felt you couldn't remain on the project, I guess?

MR. KEAN: Well, I guess in that regard, Mr. Marshall has appointed him to that role. I can't – the project is too important to have factions. It's time for me to move on.

MS. MUZYCHKA: Okay.

MR. KEAN: I moved on.

MS. MUZYCHKA: All right.

I just want to ask you a question about your involvement with CH0009.

If we could pull up P-03259, please. It's at tab 103 in binder 5.

MR. KEAN: What –

THE COMMISSIONER: It's at –

MR. KEAN: Binder 5?

THE COMMISSIONER: – 103. And I think it may be misnumbered.

MS. MUZYCHKA: I think it is.

THE COMMISSIONER: So I'm just trying to figure out which one it would be.

03259 ...

MS. MUZYCHKA: Sorry, it's 103, but it's binder 4. My mistake. It's the correct exhibit number.

THE COMMISSIONER: Binder 4.

MS. MUZYCHKA: Okay, I don't know if you've had a chance to review that email, Mr. Kean.

MR. KEAN: I need a second.

MS. MUZYCHKA: Fairly straightforward. It was received by Mr. Learmonth on May 2 from Leonard Knox. Do you know who Mr. Knox is?

MR. KEAN: I know Mr. Knox, yes.

MS. MUZYCHKA: And who is he?

MR. KEAN: Mr. Knox was, I think, former head of Bird Heavy Civil, which was H. J. O'Connell, I guess.

MS. MUZYCHKA: H. J. O'Connell, okay.

MR. KEAN: Yeah.

MS. MUZYCHKA: And he describes the following. And I'll just read it aloud: "Mr. Learmonth; I have been following the deliberations" – of – "Contract CC009, RCC dams, with interest. I attended the session today and needless to say, the testimony of Mr. Mulcahy was disheartening to say the least, from the perspective of a open and fair tender process. As I told you in my interview with yourself and Ms. O'Brien I did not feel we were engaged with a fair process. The testimonies of Mr. Turpin and Mr. Mulcahy support my concern."

And then he goes on to say: "In my interview I told you that during the Execution of CH 006, Mass Excavation, and while we were still engaged with tendering the Astaldi Contract, CH 007, I was called into the office of a senior Nalcor manager (he made sure we were alone) while I was at the Torbay office on other business. He then indicated to me if I continued with our request for additional compensation for changes to our contract then that would have a negative impact on us, ie in terms of getting other work at site. Based on the awards of all other contracts at that site from that point, including CH 009, I can only conclude he was not joking. In my view, based on the evidence to date, we were clearly competitive with lowest risk for Nalcor for CH 009 and yet we were not selected. The person who made that suggestion to me was Mr. Jason Kean. If you remember I did not name the person during my interview."

So I want you to respond to that. Do you remember the conversation that Mr. Knox describes?

MR. KEAN: So I remember meeting with Mr. Knox at one point in time. It had actually nothing to do with CH0009. Mr. Knox was part of IKC-ONE for bidding – they were constructing the CH0006 with the bulk excavation at Muskrat Falls. So this would've

been probably the winter of 2014. They were a bidder for the switchyards, the civil-works switchyards at, I think, Churchill Falls, Soldiers Pond and Muskrat Falls. No, I –

MS. MUZYCHKA: Doesn't really matter.

MR. KEAN: – not necessarily –

MS. MUZYCHKA: Okay. Continue.

MR. KEAN: Well, it's important because – so Mr. – we – they were trying to – as I recall, there was some discussions regarding their proposal for Soldiers Pond, which they actually were the successful bidder. We talked about what was under go in CH0006. There was a long – I understand there was a number of open disputes and resolutions. So at this point in time, the CH0007 contract had been awarded. CH0009, I have no idea about. So, you know, I asked him, you know, what's his intention regarding Soldiers Pond. Is it going to be more claims again that if we – if you do the excavation work for us there at Soldiers Pond, are we going to get a repeat of what we saw at Muskrat Falls on the bulk excavation? So that was basically the extent of the conversation.

So what I recall is that CH0007 had been awarded at this point. It had to do with the Soldiers Pond switchyard, which they actually were the successful contractor as H. J. O'Connell. They did a good job. It was done on budget. CH0009, I had no involvement in. I may have signed the bid award recommendation; I wasn't involved in the evaluation. So – and I don't – from a timeline perspective, I don't know if the CH0009 was under way at that point in time.

MS. MUZYCHKA: But you're aware of the fact that H. J. O'Connell had submitted a bid for the contract for the North and South Dams?

MR. KEAN: I would – I don't know if they were – if it had been received at this point. I don't know from a timing perspective.

MS. MUZYCHKA: From when you had the –

MR. KEAN: This conversation.

MS. MUZYCHKA: No, and it may not have been. But I think the point that Mr. Knox –

MR. KEAN: Or even on the bid list. I don't know.

MS. MUZYCHKA: Okay. But Mr. Knox expressed concern that – in the conversation with you that there may be some negative implications for his business.

MR. KEAN: Well, I would say to you that Mr. Knox had did – and their team had did such a great job on Soldiers Pond, their credibility – they did – after the Soldiers Pond, they did the two breakwaters at Dowden's Point and Shoal Cove for us. They were – shucks, they were bidding other work in for – the Long Range Mountains, I thought.

MS. MUZYCHKA: Okay.

MR. KEAN: So they had a great rapport. And they actually did the – for ANDRITZ, they did the synchronous condenser buildings.

MS. MUZYCHKA: Okay.

But is the statement that Mr. Knox makes reflecting a conversation that he alleges you and he had – is that a fair statement, in your opinion?

MR. KEAN: I had a conversation with Mr. Knox about the claims that we saw in CH0006 and asking him would we see the same thing on the Soldiers Pond switchyard.

MS. MUZYCHKA: And so is –

MR. KEAN: And I said we didn't want to see extra claims on the Soldiers – we didn't want a contractor on the Soldiers Pond switchyard who would be lobbying us with claims.

MS. MUZYCHKA: But did you tell him it would reflect negatively on them in terms of further work on the project?

MR. KEAN: It would reflect on the award for Soldiers Pond (inaudible) the team's final evaluation, yes.

MS. MUZYCHKA: But Mr. Knox's –

MR. KEAN: I had no involvement in the other work on the project.

MS. MUZYCHKA: But did you make a statement to him that this could have implications for his company in further work?

MR. KEAN: Well, I'm sure he implied that as a result of I saying that on the Soldiers Pond, it would not look favourably, so – he – maybe he interpreted otherwise.

MS. MUZYCHKA: So you're taking issue with his statement?

MR. KEAN: No, I guess the message that – Mr. Knox can interpret it as he – you know, he interpreted what I said. So I'm not taking issue as he interpreted it, I'm only telling you what I said and when it occurred.

MS. MUZYCHKA: So you did say to him it would have negative implications?

MR. KEAN: I can't recall specifically what I said, but I said it was being frowned upon from an award for the Soldiers Pond switchyard.

MS. MUZYCHKA: Well, he makes it clear in terms of getting other work at the site, so I'm thinking that he interpreted your statement as being –

MS. HUTCHINGS: Commissioner, I think this is – the issue has already been canvassed quite extensively and the – the witness has given his evidence. And I think it needs to be moved on from here, he's already said what she needs to know, what the question he's been –

THE COMMISSIONER: I have no problem with your questions. Go ahead, Ms. Muzychka.

MS. MUZYCHKA: Okay, thank you.

I think you're, kind of, skirting around the issue, Mr. Kean, because Mr. Knox makes a specific statement, and you're talking about, you know, whether he had any current bids in progress or was expressing interest in other projects. I think he was pretty clear in his words –

MR. KEAN: Well –

MS. MUZYCHKA: – as to what he believed that you had said. And all I want to know from you is whether or not you had said that to him, or you disagree with the statement.

MR. KEAN: Commissioner, what I recall, I provided context around the discussion with Leonard. I – we were involved in the Soldiers Pond switchyard discussion, we're down to shortlisting bidders. I asked him, you know, how would things go – this, at this yard? And he did explain to me this was an H. J. O'Connell bid, this is not an IKC-ONE bid, which was doing the CH0006. I recall that was good, with no further discussion around it. If Mr. Knox interpreted that, I have no idea. I wasn't involved further in the CH0009 evaluation, so.

MS. MUZYCHKA: Okay. You were involved in the bidding process though, on CH0009. Your name is on them – on the bid documentation.

MR. KEAN: Yes.

MS. MUZYCHKA: And you acknowledge that at the outset?

MR. KEAN: Yes, and I made that statement early about bidder's list and bidder evaluation processes and so on.

MS. MUZYCHKA: So you would –

MR. KEAN: I would be signing those.

MS. MUZYCHKA: – you would have had involvement then in the process in which the bid was made – or the bidding evaluation process for that particular contract.

MR. KEAN: I would not have been involved in the identification of criteria or the weightings, no. I would have just been there to say at the end, is an evaluation process put in place, and –

MS. MUZYCHKA: But you wouldn't have – so you would have had direct contact with those persons who would be making the decisions –

MR. KEAN: No.

MS. MUZYCHKA: – on the bid award.

MR. KEAN: No, I wouldn't have.

MS. MUZYCHKA: You had no contact with them?

MR. KEAN: No. That would have been the project manager for Muskrat Falls, Scott O'Brien, and the current manager Pat Hussey.

MS. MUZYCHKA: So your role was simply – what?

MR. KEAN: Well, normally, from the perspective of – I was often – all – earlier started out with all bids were coming in and I wanted to get an insight as to what they looked like from a cost perspective. Was it lining up with the estimate basis? Is the scope of work consistent with what's in the estimate? Is the pay items consistent with what's in the estimate? I would look at those things.

MS. MUZYCHKA: So, you were aware of who was bidding on the project.

MR. KEAN: Oh, I was aware of who was bidding, yes.

MS. MUZYCHKA: Okay.

MR. KEAN: Yeah.

MS. MUZYCHKA: You knew that H. J. O'Connell had a bid.

MR. KEAN: I – well, yes. Of course.

MS. MUZYCHKA: And you say that you had no role in the ultimate award.

MR. KEAN: No, I did not.

MS. MUZYCHKA: Okay.

MR. KEAN: I may have signed off the ultimate award recommendation, but I wasn't part of the evaluation team.

MS. MUZYCHKA: Okay. But you were certainly – had your hand in the process where the project was awarded for the package.

MR. KEAN: I can't recall specifically, but it would – I probably would have had the – had seen the final evaluation and signed it, along

with the other ten or a dozen – perhaps 15 names that are there.

MS. MUZYCHKA: All right. I want to move to another item. Let's see.

When he was here recently, Nik Argirov had testified that he had not received a copy of Westney's management reserve recommendations. And in your recent interview, we talked about that and as to whether the risk report had been shared with MWH, and you had stated that it had.

So, we had reached out to Nalcor and we were provided with a transmittal sheet confirming that the DG3 project cost risk report, P-00130, had been sent to the data room for which the IE had access.

So, if we can just pull up P-03253, which is located at tab 97, it's at volume – book 4.

MR. KEAN: I guess I recall – and I had prepared a – you asked me and I prepared a note to give my counsel to send along where I could knit together some of your data-room exhibits.

MS. MUZYCHKA: Right. So that confirms that you were correct, the IE was, in fact, given access to that document.

MR. KEAN: Yes. It – for background, I – we met in October of 2012 in Boston, with the IE. And an outcome of that meeting and action was to get them this document, the risk report.

MS. MUZYCHKA: All right.

MR. SIMMONS: Commissioner, if I might just provide some background to that. When we heard from the independent engineer earlier, and there had been some questions about this, we've investigated the data room and provided what we could about the data room. It was only when I was reading Mr. Kean's interview transcript that I discovered his reference to that.

We went back and we discovered that the other document management system, Aconex, had also been used to transfer some documents to the independent engineer. And that's where we found this and then provided it to Commission counsel.

THE COMMISSIONER: Right.

So ultimately, at the end of the day, if my understanding is right, the IE would've had access to the Westney report at the time. Whether or not he looked at it or not, we don't know, but he certainly would've had access to it.

MR. SIMMONS: That's right.

THE COMMISSIONER: All right.

MR. SIMMONS: And the transmittal – the recipient on the transmittal is Mr. Hokenson rather than Mr. Argirov.

THE COMMISSIONER: Okay.

MR. SIMMONS: So it was MWH that had it. Whether Mr. Argirov himself had seen it or not, is another question.

THE COMMISSIONER: Okay.

MR. KEAN: One point, if I may, Commissioner? In communication that came back and forth with the independent engineer, the risk report is referenced quite a bit in the early phase because they had questions, we're giving them responses, so I know –

THE COMMISSIONER: Right.

So was this from – actually from Mr. Argirov or was this from Mr. Hokenson, Mr. Loucks, or –

MR. KEAN: Mr. Loucks.

THE COMMISSIONER: Mr. Loucks, okay.

MS. MUZYCHKA: Okay.

Lastly, Mr. Kean, you were sent a summons from the Inquiry requesting all your text messages from last year, discussing the Inquiry itself. Do you recall that?

MR. KEAN: I received a summons asking for any text messages that were in my possession, on LinkedIn, social networks, iPhone or –

MS. MUZYCHKA: Okay.

And did you provide any documents?

MR. KEAN: I have no text messages. I indicated to my counsel my phone resets every 30 days and I'm not on Facebook. I'm on LinkedIn but I had no messages regarding the Inquiry. Whether someone has sent me a message that, you know – I've used it historically, yes.

MS. MUZYCHKA: Okay.

We have obtained some text messages and – from Mr. Gilbert Bennett and there was a message received from you on April 16, 2018. So this summons was dated – I don't have a date – but you were required to produce to the Commission on or before April 17, 2019.

MR. KEAN: Yeah.

MS. MUZYCHKA: And so this would've been a communication between yourself and Nalcor for which you were asked to produce records. And there was also a text message in March 26 which indicated you had communicated with either Ron Power or Scott O'Brien. So, you know, these would've been within the 30-day period which would've complied with the summons request that you were given.

MS. HUTCHINGS: (Inaudible.)

MS. MUZYCHKA: So my question is: Why weren't these documents or these messages produced?

THE COMMISSIONER: Okay.

Just – can you turn your mic off just for one second, please?

Ms. Hutchings.

MS. HUTCHINGS: Yes, I prepared – first of all, the summons came in in 2019, and then secondly, the document to which counsel is referring to is in fact dated 2018, which is a year prior.

THE COMMISSIONER: All right.

MS. HUTCHINGS: Mr. –

THE COMMISSIONER: I think maybe the distinction to be made here, Ms. Hutchings, is

that there's one that specifically relates to text messages and another one that relates to any communications between Mr. Kean and Nalcor. So the one in 2018 was more general. The one in 2019 was very specific with regards to the request for his text messages.

I see you're going to see somebody ask you to turn off your mic.

MS. HUTCHINGS: And –

THE COMMISSIONER: Anyway, sorry.

But anyway, go ahead and we'll try to work our way through this.

MS. HUTCHINGS: In any event, I think I could be at fault here because when I advised the client – is that we were looking at email correspondence not text messages or anything of that nature. So I probably am the one who is at fault, not Mr. Kean, for the one last year that we received. And we produced everything that – in compliance with that particular request.

THE COMMISSIONER: Okay.

MS. HUTCHINGS: So there's nothing here that we're withholding or anything of that nature.

And in the meantime, the text message that counsel is referring to, we have not seen a copy of that. And it would be nice – if he's going to be questioned on it, it would be nice for him to have a copy of it.

THE COMMISSIONER: All right.

MS. HUTCHINGS: Thank you.

THE COMMISSIONER: Ms. Muzychka.

MS. MUZYCHKA: Yes, the content, for our purposes, wasn't as important as was the fact that there were text communications, certainly within the 30-day period, as between Mr. Scott O'Brien, and the one from Mr. Bennett of course was last year, but nonetheless.

THE COMMISSIONER: Maybe what I can do is – Mr. Kean, how often did you use texts for business?

MR. KEAN: I guess in the period of, let's say, '13, '14, '15, you know, there would've been general texts throughout the organization. More from the perspective: Are you around, are you coming to this meeting – sort of thing, the nature of text messaging. No, let's say, discussions like you would have on email. Unfortunately text is getting more and more prominent. People like to put – make them longer and longer. But, you know, generally speaking it was, you know: Are you coming to this meeting? Or we have a meeting here. Or are you joining us for lunch? Or, you know, just general chatting, if you would.

I'm surprised I ever received a text from Gilbert Bennett.

THE COMMISSIONER: Okay.

MS. MUZYCHKA: You do communicate with people from Nalcor.

MR. KEAN: I –

MS. MUZYCHKA: And you have during the course of this Inquiry, haven't you?

MR. KEAN: Yes, I've communicated – I have social networks there. Of course last year, as you know, I did some work for them related to this material – this, you know, the five-volume set. I've, you know, I've asked and spoke to various people that I've been asking if they're interested in opportunities. What's their intention? The job is closing up, are you interested? In particular, I was working on a transmission bid here recently.

MS. MUZYCHKA: Sure. But you are also talking about things that are happening at the Inquiry and questions that are being asked.

MR. KEAN: Only if the information was in the public domain.

MS. MUZYCHKA: Okay. All right.

At this point I'm going to turn over the questioning to Mr. Collins.

THE COMMISSIONER: All right.

MS. MUZYCHKA: And I'll return later to discuss one other topic.

MR. KEAN: Thank you.

THE COMMISSIONER: Mr. Collins.

MR. COLLINS: Thank you, Commissioner.

Good afternoon, Mr. Kean.

MR. KEAN: Good afternoon to you.

MR. COLLINS: I have a few questions first about the reliability improvements to the transmission line between Muskrat Falls and Soldiers Pond. And you gave evidence in November, I believe, that from your perspective, reliability is a function of two things: mean time between failure and mean time to repair. Have I got that right?

MR. KEAN: Yes.

MR. COLLINS: And I'm going to lead you through some of these points now because I don't think they're going to be very controversial.

As I understand it, the usual measure of mean time between failure is a reliability return period. So, for example, a line will be built to be – to withstand a one in 50-year event or a one in 150-year event.

MR. KEAN: That's correct.

MR. COLLINS: And at a higher level in order to engineer a line to be reliable against a 50-year return period you need to start off by estimating what are the worst weather conditions the line will experience in a 50-year period.

MR. KEAN: You gather weather data and then you take that weather data and you translate that into physical loading that must occur on a structure, be it wind loading, be it ice loading that would occur.

MR. COLLINS: And those loadings are, for example, in – this tower in this site needs to be able to withstand 50 millilitres of glaze ice, or a hundred kilometre an hour winds, or whatever.

MR. KEAN: Yes. And if I may, during the period between DG2 and DG3 there had been a lot of ice modelling and wind modelling done to

basically gather field data from physical test spans, in particular in the Long Range Mountains, and translate that into physical engineering loads that a structure would have to withstand.

MR. COLLINS: We'll come, I think, to the various improvements and changes over the – we'll come to that soon.

But the main weather conditions we're talking about here are: wind; glaze ice, which is what happens when freezing rain hits a transmission line; and rime ice, which happens in some areas where freezing fog hits a transmission line.

MR. KEAN: That's correct.

MR. COLLINS: Is that right?

And once –

MR. KEAN: Or a combination therein.

MR. COLLINS: And you tested a few combinations – and I think it will be useful, Commissioner, to look at how the reliability return criteria evolved over time. And so I'd like to start before DG2 when you were planning to build Gull Island and build a transmission line to Nova Scotia. Do you remember what reliability return period was planned for that line?

MR. KEAN: That was a much larger system, 450-kilovolt system, capacity of 800 – 1,800 megawatt, and that was planned for a one in 500-year return period weather event.

MR. COLLINS: And so at Decision Gate 2, in November 2010, when Muskrat Falls was first announced and the plan was to serve the province's own load, what was the initial return period used for the Labrador-Island Link?

MR. KEAN: It was a scaled-back version of the larger system for a 320 kilovolt, with a return period of only 50 years, which was typical of the – you know, on the higher end of existing systems in the province.

MR. COLLINS: Do you know who made the decision to reduce the return period from 500 years to 50 years?

MR. KEAN: I can't say definitively who, but it would've been Nalcor System Planning, Mr. Bennett would've been involved there, Nalcor transmission group.

MR. COLLINS: Thank you.

And now as I understand things, in a project of this size the engineering continues to evolve up to sanction and even after sanction, and so in order to produce a cost estimate you need to freeze the engineering at a certain point in time and the cost estimate generally reflects the engineering as it stood at a particular point. Is that right?

MR. KEAN: That's correct.

We're usually – we try to – in that 30 to 40 per cent range, and you get the gross engineering and the gross system parameters to allow the estimators to prepare an estimate, and those might be – give you global viewpoint on tonnage and type of structures.

MR. COLLINS: And so when was the engineering frozen for the Muskrat Falls Project?

MR. KEAN: Could you –

MR. COLLINS: When was the engineering frozen for the Muskrat Falls Project?

MR. KEAN: It was frozen in that fall of 2011 –

MR. COLLINS: Oh, so –

MR. KEAN: – to support SNC's initial estimate submission on the 15th of December 2011, and there were some minor updates throughout the winter of 2012 as the system – concurrent with the Manitoba Hydro observations in the PUB report.

MR. COLLINS: So if we start off, if we go to P-00094, which is volume 2, tab 16, and if we go to page 82 of that document. Scroll down a little, Madam Clerk.

This is a table that shows, I believe, Mr. Kean, the changes in key parameters for the Labrador-Island Link between Decision Gate 2 and Decision Gate 3.

MR. KEAN: That's correct.

MR. COLLINS: And it appears that this generally reflects the change from November 2010 to November 2011?

MR. KEAN: Yeah, this generally reflects the intention from a one in 50-year event to a one in 150, but also the improving and – a lot more maturing in design, but not the entire impact of the one in 150.

MR. COLLINS: Mr. Kean, my understanding is that at Decision Gate 3 the reliability period for the line was one in 50.

MR. KEAN: No, not at Decision Gate 3. Decision Gate 3 was a load reliability of one in 150; however, the engineering was not totally in line with that as I recall.

MR. COLLINS: If – can we go to P-00058 which is, I believe, volume 2, tab 15. And could we go to page 50 of this document.

We see – Commissioner, my timeline has been put on pause for a moment. If we scroll down a little we should see Manitoba Hydro International notes that the CSA standards “suggests a greater reliability ... to 1:150-year or 1:500-year return periods” And skip on a little.

No, no, no, sorry. Madam, please go back. Thank you.

“It is MHI's opinion” – that the – “lines proposed for the Lower Churchill Project be classified in a critical importance category due to their operating voltage and role in Nalcor's long term strategic plan ... and be designed to a reliability return period greater than 1:50 years.”

This is from October of 2012 and it seems to show that Manitoba Hydro International was informed that the reliability return period was one in 50 years.

MR. KEAN: I – in the – as memory serves me correct, that in the period leading up to the final estimate submission of July 2012, there were some changes in the design to allow it to get to more – towards a more one in 150, but it wasn't totally incorporated in terms of the cost estimate.

And, you know, as the – it was more towards a one in 50 as Manitoba Hydro indicating and some of the situation existed whereby the design had not caught up with the final engineering loads – the ice and (inaudible) loading.

MR. COLLINS: So I'm gonna go – I'll return to my timeline, now, Mr. Kean.

MR. KEAN: Okay.

MR. COLLINS: We'll put a sticker on this.

So if we go back to P-00094, which is volume 2, tab 16. Again, it indicates here that between Decision Gate 2 and Decision Gate 3, which I understood to be November 2011, the amount of steel in the Labrador-Island Link increased from about 14,000 metric tonnes to 37,000 metric tonnes. Is that right, Mr. Kean?

MR. KEAN: I can't say with certainty that the numbers of 37,000 tonnes there are at November of 2011 or in the early winter thereafter, but it is in that – that's really what formed the basis of the DG3 estimate. That would be correct, so the 6.2 million would be consistent with 37,000 tonnes of steel, yeah.

MR. COLLINS: How does increasing the amount of steel – I understand it's only one of the changes here, but how does that change the cost of the line?

MR. KEAN: Considerably. It's not just the weight of steel that needs to be installed from the amount of material that needs to be procured, but the effort – actual effort. But more importantly, as the environmental loading increased, you know, what happened was that in order to withstand those loads, the structures had to get much larger. And with the larger structures it changed the construction techniques that were often planned to be utilized. So a guy-wire that is used to suspend a structure becomes much larger. So the effort and machinery required to install that guy-wire is changed.

Likewise, the towers themselves, I believe the tangent tower, which is comprised of 85 per cent of the overall towers on the line, was initially planned to be erected using a single lift with one crane, but it became too big and had to be broken in half with two lifts. So it became a

different project, much different construction, it took much longer, more effort, which is reflected in the cost, of course, that we saw with Valard in the Valard bid price.

MR. COLLINS: And if we go to the next page, Madam Clerk, it indicates I believe, that the change is due – and this mostly lines up with what you're saying. I'm sorry, the previous page – a little higher. It indicates that the cause – one of the major causes here is ice loading criteria and physical data collection. So one of the major reasons that the towers have become heavier is not necessarily that the reliability return period has increased, but that you learn more about how bad the weather is.

MR. KEAN: That is true. As I indicated, between Decision Gate 2 and Decision Gate 3 there have been a lot of physical data collection in the mountains, in particular, with regards to – the system was designed to CSA standards, overhead reliability design standards, which is really driven by event, return periods. So it's based upon the actual – you have to collect data that's relevant for your area, weather data, and translate that into actual physical loading. And that's a very complex process and we had firms from Iceland involved that were taking the data and working with Nalcor and then eventually SNC to translate that into design loads that the engineers would use to design the structures for it.

MR. COLLINS: Thank you.

The next development I'd like to review is P-00048, which is in volume 1 at tab 6. This is from January – this is the Manitoba Hydro International review on DG2 and it was released in January 2012, which is shortly after the – most of the engineering was frozen for DG3, for the cost estimate. And at page 13 of this document it says – and it connects with what I read earlier – down the page.

It says: "... Nalcor has selected a 1:50-year reliability return period ... which is inconsistent with the recommended 1:500-year reliability return period outlined in the ... CSA Standard ... for this class of transmission line without an alternate supply. In the case where an alternate supply is available, the 1:150-year reliability

return period is acceptable. In this latter scenario, Nalcor should also give consideration to an even higher reliability return ... in the remote alpine regions.”

Do you recall how Nalcor responded to this criticism?

MR. KEAN: I recall – of course there’s a lot of various communications here. But I know that their – our transmission team did provide a viewpoint of what the incremental cost would be to go to one in 150 or one in 500. They had estimated in that winter of 2012 it could be an extra \$150 to \$200 million. That was just a notional amount – very preliminary without having done any analysis.

MR. COLLINS: That’s right. And was there a decision to move to the higher reliability period?

MR. KEAN: As DG3 progressed the intention, yes, was to move to that higher reliability period. And I believe it was officially adopted but, of course, the cost estimate didn’t reflect that because the design didn’t reflect that. Because the design had been frozen, you know, by Christmas of 2011 and had gone through that process of final checks in the winter. So there was no further engineering input to give final new design loading to change the – to give new designs and new weights and new pricing to support a one in 150, or one in 500. So in turn what occurred was that while the good intentions and statements were that from a design perspective we’re going to have a one in 150, the DG3 price estimate didn’t reflect that, and it was a disconnect internally, I would say.

MR. COLLINS: And I will notice that – observe that Manitoba Hydro International’s primary recommendation there was a 500-year return period, and it seems that was never adopted.

MR. KEAN: I understand that I – as time when by, the system – there were areas of the system that are designed for a 500-year event. I’ve been informed – that’s not my speciality, but that’s what I’d been informed.

MR. COLLINS: We’ll review that, certainly.

If we could go next to P-03175. As I understand, the engineering and the reliability demands were increasing in an incremental way throughout 2012 and into 2013.

THE COMMISSIONER: Tab 61.

MR. KEAN: Thank you.

MR. COLLINS: Yes, apologies, volume 3, tab 61.

This is an email between Paul Harrington and Kyle Tucker discussing a presentation on the reliability loads for the Labrador-Island Link. And if we go to page 10 of this document we’ll see that as the engineering stood at this time in October 2012, much of the line – all of the line is now meeting a 150-year standard for ice loading, but only 64 per cent of it by length is meeting the standard – the 150-year standard for wind loading.

MR. KEAN: Hmm.

MR. COLLINS: So we’ve moved partly up to 150-year reliability standard, but not all the way. Is that about right, Mr. Kean?

MR. KEAN: Yes, there was a lot of design progression, you might say. I lot of tinkering, if you would.

MR. COLLINS: Yeah.

MR. KEAN: Kyle was a – Kyle Tucker is the – was the project manager for the transmission system, long-term transmission engineer with Hydro, who had a lot of deep knowledge in this and was working through this maturing of the design.

MR. COLLINS: So – and around the same time the DG3 MHI report comes out, which we’ve already discussed.

Although a preliminary cost estimate had been done for this work, do you know if any sort of detailed cost estimate was done during this time?

MR. KEAN: No, there was no detailed update during this period that I recollect.

MR. COLLINS: And did the reliability improvements continue to – the tinkering?

MR. KEAN: There was a lot of – as further knowledge was garnered on the ice loading, further field data from these test spans and test towers – that was reflected in terms of the loading that the tower manufacturer and foundation designer would – were considering. And that occurred through, you know '13, '14.

MR. COLLINS: And I understand these changes – sometimes you're changing the type of tower in a location, sometimes you change the position, sometimes you ask for stronger foundations –

MR. KEAN: That's right.

MR. COLLINS: – sometimes it's rerouted, sometimes you need more towers or fewer.

MR. KEAN: We often say the utilization of a tower, you may design a tower for a certain factor of safety but you may wish to shorten the spans between structures to increase and give a bit more comfort.

MR. COLLINS: So –

MR. KEAN: A lot of alignment – realignment of the line, particularly in the mountains, looking to have – and also here on the Avalon – looking at the ideal (inaudible) – ideal layout in that two-kilometre corridor that we had. With the intent – sorry – to get as beefy a system as possible to be able to respond to the requests for a larger reliability, but trying to do it as cost effectively as practical.

MR. COLLINS: When did the towers reach their final design?

MR. KEAN: I think it was in – well into '15.

MR. COLLINS: Well into 2015. And the Valard contract was signed in August 2014?

MR. KEAN: Yes.

MR. COLLINS: When did you first get your – get a sense of what this was gonna cost?

MR. KEAN: Well, when we did the negotiations with Valard some of the cost was becoming evident because the basic tower parameters existed, the basic designs, but the final towers may not – all of them built. The foundations, as a result of the tower reactionary load, to be able to distribute that load into the earth, the new – the foundations and design were getting bigger. So, you know, Valard advised that that would change or alter the construction methodology. That it would be different than what we saw on the AC, as an example. You might plan for a certain size of rock anchor and it might have to get much bigger, because of the DC – the reactionary loads from the structure to withstand, you know, the wind or ice.

So you were seeing that throughout 2015. And I guess the Valard contract included provisions such that the final tower weights and the final foundation weights would be a true up at the end, such that for every incremental kilogram of tower steel that they installed, it was an extra \$6 per kilo, I think.

MR. COLLINS: Do you know how many tons of steel ended up in the Labrador-Island Link?

MR. KEAN: I –

MR. COLLINS: (Inaudible.)

MR. KEAN: I don't have the final records because the final true up was under way when I left there, but it was in my – I – my guess is it's in the 50,000-ton range.

MR. COLLINS: So from 37,000 at – in DG – the DG3 cost estimate.

MR. KEAN: Yeah, so 14,000 at DG2 to closer to 50 at – installed.

MR. COLLINS: And are the costs associated with increased reliability, are they found in the Valard contract alone, or are they also found in the tower procurement contracts and the foundation – procurement –

MR. KEAN: They're –

MR. COLLINS: – contracts?

MR. KEAN: They're found in the – principally in the foundation contracts, the tower contracts, some of the hardware that is used to clamp the conductor, the guy-wire, the anchor bar. So it's all – pretty much all of the material contracts, it spreads throughout, except things like insulators or a conductor, because –

MR. COLLINS: And –

MR. KEAN: – that was chosen.

MR. COLLINS: And I understand it would take quite a detailed analysis to figure out what the total cost of this was, but do you have sort of a ballpark sense of what this would cost?

MR. KEAN: When you asked me in the discovery, I said about – of the \$900 million, I thought it was probably one-third.

MR. COLLINS: And the \$900 million is the \$900-million cost increase on the transmission assets in general.

MR. KEAN: Yes. That's correct.

MR. COLLINS: So, Commissioner, I'm gonna refer you at this point to volume 3, tab 75, and the exhibit number is P-03188.

And this is Nalcor's request – response to a question from Grant Thornton. And it's quite a long document and I'm not gonna go through it in detail. But it does indicate that the final design of the LIL meets or exceeds the 150-year reliability return periods in all of its weather zones, and that in many sections it does meet or exceed a 500-year reliability return period.

And, Mr. Kean, a question I have about this, if you're able to answer it, is that as I understand it, a transmission line is like a chain and it is only – it's only as strong as any of its links. If any link is broken the whole chain doesn't work. And would you be able to give us a sense of what the cumulative reliability of the entire Labrador-Island Link is?

MR. KEAN: No, I would not be able to do that because that would be someone with specialty knowledge in that area. I would look to Nalcor transmission groups, System Planning in that regard, but it would be a – reliability is that

measure of mean time between failure and mean time to repair. So it has to give consideration to those things and – or a sophisticated modelling to allow that to be analyzed appropriately.

MR. COLLINS: So now that we've talked about mean time between failure, we can move to mean time to repair. What are the major factors in the repair time?

MR. KEAN: Well, I think it's important to recognize that the transmission line is designed to fail. Every twentieth structure is an anti-cascading. So an icing event could occur and would take down 20 structures, but it would stop. It's like playing dominos. It's the stop at – it's the dead ends, we'd call.

So, you know, Nalcor has designed a system with that anti-cascading logic. And for the smart people to have to come up with that – you know, that's all designed in. But, you know, the other part of the reliability equation is always the mean time to repair. So they recognize the transmission could fail so they need to have spare materials. They need to have competent people to do repair. They need to have the right equipment to undertake the repair and perhaps. You know, just as importantly, perhaps one of the more important elements they need to be able to get to the location to enact the repair. So that means you either need to get there by helicopter or some mechanism or have a heavy-lift helicopter. You need to be able to get there with a vehicle or, you know, by a vehicle of some sort.

MR. COLLINS: So –

MR. KEAN: So access plays into that aspect of improved, better quality of access. You know, the more accessible the line is to enact emergency repairs which would increase the reliability of the system. So any planned investments in that access would, of course, translate in some correlation to improved reliability.

MR. COLLINS: Now, my understanding is at Decision Gate 3 Nalcor was planning significantly less access than they eventually built.

MR. KEAN: Yes. There was no plan for permanent access. It was construction access only. Nalcor identified that for this line they would operate it consistent with their other existing transmission access by, let's say, access trails, ATVs and the like.

MR. COLLINS: (Inaudible.)

MR. KEAN: My argument always has been this is unlike the other lines because of the importance and criticality of the line.

MR. COLLINS: So you felt they should've been planning for permanent access from the beginning?

MR. KEAN: Well, we had conversations but at the end of the day I'm not – I was not an expert in that field. You have to leave it to the experts that are going to operate the system to make those decisions.

MR. COLLINS: And I understand in many sections of the line, Nalcor was originally planning the access by helicopter only.

MR. KEAN: Yes, from a construction perspective, the SNC planners and construction managers had designed a – and planned that the line would be constructed using a combination of some all-season road or non-winter access – we might say – dirt road, a lot of winter zones and some helicopter. So – and that was – principally in the interior of Labrador, would be a combination of helicopter and winter because of the large number of big river crossings, the Long Range Mountains, likewise, the Northern Peninsula, certain northern sections there and the Terra Nova area.

MR. COLLINS: And Nalcor ended up building a lot more access than that. Is that –?

MR. KEAN: Yeah, except for 93 structures on the Northern Peninsula of Newfoundland, you can drive and access every structure today by pickup. And I believe, you know, in Labrador, well, there's a few locations coming out of Muskrat Falls close to the highway the structures are – the road is not in great condition, but everything else is a rock road through the interior of Labrador. So fully accessible if it's – the snow is removed from it.

MR. COLLINS: And –

MR. KEAN: And it's a road that's withstand – it's built to withstand, you know, multiple years.

MR. COLLINS: And –

MR. KEAN: It's not a dirt road that's going to wash out.

MR. COLLINS: Why was all this additional access built?

MR. KEAN: One was to enable Valard. We had to get the line constructed. The – first and foremost. So when we looked at the overall – the current design and the creeping weights and the size of the structures, helicopter construction didn't seem to be very viable for the larger structures particularly in Labrador where the electrode line is on the structure. That's not the case in Newfoundland. There's no electrode line on the structure.

Likewise in the mountains, Long Range Mountains, it was deemed to be too risky from a – given the limitations on helicopters and the size of it, it was deemed to be not productive. And everything was getting to be so large it became really not real practical to do for a (inaudible). So it was deemed to be something that you needed to have an access. And, of course, when access construction started, the quality of the original material, the dirt available to make roads weren't great, so it ended up being a lot more rock quarries, a lot more blasting, a lot more rock-fill road and it's much more expensive of course.

MR. COLLINS: And so one of the things we see here is if the towers had stayed as small as estimated at Decision Gate 2, that would – that might've meant cheaper towers but also many fewer roads, you could've had a – there was a cascading effect of increasing tower size.

MR. KEAN: There is definitely a cascading effect. You know, it would've been a game changer from the difficulty and the challenges and the sizing of equipment used. And it quite simply – a simple thing like a bridge, well a bridge is designed to withstand a travelling load. If you're bringing a big pile driver or a big heavy crane it's a much bigger load to take than

a typical – you know, you might be doing more work with rough-terrain equipment where you might – you know, it's much, much more easier.

MR. COLLINS: So these access improvements, I understand their primary purpose was for construction. Will they have any benefits for reliability?

MR. KEAN: Oh, I think definitely. And I think people have been often concerned about what happens if a tower goes down in the Long Range Mountains. And I think – as I indicated, to give you an idea, it's a fully rock road and you can drive a tractor-trailer with an excavator on it through the mountains. So that should give people a lot of comfort from an actual – being able to enact emergency repairs. Likewise, areas that are winter only, that were conceived as winter only, these areas can be accessed, you know, eastern Newfoundland, you know, in particular. So if you look at – across Newfoundland and Labrador, almost all the access built is built out of blast rock. Well, blast rock stands up to time.

MR. COLLINS: In order for these benefits to be realized, the roads will need to be maintained.

MR. KEAN: There need to be some minimal maintenance on the road, yes.

MR. COLLINS: And –

MR. KEAN: Culvert management, water management and some general grading.

MR. COLLINS: And if we go to P-00058, which is, again, the Manitoba Hydro DG3 report. And volume 2, tab 15. If we can go back to page 51.

Manitoba Hydro International recommends an emergency response plan, which could include material caches and spare all-terrain equipment, an access trail system, and it says: "Nalcor acknowledges that an emergency response plan is necessary and will undertake the development of one prior to in-service."

Do you know how far work on an emergency response plan had progressed by the time you left the project?

MR. KEAN: I – at the time I had left, there was no work had been done on it. I understood from – that there's been work started since.

MR. COLLINS: Okay.

MR. KEAN: I don't – I can't – I wouldn't be able to comment.

MR. COLLINS: So, Mr. Kean, my next area of questioning is focused on the DG3 estimate and the QRA. And as I understand it – and this is just some general background – SNC-Lavalin International submitted to Nalcor on December 15, 2011, their estimate which covered the Muskrat Falls generating station, the Labrador Transmission Assets, the Labrador-Island Link, except for the SOBI crossing, and an estimate of their EPCM costs. Is that right?

MR. KEAN: That sounds correct, yes.

MR. COLLINS: Do you know if that estimate included money for transition to operations?

MR. KEAN: No. SNC weren't responsible for estimating that. That was –

MR. COLLINS: Oh, so – yes, apologies. But did the final DG3 estimate include money?

MR. KEAN: It included a – primarily from a staffing perspective, there were a number of people identified, personnel and some basic, you know, offices and so on, but no operational – purchase of operational equipment or anything like that. It was probably a dozen to 15 people identified.

MR. COLLINS: So there was nothing comparable to what MHI was recommending at that time.

MR. KEAN: No. Most of these items, if you were to buy equipment and so on, was part of the capitalized – you know, capitalized operations, I guess, that they are presently involved in as I understand it. But no, not in the DG3 estimate.

MR. COLLINS: Now, I understand that Nalcor rejected SNC's estimate of EPCM hours and replaced the estimate with their own estimate?

MR. KEAN: No, that's not entirely correct. The DG3 estimate for EPCM hours is the estimate that SNC (inaudible) in their proposal at 2.5, 2.6 million hours – person-hours. That's the estimate that was carried forward through to DG3. The December submission included a much higher number of person-hours that Nalcor didn't believe was prudent.

MR. COLLINS: And the net effect – oh, first. The rest of the estimate, apart from the EPCM estimate – the rest of SNC's estimate, was reviewed to some extent under your supervision. Is that right? Was reviewed to some extent under your supervision?

MR. KEAN: It was reviewed in the – we kicked off an estimate review and validation process –

MR. COLLINS: Yeah.

MR. KEAN: – that's described in the base of estimate from January through to, you know, May period. Yes.

MR. COLLINS: And this was covered in November –

MR. KEAN: Yes.

MR. COLLINS: – but you made various changes which are logged in P-00869 and P-00870. They aren't in the binders. But those are two HCSS printout sheets.

MR. KEAN: Yes.

MR. COLLINS: And the net effect of the changes in those two sheets is to reduce the estimate by about \$260 million?

MR. KEAN: Those – in those sheets, yes. I don't know – but there are other – I think some of those costs were items that were doubled because they're in the Nalcor – part that Nalcor is putting together, as an example. But there is an increment – there is – those sheets would have some good details on that, yes.

MR. COLLINS: They do and they indicate there's about \$135 million of changes, which you directed yourself.

MR. KEAN: Yeah.

MR. COLLINS: And I – so my first substantive question on this is I understood from your testimony on November 8 that that \$260 million net reduction included the reduction associated with EPCM costs.

MR. KEAN: I did – I do believe so.

MR. COLLINS: Do you still believe that?

MR. KEAN: Well, I'd have to see the – I can't recall specifically.

MR. COLLINS: So –

MR. KEAN: It would be related to the tab – the two spreadsheets you mentioned that –

MR. COLLINS: Yes.

MR. KEAN: – give the cumulative amount. Okay.

MR. COLLINS: So you believe that does include the EPCM hours?

MR. KEAN: I'm just going from memory. I think it does.

MR. COLLINS: Okay, if we could bring up P-00869.

The EPCM hours Nalcor eventually included here is about \$400 million?

MR. KEAN: That's correct.

MR. COLLINS: And the – SNC's original estimate of the EPCM hours was about \$676 million?

MR. KEAN: In this December submission, but their –

MR. COLLINS: (Inaudible.)

MR. KEAN: – original before that was \$400 million.

MR. COLLINS: Right, but their December submission was 600 –

MR. KEAN: Yeah, okay.

MR. COLLINS: – so –

MR. KEAN: Yeah.

MR. COLLINS: – if you had reduced – if these sheets include a reduction of \$676 million and an addition of \$400 million, then they're included. We can look later to see if we can find one.

MR. KEAN: Sure.

MR. COLLINS: But let's assume for the moment that we can't find a change of that type on these sheets.

MR. KEAN: What I do know is that the documentation that you have in all these binders includes all of the details and all the adjustments.

MR. COLLINS: So if we can't find that on these sheets, it doesn't exist? Then – because my understanding is that there's a 400 – sorry, a 260 – a \$270-odd million reduction in EPCM costs. And in addition to that, there's also the \$250-million net reduction on these sheets. Those are two separate things.

MR. KEAN: Okay.

MR. COLLINS: You don't – would you agree that if we can't find the EPCM change on these sheets, then that's true?

MR. KEAN: I would think so but, you know, I –

MR. COLLINS: When –

MR. KEAN: – sorry, I guess to get back to your – there was a – from – there is a reduction of the EPCM hours.

MR. COLLINS: That's right.

MR. KEAN: Which translated in certain costs. I don't know – exactly know for certain how much that is, but if you're saying it's \$200 million from your interpretation of this, I guess that –

MR. COLLINS: That's –

MR. KEAN: – would be appropriate.

MR. COLLINS: Can we go to P-03198, which is volume 4, tab 85. We'll have to do this more slowly.

Do you – are you familiar with this document, Mr. Kean?

MR. KEAN: Yes, I am.

MR. COLLINS: And I'm on page 2 of this document.

MR. KEAN: Yes.

MR. COLLINS: You see –

MR. KEAN: Yeah.

MR. COLLINS: Is this Nalcor's – is this the estimate?

MR. KEAN: That's the DG3 estimate for EPCM service.

MR. COLLINS: And it's \$403 million.

MR. KEAN: That's correct. Including the amount that was incurred up to that – at the time this document was produced – of \$45 million.

MR. COLLINS: And if we go to P-00860, which I believe is not in the binder. This is a – on page 2. Are you familiar with this document, Mr. Kean?

MR. KEAN: I recall us looking at this document, yes.

MR. COLLINS: And this is a printout with handwriting by J. D. Tremblay.

MR. KEAN: Yes.

MR. COLLINS: It indicates, I believe, if you look, that EPCM salaries are about \$579 million.

MR. KEAN: Yes.

MR. COLLINS: And EPCM expenses are about \$69 million.

MR. KEAN: Yes.

MR. COLLINS: Is this SNC's December estimate of their EPCM hours?

MR. KEAN: It looks – I do believe so, yes. It's shown on the upper left-hand corner 12th of – 15th of December 2011.

MR. COLLINS: And if you add \$578 million and \$69 million you get \$647 million.

MR. KEAN: Yes.

MR. COLLINS: And so when you reduced SNC's estimate from \$647 million to \$403 million that was a reduction of \$244 million.

MR. KEAN: That was within the correct numbers, yes.

MR. COLLINS: Okay. Now, at the break, if you – I'll –

MR. KEAN: No, I don't debate those numbers.

MR. COLLINS: Overnight, I would encourage you to look at P-00869 and P-00870 and see if you can find – see if you can find that change on them. And I'd like to hear from you tomorrow about whether you could find – whether that is included on those sheets. You testified in November that it is, and I believe it isn't.

MR. KEAN: No, I – okay. I think what I recollect was that at the end of the day Nalcor was preparing the estimate for the EPCM services based upon the proposal SNC gave –

MR. COLLINS: That's right.

MR. KEAN: – which is this \$403 million.

MR. COLLINS: Yeah.

MR. KEAN: So while SNC was preparing the estimate for a lot of other items –

MR. COLLINS: Mm-hmm.

MR. KEAN: – that related and came up with this 4.464.

MR. COLLINS: Mm-hmm.

MR. KEAN: So, basically, what occurred was the – SNC's estimate was put to one side and replaced with what Nalcor had produced.

MR. COLLINS: I understand this, Mr. Kean.

Can we go to P-00858, which is volume 1, tab 11. This is a presentation which was given in April of 2012 on the shift from SNC's estimate of its EPCM cost to Nalcor's estimate. And it says on page 2 –

MR. KEAN: Yeah.

MR. COLLINS: – just what you were saying, that SNC estimated in December 5.5-million hours. Is that – and that's correct?

MR. KEAN: Yes, because the award of the contract, you know, some – you know, some, what is it, nine months before was based upon 2.5, which was SNC's proposal. It's the same scope, the same work, but now we've got 5.5 all of a sudden.

MR. COLLINS: And if we go to P-03198, volume 4, tab 85, we were just there, page 2, we see –

MR. KEAN: Yeah.

MR. COLLINS: – 2.6-million hours. This is Nalcor's – this is what Nalcor based the estimate on.

MR. KEAN: That's correct.

MR. COLLINS: So they've cut – so Nalcor cut 2.9-million hours.

MR. KEAN: There was a reduction of two point – there's an alignment of the – the DG3 estimate with the SNC proposal which was detailed out, which is that incremental amount, yes.

MR. COLLINS: If you cut 2.9-million hours out, what were those hours gonna be spent doing?

MR. KEAN: Oh, most definitely. So this came about from a perspective of the role of the EPCM consultant in –

MR. COLLINS: Yeah.

MR. KEAN: – from a construction management, and the role of the contractor. With the changing of new leadership from SNC-Lavalin, Mr. Normand Béchard and some of his views, I guess, that came about which were different than the views that SNC had promoted in its proposal, in terms of the role of the contractor – or the EPCM on the site versus that of the contractor. Normand wished to have a larger team, a larger team in terms of doing more of the QC checks for the contractor, as I recall.

MR. COLLINS: (Inaudible.)

MR. KEAN: Which translated into more inspectors. I think one chap said he wanted – from SNC they wanted 700 inspectors.

MR. COLLINS: They were gonna do some of the quality work for the contractors.

MR. KEAN: That's correct, yes.

MR. COLLINS: They were gonna take on other things that –

MR. KEAN: That wasn't –

MR. COLLINS: – in Nalcor's mind belong inside the contractors' scope.

MR. KEAN: That's right. And wasn't in the scope that was proposed by SNC nor in the EPCM agreement. So you already – you can't – it was planned to have those – those roles and responsibilities are in the contractors' scope.

MR. COLLINS: Is it possible that when SNC estimated the indirects for the contractors, that they assumed that some of those quality control inspection services would be provided by the EPCM?

MR. KEAN: It is possible. However, when we did the review of the estimate, we went through and did a check against that to look at the contractors' indirects. That was part of the validation process in that January through April.

MR. COLLINS: And you were satisfied that they weren't too high – weren't too low? Sorry.

MR. KEAN: Well, I guess the actual indirects are probably – could be something much different today, but from a perspective of that the review was done and that wasn't deemed to be it. It was deemed not to be the same – you know, the indirects were sufficient with the historical estimating norms.

MR. COLLINS: Could we go back to P-00858 for a moment, which is again volume 1, tab 11?

At page 4 of that document we see: "... Unacceptable expectations for EPCM resource requirements; The Project will not pass through DG3."

Was that – was there a connection between excessive cost and the possibility that the project would not pass through DG3?

MR. KEAN: I don't – well, generally it would, you know, from the perspective of this isn't an area where there's a lot of growth, we need to be able to understand what it is. I think this is Mr. Power's presentation, so he would be best to answer that question.

MR. COLLINS: A few weeks ago we had Mr. Paul Lemay here, SNC's chief estimator, and he described his role in putting together the estimate and I'd like to ask you – and particularly surrounding labour productivity –

THE COMMISSIONER: Okay, before we do that, I just noticed it's well past our break time.

MR. COLLINS: Oh, yes.

THE COMMISSIONER: So I'm going to just take 10 minutes for a break and then –

MR. COLLINS: Certainly.

THE COMMISSIONER: – we'll get back and we'll deal with that.

MR. COLLINS: Thank you.

CLERK: All rise.

Recess

CLERK: All rise.

Please be seated.

THE COMMISSIONER: All right. We've got a few people who aren't yet back.

All right, go ahead, Mr. Collins.

MR. COLLINS: Before we address the labour productivity issue, I have a few questions about the way in which the SNC estimate was put together.

First, Mr. Lemay testified to us that he added \$300 million in allowances to the SNC estimate. A \$200-million allowance to reflect low labour productivity and a \$100-million allowance to reflect geotechnical risk. Do you have any information to offer us about whether the estimate included those allowances?

MR. KEAN: As I indicated in my discovery, I have no awareness of those. It's big numbers so I would expect that I would be aware. There – unless – my only – the only thing I can say, unless they were backed into some adjusted productivity measure that would make it, you know, difficult for anyone to interpret. I – they're not something I'm aware of, Commissioner.

MR. COLLINS: Thank you.

Did Nalcor make any significant changes to SNC's productivity assumptions?

MR. KEAN: No. Productivity assumptions were based upon what Paul and colleagues had – their own viewpoint. That's – that was their – based upon SNC's view of how the powerhouse and all the project would be constructed. So that's not an area. You know, there would've been discussions with the counterparts, like John Mulcahy, you know, to talk about those things.

But no, that was their decision. My main concern was that it aligned with the collective agreement. And they were, you know, based upon benchmarked, actual data and reflected, you know, something that was achievable for the physical layout and the characteristics of the Muskrat Falls plant.

MR. COLLINS: And could we bring up P-02645, which is volume 1, tab 4.

Have you seen this sheet before Mr. Kean?

MR. KEAN: I saw it when you gave it to me as part of the discovery exhibit.

MR. COLLINS: But you didn't have access to this sort of –

MR. KEAN: No.

MR. COLLINS: – benchmarking –?

MR. KEAN: This is something an estimator would keep very close to his chest. This is, you know, this is – has build data from Hydro-Québec projects. So, you know, it's something that we would look to have an experienced estimator like Paul to have but – because he's (inaudible) involved, but not something that would be openly shared.

MR. COLLINS: So if we go next to P-00094, which is volume 2, tab 21. If we go to page 69.

At the bottom of the page there's a table showing craft-labour norms used in the intake and powerhouse. And we heard from Mr. Lemay that these norms are – that these numbers are not the numbers he used in his estimate. Do you have any explanation as to why that would be?

MR. KEAN: No. The only thing I recollect is I assembled the basis of estimate using – I put together the basic structure and put a lot of words around the input that was coming in from various people. I asked for the summary of the rates and this is what was given to me, probably by Mark Turpin at that point in time. But at the end of the day, Paul would be – Paul would know more than anyone what's in the estimate from the productivity rates. So I – this could be erroneous in Table 14-12. If Paul says it's erroneous, it must be erroneous, I would say.

MR. COLLINS: Very good.

So when Mr. Lemay was here in March we heard from him about various factors that can affect labour productivity, and about some of the complexities involved in estimating labour productivity. And about how productivity, from one project to another, can be quite different.

MR. KEAN: Right.

MR. COLLINS: And so my next questions are about how Nalcor accounted for the uncertainty intrinsic in estimating labour productivity. And my understanding is that Nalcor treated labour productivity as both a strategic risk and as a tactical risk.

MR. KEAN: That's correct.

MR. COLLINS: And if we go – start with the strategic risk. If we go to P-00130, which is volume 2, tab 16.

THE COMMISSIONER: It will be on the screen.

MR. COLLINS: And if we go to page 294.

This sheet describes strategic risks surrounding labour productivity and it says: "... The Long Harbour and western Province projects are experiencing poor productivity and some jurisdictional problems." And it describes a potential impact of additional work hours, ranging from zero to \$350 million of exposure.

Do those represent – do those figures represent the best-case and the worst-case scenario that will be filtered into a Monte Carlo simulation?

MR. KEAN: Well to – I guess, as I understand it, we took Westney's guidance here on the strategic risk frame – sizing. But it would basically be driven by – labour cost had been \$100 an hour, all in, when you consider the cost to keep the person in camp and so on. So that's generally a good number there for the site.

So this would be – if we had 10-million person-hours for the Muskrat Falls powerhouse, the best case in looking at this risk is it could go as planned or we could have – need an extra, you know, 3.5-million hours, which is 350 million divided by \$100 an hour, so 35 or – per cent more. And how this would – you know, in the – what this would – this and the other strategic risk in Westney's modelling, they would make an assessment of what they thought the probability would be and pick an appropriate probabilistic distribution to model the uncertainty. And that would turn out with an expected – or a P50, P75 values then, accordingly.

MR. COLLINS: So there are a few points there.

MR. KEAN: Hmm.

MR. COLLINS: First, did Westney choose these numbers, or did you?

MR. KEAN: So the – so, from a strategic risk perspective, we had a discussion amongst their insight as to what they thought it might be based upon what they're seeing. They had given us guidance on that 35 per cent perspective. We gave them what our labour costs would be. So that's how they framed the 350.

MR. COLLINS: And the 35 per cent, that – this risk exists, as I understand it, only at the Muskrat Falls site?

MR. KEAN: That's – this risk, yes. It's a Muskrat Falls specific risk.

MR. COLLINS: And that's because the Muskrat Falls site has a more complex labour agreement?

MR. KEAN: Well, it's a more congested labour with a lot of different work groups. It's where all the transmission line was being deemed to be a wall-to-wall IBEW, it was – I guess we didn't see any risk on jurisdictional issues. There wasn't a concept of work teams that we were trying to promote underneath the Muskrat Falls collective agreement on the – you know, work team is when you got members of various unions working together in a team to do various tasks.

So that wasn't the same on the transmission. So this was a very Muskrat Falls-specific strategic risk that we saw.

MR. COLLINS: So the risk is that this work teams approach doesn't work?

MR. KEAN: That's one element of the jurisdictional element of the problems, yes, that was identified as – flagging it as a concern. Now, of course, there are many aspects of the productivity that could be influencing beyond that of the pure labourer.

MR. COLLINS: Isn't it – isn't it foreseeable at some level that the failure of a labour strategy could lead to an overrun of more than 35 per cent?

MR. KEAN: This under a pure – if you looked at a broader failure of your entire labour strategy, of course, this risk – we did not see that as a failure. You know, the aspect of – we had, at this point in time, very positive relationships, positive interactions with the unions in terms of the collective agreements. So that wasn't deemed to be a – you know, that we – you know, we knew there might be some challenges but it depends. Again, you can – it depends on how the agreement would be executed and implemented by a contractor or contractors.

MR. COLLINS: And returning earlier, so Westney suggested these numbers to you and you accepted them? Is that – that's what I took from what you just said. Is that –?

MR. KEAN: There was some discussion around these items but, particularly, on the productivity side that would have been a Westney view because they had – they were doing a lot of deep work in productivity and performance in various jurisdictions. You know, other strategic or key risks that we had, of course they would have sought would have been – they would have asked for our viewpoint, asked us some difficult questions, but at the end of the day it would have been a Nalcor decision as to where things were.

But, purely from a labour productivity, you know, as I recall it was – is, you know, they sized the exposure rates from what they knew and what – and part of that is driven by the confidence that, you know, SNC expressed in the quality of the estimate; Paul and others that were involved in this, the benchmarking that had been done against other comparable projects. So people felt very comfortable with the performance rates, the productivities, you know, positive momentum with unions. So – however, it was recognized if things don't go well, this is out there.

MR. COLLINS: The Commission heard evidence from Keith Dodson of Westney that even though the project – the productivity rates that were originally achieved on the project, after the initial stumbles, even though those

productivity rates were half as good as estimated – meaning it took twice as many hours to accomplish the same work – those productivity rates are still pretty good compared to lots of other projects worldwide.

And that testimony is difficult to square with the idea that Westney evaluated the worst-case scenario as being a 35 per cent labour overrun, or productivity 35 per cent worse than estimated. Do you have any comments on that?

MR. KEAN: Well, I guess Mr. Westney is making his comment – or Mr. Dodson I should say – recently with the information that he has. This is a 2012 study, the discussions that we had and their reviews on what they were seeing in the marketplace at that point in time.

MR. COLLINS: I believe Mr. Dodson said that even as of 2010 lots of projects worldwide were doing worse than twice as well as – worse than half the productivity that was estimated.

MR. KEAN: So I understood – I did take a skim through Mr. Dodson's testimony. I thought he felt he was – you know, part of their influence was that, you know, people felt very comfortable with the estimate, the base estimate. The SNC estimators felt good with it, the construction folks, you know, felt it was very, you know – from the productivity norms, looking at other projects, they thought it was good.

MR. COLLINS: Who –

MR. KEAN: As did Mr. – you know, when we look at the two shadow estimates that had been done for the powerhouse, being one done by Mr. Mulcahy and the other done by Mr. Paul Hewitt. So those are things that help condition an assessment of the risk exposure.

MR. COLLINS: Well, I understand that the other place that labour productivity risk was incorporated was the tactical risk analysis. And my understanding of how the tactical risk analysis worked was that for each of a range of package – the project was broken into various packages and for each package, a best-case and a worst-case scenario was chosen. Is that broadly right?

MR. KEAN: That's correct, based upon the identified tactical risk and the general parameters regarding the inputs to the estimate. I like to call it sometimes estimate uncertainty.

MR. COLLINS: So if we go to – staying inside this document, P-00130, at page 239 we see, again, a number of packages. And for each there's the DG3 estimate and a best cost in blue and a worst cost also in blue. And, again, my understanding is these best costs and worst costs would have been fed into a Monte Carlo simulation by Westney.

MR. KEAN: Yeah, Westney has a model and they take, you know, the estimate and – that's right. It goes in – it's their modelling methodology.

MR. COLLINS: (Inaudible.)

MR. KEAN: A bit of a black box to us, to a degree.

MR. COLLINS: Yeah.

And all else being equal, if your worst cost is close to your DG3 estimate, that will imply a smaller contingency. And if it's larger, that will imply that you'll need a larger contingency and the opposite way with best cost.

MR. KEAN: Notionally, yes.

MR. COLLINS: Yeah.

So I'm going to run through a number of the largest line items to give a sense – the Commissioner a sense of how wide the range is, in this case, from best to worst – or just from the estimate to the worst case.

So, first, on page 241 we have, I believe, the largest package which is the contract for the intake, powerhouse, spillway and transition dams. It's farther down the page – up a little.

And the DG3 estimate is \$690 million – 690.1. And the worst cost – the worst-case scenario is \$765 million, is that right? So the worst case is about 11 per cent above the estimate. Is that right, Mr. Kean?

MR. KEAN: I think –

MR. COLLINS: Yeah.

MR. KEAN: – generally speaking, from an arithmetic perspective, yes.

MR. COLLINS: And the second-biggest package is on page 245. It's the converters. And in this case the DG3 estimate is \$378 million and the worst case is \$406 million. So the worst case, in this case, is 7 per cent above the estimate.

And the third-biggest package is on page 246. It's the construction of the Island portion of the Labrador-Island Link. A little farther down – there it is, section 1. Scroll up a little – up, up. There we are, "B.h – Construction of 350 kV HVdc Trans. Line – Section 1." The DG3 estimate here is \$368 million and the worst case is \$410 million, which is 13 per cent above the estimate. Is that right?

MR. KEAN: Sounds about right, yes.

MR. COLLINS: And, again, if we look in the description this analysis is quite well documented. And we see that this is: "Driven by Performance Risk associated with the remoteness of the region and difficulties associated with the terrain and limitations of access" Is that the primary driver of that worst-case scenario?

MR. KEAN: I don't know if one would be primary. I can't recall in the way this was documented, but certainly –

MR. COLLINS: But –

MR. KEAN: – yes –

MR. COLLINS: But in addition –

MR. KEAN: – these are key drivers.

MR. COLLINS: In addition to a significant performance risk, this also includes the geotechnical risk we described earlier, and it also includes the ongoing scope change and design and the ongoing engineering. Is that fair, Mr. Kean?

MR. KEAN: Well, the aspect of the geotechnical, it would encompass any uncertainty.

MR. COLLINS: Any uncertainty.

MR. KEAN: Not scope – except a major scope change.

MR. COLLINS: And so the fourth-biggest package on page 239 is the EPCM services. And the DG3 estimate here is \$552 million and the worst case is –

MR. KEAN: 352.

MR. COLLINS: 352, sorry. Thank you.

And the worst case is 450. And so in this case I have the worst case being 28 per cent above the estimate?

MR. KEAN: Yes.

MR. COLLINS: Now, this doesn't include historical cost as I understand it.

MR. KEAN: No, it doesn't.

MR. COLLINS: So we have to add about \$50 million to each of those.

MR. KEAN: That's right.

MR. COLLINS: So the worst-case scenario, including historical cost, is \$500 million.

MR. KEAN: Correct.

MR. COLLINS: But that's still \$176 million less than SNC's estimate.

MR. KEAN: That's correct.

MR. COLLINS: The –

MR. KEAN: So that's how – it should give you an indication of how far we thought SNC's December 11 estimate under the new leadership was from where we thought its original proposal would be.

MR. COLLINS: It does give an indication.

The fifth-biggest package is on the same page and it's the owner's project cost. Here the DG3 estimate, \$218 million, and the worst-case scenario is \$243 million, which is 11 per cent above the DG3 estimate. That right, Mr. Kean?

MR. KEAN: That's right.

MR. COLLINS: So I'm going to suggest that the worst-case scenarios are implausibly optimistic and that it is hubris to think that you can predict all the uncertainties of construction so perfectly that the worst-case scenario is only 10 per cent worse than your estimate.

I expect you have some thoughts about that.

MR. KEAN: Well, what I can tell you is that we went through a risk analysis process whereby we identified risk; we tried to look at quantifying those. We had lots of discussions over time, various workshops, to get thoughts of which landed in a viewpoint.

That eventually resulted in a modelling exercise that produced the contingency curves that we have today as part of the DG3. And these are the numbers that went into that, that were utilizing the best available information and insights that we had at that point in time.

MR. COLLINS: And you felt at the time that your information was so good that the worst case was no – was in most cases no worse than 10 per cent above your estimate.

MR. KEAN: The team felt comfortable with where things were at that point in time, yes.

MR. COLLINS: If we focus, for example on the HVDC line, in that case you have a recommendation for further geotechnical work. And you've decided to postpone that geotechnical work, do your estimate now without that information and – but you're confident that whatever the information is, it still can't be any worse than 13 per cent.

MR. KEAN: Because the aspect that comes back – two things: one you've already – in the budget, you've got money for the geotechnical program should you wish you actually get it; two, and more importantly, was the comment that was made and stated in the Basis of

Estimate from SNC of being comfortable and confident in the total quantum and distribution within a – for the foundation types.

So with that –

MR. COLLINS: Is the comment that you're comfortable with information as part of a base estimate – does that imply that there is no uncertainty or that the uncertainty is small?

MR. KEAN: It gives an indication of what the uncertainty range might be. Yes, it gives people a viewpoint as to what that could be and what it may not be. And that's, you know, part of those discussions and thoughts that would occur to give shared perspectives.

MR. COLLINS: Okay, Mr. Kean.

So I'd like to confirm that key risk generally means strategic risk.

MR. KEAN: Generally.

MR. COLLINS: And if we go to P-00130 at page 17 – that's the same document – it says: "For DG3 the assessment of financial exposure builds upon the detailed Strategic Risk Frames prepared in fall 2009 and subsequently stewarded by the Risk Resolution Team, recapped in recurring risk workshops."

Is that right that the key risks for the project were identified, most of them, in 2009?

MR. KEAN: That's largely correct, yes. Yeah, that's correct.

MR. COLLINS: And by DG3 most of these 2009 risks were closed and for –

MR. KEAN: Or the residual value – the risk may not have been closed but the residual value of the effort was planned in the base estimate. So labour relations – if you had done the work on labour relations strategy, for instance, you would have had labour relations people as part of your organization that's reflected in your base estimate.

MR. COLLINS: And an example is that one of the risks from 2009 – it was an opportunity – was the availability of a federal loan guarantee.

That was a source of significant uncertainty in 2009.

MR. KEAN: Yes.

MR. COLLINS: But by 2012 you have a memorandum of understanding so that uncertainty had been reduced very significantly. Things looked very different in 2012 than they did in 2009.

MR. KEAN: And I believe that, yes, things did look better or different. There was certainly a lot of work occurring over that period that would change the plans and change the understanding, of course.

MR. COLLINS: And so at the end of this process you identified three key strategic risks: Labour productivity, competition for resources and schedule risk. Is that right?

MR. KEAN: That's right. The other risks; as I said, the residual value was such that the viewpoint was that there wasn't any monetary – significant monetary exposure.

MR. COLLINS: So if we could go now to P-00956, which is binder 4, tab 104. This is the Project Risk Management Plan. And on page 12 – scroll down a little – at the bottom of the page we see: "Consistent with Pareto's Principle" – you wrote this document, is that right, Mr. Kean?

MR. KEAN: Yes, I think this revision I wrote. Yeah, there was a subsequent revision, sorry. If this is B1, I wrote Rev. B1. It would say at the top.

MR. COLLINS: So "Consistent with Pareto's Principle, we believe a few, select, complex risk (15 – 20) will provide the greatest exposure for the Project." Is that accurate, Mr. Kean?

MR. KEAN: That was basically the viewpoint. And some people, like Mr. Dodson, would say it's five, as an example. He used to challenge me and say it's much less than that.

MR. COLLINS: Well, this is the question I have for you: How did you end up with only three key risks instead of 15?

MR. KEAN: Oh, because the aspect of – we had, I think, 30-odd in the 2008 period. And, of course, the effort – each of those risks in the original QRA work that had been done for Gull Island showed they had exposure. Of course, plans were put in place to mitigate many of those.

You know, the organization, the project characteristics changed considerably. It was Muskrat Falls. We were now – it was a new – we had an EPCM consultant on board, we had – you know, there were plenty of things. Legislative changes may have been made to create Nalcor Energy as an example – many things.

MR. COLLINS: Well, that's exactly – many of the 2009 risks had been eroded away by the passage of time, but no new risks are being added. Isn't the fact that you're down to only three risks – doesn't that suggest that maybe you're missing some?

MR. KEAN: No, not from an execution perspective because we looked at it from – we still have a lot of other risks, but we saw these three major risks that were driving the execution period.

MR. COLLINS: So in November you gave some evidence about various key risks that weren't quantified. I don't – I'm not going to return to all of that but I wanted to return to it – two of them. The first one is the – you discussed, I believe, in November how Nalcor chose not to quantify the risk of significant reliability increases. And now – you've now given us more context about the way in which reliability was being – that was an ongoing scope change at the time the risk workshop was held?

MR. KEAN: Yes.

MR. COLLINS: Did no one mention that scope change? Did no one consider that that maybe should be added as a potential strategic risk?

MR. KEAN: To be quite honest I can't recall the particulars, but looking back, yes, certainly.

MR. COLLINS: And my second – I believe you testified in November about how Nalcor

chose not to ask a strategic – add a strategic risk, reflecting the ongoing breakdown in the relationship with SNC-Lavalin – with the ongoing difficulties in the relationship with SNC-Lavalin that eventually led to the termination of the EPCM relationship.

MR. KEAN: There was no strategic risk identified there because it was an item that was underway.

MR. COLLINS: So Mr. Dodson testified – and you've referred also – to the possibility that when questions were raised about SNC-Lavalin's ambitious labour productivity targets, SNC-Lavalin responded that they were confident they could achieve those targets. But what you didn't say today, but what Mr. Dodson said, is that the reason that they were confident was that they were going to bring the same team that had achieved those targets in the past. Is that accurate?

MR. KEAN: I've never heard that before.

MR. COLLINS: You've never heard that before?

MR. KEAN: No, I have not.

MR. COLLINS: But –

MR. KEAN: Because at the end of the day SNC is not doing the work, it's the contractors. Productivity and front-line productivity – following the completion of engineering and the, you know, establishment of a good collective agreement and good amenable site conditions and so on, front-line productivity is in the hands of the construction contractor.

MR. COLLINS: That would –

MR. KEAN: So I struggle with that, how they would be bringing that team unless it was the same contractors.

MR. COLLINS: Right.

Mr. Dodson also testified that he advised Nalcor in 2012 that there was a significant ongoing political risk referring, for example, to the possibility of a change in government or legislation. And he says that Westney saw that

risk as being perhaps \$300 million, that Nalcor felt it was substantially mitigated. Do you recall that?

MR. KEAN: I don't recall particulars but what I do know that – is that we had a risk called – Nalcor being an entity of the Crown corporation that Mr. Dodson flagged to us very early in 2008, and that risk got a lot of attention. And there's no doubt that he probably – he continued to flag it in 2012.

The viewpoint would have been from, you know, Mr. Bennett in particular, that, you know, things are sorted out. That risk is pretty small today considering where we are as an organization, entity. The relationship with the Crown is different. We have a – we have put the legislative mechanisms in place. You know, there's good communication with the area of expertise.

MR. COLLINS: So Mr. Bennett felt he had mitigated the risk of a change in government?

MR. KEAN: I don't know if the risk really was change of government. It would be an entity of the Crown is what I – you know, being Nalcor, Newfoundland and Labrador Hydro was a Crown corporation. That comes with a lot of unique obligations and perhaps restrictions, so ...

MR. COLLINS: Those are my questions about this, Commissioner.

I believe Ms. Muzychka has some other questions.

THE COMMISSIONER: Okay.

Ms. Muzychka.

MS. MUZYCHKA: All right.

I want to ask you about the 2013 SNC risk report and that is found at P-01977. We don't need to bring it up right now, but when were you first aware that SNC-Lavalin had conducted work that went into their April 13 risk assessment report?

MR. KEAN: Well, when I – 2017, when I saw it in the – it was a news item – was when I

thought I was, but then there has been exhibits shown that there was a communication on it in 2013 where I was asked by Mr. Paul Harrington whether I had seen it. And I advised, no, I had no knowledge of it, so ...

MS. MUZYCHKA: So you didn't learn of the report until 2017.

MR. KEAN: That's correct.

MS. MUZYCHKA: And you had no knowledge of it prior to that?

MR. KEAN: Only what Mr. Harrington had hinted there's some sort of risk assessment that's been done further to his conversations that he had heard. But what that looked like and what it had been, I had never heard from anything after.

MS. MUZYCHKA: Okay. Well, how about if we look at Exhibit P-03159? It's at tab 24 of binder 2.

All right, let's turn to page 2 of that exhibit. Scroll down to where the email chain starts with Gilbert. Okay. So that's an email that's dated May 29, 2013.

MR. KEAN: Yes.

MS. MUZYCHKA: And have you seen that email chain before?

MR. KEAN: That's the one I was just referring to a moment ago that's come forward since this period.

MS. MUZYCHKA: Okay but you just said that you hadn't heard anything of the – or the SNC report until 2017.

MR. KEAN: That's correct. Until I started my discovery and this email has come forward.

MS. MUZYCHKA: So this refreshed your mind that you had seen the report in 2013?

MR. KEAN: No, I had not seen the report. I had been made aware that there was some sort of risk review underway through –

MS. MUZYCHKA: Okay, so you were (inaudible).

MR. KEAN: – by Mr. Harrington.

MS. MUZYCHKA: But, initially, you thought it was 2017 when you first heard of the SNC report?

MR. KEAN: Well, 2017 was when I first heard a report was produced.

MS. MUZYCHKA: Okay.

MR. KEAN: And I could not, in searching my memory banks, ever think of anything associated with it. When this came up – this email you indicated that – you know, this is the only one that I’m aware of – is that it says that – you know, that a report – Mr. Harrington is saying a report is being done. I had no knowledge of that is what I indicated to him.

MS. MUZYCHKA: Okay.

And in the email that Mr. Harrington writes, he says that he had met with Normand and J. D. Tremblay, the risk persons yesterday, and asked for clarification on the risk analysis that was carried out on the project. And then if you just go on to – he says: “The status is that a draft is with B Gagne and Scott Thon and they may be thinking about providing it to us. I would respectfully decline that offer because of a number of very important factors”

And the first one is, he notes: “Because the work was based on the same source data that Westney used there is nothing new here – Risk wise.”

And then he mentions number 2, that: “The risk analysis shows the unmitigated risk and cost result and is not a probabilistic analysis using Monte Carlo sampling techniques – so the results will be subjective in interpretation and will not reflect the mitigations we have implemented or the cost result of the mitigations – i.e the results will be misleading and inaccurate.”

Do you recall having a discussion with Mr. Harrington about that?

MR. KEAN: No, I don’t.

MS. MUZYCHKA: Okay.

And then he goes on to say: “We have had no opportunity to challenge the assumptions or factual accuracy of the input data and we really do not have the time or inclination to do so – we need to focus our efforts and resources on the risks going forward”

So then he goes on to recommend that “we talk to Scott and reassure him that we realize there was no mal intent,” however, we would prefer it remained a draft internal document.

In your response, you indicate: “One point of note – SLI did not have access to any data from these sessions.” So what sessions were you referring to? Were those the risk analysis workshops that you held in 2012?

MR. KEAN: Yeah, I guess that would be it. Yes.

MS. MUZYCHKA: Okay.

And is it your recollection that SNC was not involved in the two days of risk analysis; they weren’t involved in the strategic analysis?

MR. KEAN: They weren’t involved in the strategic – day two of the analysis, that’s correct.

MS. MUZYCHKA: Okay so –

MR. KEAN: They were involved – they provided input for the aspects around the productivity and performance aspects, but day two had to deal with – well, it’s more in strategic and environmental assessment – Strait of Belle Isle for instance – than SNC was involved in, the aspects of the owner’s cost, Aboriginal front. So it’s a lot of different things.

MS. MUZYCHKA: Okay.

So you confirmed then to Mr. Harrington that SLI – or SNC-Lavalin – they only participated in some of it and you provided none of it to them. And then you make a further comment but – so as far as the SNC risk analysis report, their analysis was independent of any information that Nalcor had obtained in the process of doing its Westney analysis.

MR. KEAN: Not entirely correct. One thing I’d just point – point of note, is that we were using

the SNC risk database as our risk register. So as part of the EPCM services, they provided a risk manager. That database that SNC brought to the table was what all of the project risks were logged in. And I – J. D. – well, it was up to this – up to sanction it was a gentleman, Yuri Raydugin, that was responsible for that, and in about – sorry, not sanction, in mid-2012.

And then it transitioned to J. D. so he did have access to all the risk and the quantification, or qualitative assessment they got – not a quantitative assessment. And, you know, looking back, maybe they had the full QRA document. It was in the document control system, so they would've had access to that as anyone.

MS. MUZYCHKA: Okay.

Did you get the sense from Mr. Harrington's email that he had read the report, or he was merely aware of the report?

MR. KEAN: No, I got the sense he had a – that day he met with them and there was a meeting and they talked about what they had done and – but I never got the sense that he had a report –

MS. MUZYCHKA: Okay.

MR. KEAN: – otherwise, I figured I would've got a copy, to be honest.

MS. MUZYCHKA: Sure. And it was, in fact, his distinct view that it would be better not to receive the report. Is that correct?

MR. KEAN: Yeah, that's what he says here in this second paragraph from the bottom, yes, be maintained as a draft internal document.

MS. MUZYCHKA: And not presented to us.

MR. KEAN: Yes.

MS. MUZYCHKA: Because once it was presented to you, you would have to review it and probably action it.

MR. KEAN: I had no idea why.

MS. MUZYCHKA: Okay.

MR. KEAN: That's a question best asked to – answered by Mr. Harrington, I guess.

MS. MUZYCHKA: Did you agree with Mr. Harrington's view that it would be better not to receive the SNC draft document?

MR. KEAN: I had really no view on it. I guess my main concern is that are there risks that we're aware of? Is there a viewpoint? Can we look at it? And I think, most importantly –

MS. MUZYCHKA: You would have wanted to have seen it.

MR. KEAN: I think it's always good to look at it from a perspective and understand why it was put together. Is there new information? Is there new methodology? And I – you know, we had the SNC corporate risk manager. Rick Cox was engaged early and, you know, I was hoping he would come back to do some risk sessions for us post-DG3.

So, you know, I – whatever is out there I'd like to have a look at, I guess.

MS. MUZYCHKA: Okay. But you didn't say –

MR. KEAN: Like, you know, the aspect of you responding is the same risk, I would think, you know, so ...

MS. MUZYCHKA: But wouldn't you be interested in seeing it to determine whether or not there was information there that could be of value?

MR. KEAN: Well, if it was materially relevant, it'd be interesting, you know – me – not only me but other people in the management team, I guess.

MS. MUZYCHKA: Sure. Okay.

But you didn't state that in your response back to Mr. Harrington.

MR. KEAN: Well, Mr. Harrington said he didn't want it. So it's not much good for me to ask Mr. Harrington (inaudible) expect for it, but he's not –

MS. MUZYCHKA: No, but you certainly –

MR. KEAN: – he doesn't have it.

MS. MUZYCHKA: – could have given him your input and suggested to him what you've suggested there today, that it would not hurt to review the report and determine if there are any new risks identified in there or other information that could be of relevance to you.

MR. KEAN: Well, I can't, you know, speculate why I didn't or did not state. I know – I guess it's clear what I said there at that point in time.

MS. MUZYCHKA: Okay.

So, as I understand, SNC-Lavalin was brought in to the project because of their extensive hydro experience.

MR. KEAN: Yes.

MS. MUZYCHKA: And so, therefore, wouldn't the input of SNC on mitigation strategies and effectiveness of risk management been of interest or value to you and your team?

MR. KEAN: Of course and it was. That's why they – if you look at the risk register, it's very detailed as to those management. They were responsible for managing those risks for the most part. The actions were to their team.

MS. MUZYCHKA: Okay. But you don't know whether or not, in their new report, whether they had identified new risks or had addressed –

MR. KEAN: Well, I would expect, as they were accountable, and J. D. in particular, for maintaining the project risk register which was in the SNC system. It was hosted on SNC's platform and they would send to the rest of the team Excel data dumps of that. If there were new risks, I would expect it would be his obligation to put them in a register early.

MS. MUZYCHKA: Mm-hmm.

MR. KEAN: So – and, you know, we had a means that every month there was updates being provided as part of the monthly reporting cycle. So there shouldn't have been – you know, it would have been his obligation if a risk is identified to log it in the register.

MS. MUZYCHKA: Okay.

MR. KEAN: That's what he was – his role was.

MS. MUZYCHKA: But that's not what the report was about. It wasn't simply an identification of the risks.

MR. KEAN: No, it would have been a – as I understand now, today, it's an expected value approach where they looked at the expected impact of the risk itself, but those features are in the database to use.

MS. MUZYCHKA: But they're not organized and prepared into a report identifying risks and mitigation strategies –

MR. KEAN: It is, yeah.

MS. MUZYCHKA: – et cetera.

MR. KEAN: Yeah.

MS. MUZYCHKA: It is?

MR. KEAN: Yeah, the actual printout is – in the SNC risk report is almost identical to what the printout of the SNC risk register that they were issuing to us every month or so.

MS. MUZYCHKA: So if they were a key part of the risk assessment process, why wouldn't they have been involved in the meeting in which you discussed strategic risk? Why wouldn't their input have been –

MR. KEAN: They were – so, perhaps –

MS. MUZYCHKA: – considered valuable?

MR. KEAN: Perhaps it was the wrong word there from my side to say. Day two really focused on scope outside SNC's responsibility, so everything associated with Muskrat Falls.

So Mr. Collins was speaking about the labour productivity. So the framing of that key risk, for instance, SNC gave a view on the labour hours, SNC gave a view on what the productivity was today to Westney and the view of what the labour rates, the all-in labour rates were. So, you know, they're involved in that.

Just like I asked Mr. Lemay and I know there's – we had communication in Phase 1 about the placement rates of concrete and the time-risk exposure. So whether it was in – some of it was in day one of the workshop and some of it was thereafter, but they're involved; you know, I sought all that input to that.

And day two encompassed going through this detailed key risks, the 34 that existed before, and talking about whether that was relevant today. So did we have an Aboriginal risk with, you know, with the Innu Nation? Did we have any other, let's say, stakeholder risk? Were there risks associated with the generation EA release? Were there risks associated with project splitting underneath the generation EA?

So SNC – that wasn't their area of responsibility so they weren't involved in those discussions, I guess. Quite simply, from a matter of you invite people to a meeting that you – that's their responsibility. You just don't invite them for courtesy in that regard. We got a lot of things to be done.

MS. MUZYCHKA: Well, as I understood, those meetings workshops were to brainstorm the risks.

MR. KEAN: No, the brainstorming – no. So the brainstorming had been done starting in September of 2011. We spent four days at the Johnson GEO CENTRE, which gave the original risk register that was reviewed monthly, combined with a new workshop on the 15th of November of 2011 wherein we reviewed the estimate. And there were some subsequent workshops for transmission line and each of the subcomponents in the winter of 2012.

So at the workshop was focused on looking at these risks and correlating them to the estimate uncertainty that we saw. So not identification at that point in time, the identification was big workshops at the beginning and ongoing day by day. Now we're taking that data and trying to look at what it means from a cost and schedule perspective.

MS. MUZYCHKA: Okay.

MR. KEAN: So the identification had been done.

MS. MUZYCHKA: Well, what did you mean then in your email, that you had not provided any of the data regarding the risks to SNC?

MR. KEAN: J. D. didn't get the final modelling, I guess, the strategic risk curve. I don't know, I don't think SNC saw that initially. So the schedule that showed the low P, as an example.

MS. MUZYCHKA: Okay.

So the – SNC wasn't up to speed on everything that you were doing with –

MR. KEAN: Well –

MS. MUZYCHKA: – respect to your risk analysis?

MR. KEAN: No, there were owner-related things and SNC – I don't know if SNC really knew what level of contingency or what level reserves Nalcor would have. Likewise, it wouldn't have been their responsibility – or how much money we carried for the Strait of Belle Isle crossing or how much money we carried for the owner's team. You know, that was out in Nalcor's scope.

So SNC had a scope of responsibility within the EPCM services that had to deal with Muskrat Falls generation, the transmission line and the converters. So that's what – in the Basis of Estimate I talk about that's what they were responsible for preparing the estimate on. Likewise, it was what they're responsible for assessing the risk on. So there was a separate Strait of Belle Isle crossing risk register that was done by that team. So SNC did not have involvement in that, for instance.

MS. MUZYCHKA: Okay but, you know, I'm looking at the email from Mr. Harrington, and he says in his first factor, number one: "Because the work was based on the same source data that Westney used there is nothing new here – Risk wise." And then you respond: "One point of note – SLI did not have" any "access to any data from these sessions."

MR. KEAN: Well, I guess the clarification I would add there is they didn't have the final cost models; they had all of the risk itself. They had

the estimate for the scope within their services; they had the detailed risk register with the actions. It came out of their system. Yuri Raydugin sent it to us for the risk workshop.

So what they didn't have was the final risk report from Westney showing the strategic risk curves and the framing of that labour risk from zero to 350. They didn't have that, no.

MS. MUZYCHKA: Okay.

MR. KEAN: But they had all the risk itself –

MS. MUZYCHKA: Well, I'm suggesting –

MR. KEAN: – that were identified.

MS. MUZYCHKA: – to you that you were communicating to Mr. Harrington that the work is not based on the same source as the Westney data. There's nothing new here. But, yet, there is information that you have and you make a point of saying that they didn't have access to any data arising from these sessions.

MR. KEAN: Well, this – I think the most important thing is that data at the end of the day would've been outdated.

MS. MUZYCHKA: Okay, but you're still –

MR. KEAN: You know, it –

MS. MUZYCHKA: – acknowledging that in fact, they didn't have all of the data.

MR. KEAN: They had the most important data which was the risk and the cost estimate.

MS. MUZYCHKA: All right. Well, let's leave that for a moment.

So then we know that Westney was engaged in 2017 by – I think it was Mr. Harrington requested that Westney review the SNC 2013 report.

MR. KEAN: Yes.

MS. MUZYCHKA: And I understand that you had done some work for Westney after you left Nalcor.

MR. KEAN: Not associated with this risk report.

MS. MUZYCHKA: Okay.

MR. KEAN: I did do some work through Westney for Nalcor's 2017 QRA –

MS. MUZYCHKA: Okay, but you –

MR. KEAN: – for Muskrat Falls only.

MS. MUZYCHKA: So are you saying that you had no involvement whatsoever in the preparation of Westney's 2017 report in which they reviewed SNC-Lavalin's report and the Westney – the original QRA report?

MR. KEAN: No, I was just clarifying two separate pieces of work.

MS. MUZYCHKA: Okay.

MR. KEAN: So I –

MS. MUZYCHKA: So what was your involvement with the 2017 Westney report?

MR. KEAN: Concurrent to when I was doing some of the work on that famous five-volume set that talks about some of the post-sanction events, I spent two or three hours going through the draft SNC risk report for Nalcor to look at and compare – do a quick comparison to be fed as input into Westney of the relationship between the risk that SNC had identified in 2013 and what was in the various risk registers used to form the basis of the 2012 QRA.

MS. MUZYCHKA: Okay, so you had involvement in reviewing the work of SNC-Lavalin against work that you had been involved in while you were with Nalcor.

MR. KEAN: I was comparing the risk registers to see if they were one in the same.

MS. MUZYCHKA: Okay.

MR. KEAN: And I spent a couple of hours doing that.

MS. MUZYCHKA: And did you feel, or could you see, that there may be a conflict of interest in you being involved in a review?

MR. KEAN: I provided one input to Nalcor, so I don't know at the end of the day if that's the input that went to Westney. I just gave Mr. Harrington a list: This one, go to this, give that some consideration.

I don't know if it's a conflict of interest. It should be just fairly factual whether it's the item or not. Is it the same risk or not when you interpret and go through the risk.

MS. MUZYCHKA: So was it Mr. Harrington that asked you?

MR. KEAN: Yes, yeah.

MS. MUZYCHKA: Or was it Westney that asked you?

MR. KEAN: No, no, it was Mr. Harrington.

MS. MUZYCHKA: So you weren't –

MR. KEAN: I was working – providing some services to Nalcor on a part-time basis.

MS. MUZYCHKA: Okay. And as part of that they asked you to do a review of the SNC report.

MR. KEAN: Can you – we're doing – basically, as it was framed, we're – Westney is doing this comparative analysis for us. We're going through – Nalcor – we're going through and looking at the DG3 risk report, comparing it. Can you have a look at this for us too?

MS. MUZYCHKA: Do you think that you would have approached that in an objective manner, given the viewpoint of the project management team leader, Mr. Harrington, that the SNC report disclosed nothing new and therefore he was justified in refusing it.

MR. KEAN: Well, as I said at that point in time, it didn't even ring bells that the 2013 risk report had existed, to be quite honest with you –

MS. MUZYCHKA: But, regardless, you're looking – you're essentially reviewing a report

by SNC-Lavalin and you're comparing it to see whether or not there was anything new.

MR. KEAN: Sure, and in that regard –

MS. MUZYCHKA: And wouldn't it be in your interest –

MR. KEAN: – Westney would be providing, I guess, the most objective viewpoint. So I was giving raw input to Mr. Harrington that I assume went to Westney.

MS. MUZYCHKA: And what was the nature of that raw input?

MR. KEAN: Basically, there – here's a listing of some of the big-ticket risks that – the very high risks that SNC have identified. SNC's risk report identifies them as very high exposure – high, moderate, low, I think. I was asked to look at the very high ones to see if there was any correlation with the Nalcor risk report.

I didn't get into the details of that in terms of high, moderate and low until last week when you brought it up to me in discovery. Then I took some time on the weekend to go through. And there's – is it 100 per cent, but there's a lot of risk correlation that Westney didn't put in their report, unfortunately.

So it would be a good exercise to finish that correlation because, almost exclusively, either in the SNC risk register or the Nalcor one, you could – the risk is the same.

MS. MUZYCHKA: Okay.

MR. KEAN: So I –

MS. MUZYCHKA: We'll go through those. We'll start – you've been provided with a binder that's on your side table there and it hasn't –

THE COMMISSIONER: I'm just going to just stop you there.

MS. MUZYCHKA: Okay.

THE COMMISSIONER: Is – I notice that it's almost quarter to 5. I'm just wondering how much longer do you expect to be on this point?

MS. MUZYCHKA: I would say it could take us up to a half hour, 45 minutes to review the full report –

THE COMMISSIONER: Okay.

MS. MUZYCHKA: – or the analysis that we’re going to do.

THE COMMISSIONER: Can I just get a feel from everyone as to whether or not – if we start at 9:30 tomorrow morning whether or not there’s a good chance we would finish by 4:30, 5 o’clock tomorrow afternoon with cross-examination from everyone who is intending to cross-examine Mr. Kean?

I just want to just get a feel for this because then I can look at starting a little earlier tomorrow morning if we need to.

MR. SIMMONS: Commissioner, speaking for Nalcor we don’t expect to be very long with Mr. Kean.

THE COMMISSIONER: Okay.

Any others?

MR. BUDDEN: Yes, we intend to cross-examine. I doubt it would be a half hour.

THE COMMISSIONER: Okay, so –

MR. BUDDEN: Significantly less perhaps.

THE COMMISSIONER: Mr. Smith.

MR. SMITH: From my perspective about, maybe, 15 minutes, 20 minutes.

THE COMMISSIONER: Okay.

So I’m gathering here, based upon what I’m hearing, that we’ll have a good chance of finishing tomorrow. So I think what we’ll do is we’ll adjourn now until tomorrow morning, just to go into this line of questioning then. And we’ll start at 9:30 tomorrow morning, all right?

All right, we’re adjourned until tomorrow.

I do want to recognize the attendance of an articling student here. And I usually always – if I

was in a courtroom I’d always welcome the – somebody new to the profession. So I don’t think I know your name but maybe you could identify yourself for me, please.

MR. ESCOTT: Hi, good afternoon.

My name is Rob Escott.

THE COMMISSIONER: Okay, well, welcome Mr. Escott.

I hope that this is a bit of a learning experience, anyway. It certainly is one for me so ... anyway, hopefully it is for us all. Anyway, welcome.

All right, we’re adjourned ’til tomorrow morning at 9:30.

UNIDENTIFIED MALE SPEAKER: Thank you.

CLERK: All rise.

This Commission of Inquiry is concluded for the day.