COMMISSION OF INQUIRY
RESPECTING THE MUSKRAT FALLS PROJECT

Transcript | Phase 2 Volume 15

Commissioner: Honourable Justice Richard LeBlanc

Thursday 21 March 2019

CLERK (Mulrooney): All rise.

This Commission of Inquiry is now open.

The Honourable Justice Richard LeBlanc presiding as Commissioner.

Please be seated.

THE COMMISSIONER: Okay.

All right. Good Morning.

Ms. O'Brien.

MS. O'BRIEN: Good morning, Commissioner.

Our witness this morning is Dr. Jim Gilliland. He's here as representative of Williams Engineering. Dr. Gilliland is one of four authors of a report that has already been entered into evidence as Exhibit P-01678. This report was referred to in Grant Thornton's construction phase audit report and referenced in the testimony of Scott Shaffer in – at the beginning of Phase 2.

So the report is already in evidence. Dr. Gilliland is here today to present the findings of the report and be questioned on them. He is one member of a team of four who prepared the report, although, he is here willing and able to speak to the entire report being the report of his company, Williams Engineering – the company he works for.

I am going to first review Dr. Gilliland's CV with him and that of the other members of the team. I will be then asking to have him qualified as an expert in the area of engineering in order to support the – an expert who's – has the expertise to support the opinions that are set forth in the report that's been entered. Once I go through his credentials and those of his team, the other counsel will have an opportunity to question him on his credentials before we continue on with the evidence.

THE COMMISSIONER: Okay.

MS. O'BRIEN: Thank you.

All right. We'll begin by having Dr. Gilliland affirmed, please.

THE COMMISSIONER: Okay.

If you could stand, Sir, please?

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

DR. GILLILAND: I do.

CLERK: Please state your name.

DR. GILLILAND: Jim Gilliland.

CLERK: Thank you.

THE COMMISSIONER: Okay.

MS. O'BRIEN: Thank you, Dr. Gilliland.

Your CV has been entered as Exhibit P-02331. Oh sorry, I should ask the Commissioner for an order to enter the exhibits for today. So that that last statement becomes a true statement.

The – my apologies – looking to enter, Commissioner, Exhibits P-02330 to P-02337.

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

MS. O'BRIEN: Thank you.

All right. P-02331 is your CV; it's at tab 3 of the book before you, Dr. Gilliland.

DR. GILLILAND: Mm-hmm.

MS. O'BRIEN: Can I get you to please give the Commissioner an overview of your education and work history, and in particular if you could highlight the – your experience relevant to the opinions expressed in your report.

DR. GILLILAND: Sure.

Well, in terms of my education, I graduated with my undergraduate degree from Queen's University in Civil Engineering in 1992. I obtained my Masters in Structural Engineering at Queen's University in 1994 and I obtained my Ph.D. in Structural Engineering from the

University of Calgary in 2000 – 2000 and – yeah, 2000.

I'm a member – I'm a member of the – of APEGA, the provincial regulatory body in Alberta, as well as BC and also Newfoundland. And I obtain my registrations wherever my projects happen to take me.

In terms of my project experience over the years, with particular emphasis on projects relevant to this – to this project – I've been involved in various – a variety of industrial types of projects; pipeline foundations; wind power generation foundations; and a variety of projects across the arctic and the northern part of Canada.

And in terms of larger projects, I was involved and did several years of research on the Confederation Bridge project, between New Brunswick and Prince Edward Island. As well a few high-rise – major high-rise buildings in – in Calgary.

MS. O'BRIEN: Okay.

Can you just briefly describe the type of work you've done in relation to those projects?

DR. GILLILAND: So, the pipeline foundations was – is an assessment of the foundations required to support the pipelines in the oil sands in this particular example; and so redesigning effectively – redesigning the foundations for optimal – optimization of them, regarding the geotechnical conditions as well as the structural design of those elements.

In terms of the Confederation Bridge, I was researching thermal and shrinkage effects in high-performance concrete during construction, so I was specifically interested in how the – the structure was built and predicting how the structure would perform during – during construction and henceforth after – after it was built as well/

In terms of high-rise construction the – I was involved with the – the design – concrete design for these – for these buildings as well as estimating quantities for these buildings in terms of assisting with the budgeting and quantities that would be required for construction cost estimates and maintaining construction budgets.

MS. O'BRIEN: Okay, thank you.

Any other – anything else in your CV in particular that you'd like to highlight?

DR. GILLILAND: I guess in terms of the Northern construction, it's quite common – excuse me – it's quite common that the engineers during the design phase would be involved in the construction cost estimates for those projects. So you get – you become familiar with the factors involved in calculating what the budget should be.

MS. O'BRIEN: Okay.

We'll look at this – the CVs of some of the other members of your team, and in particular – perhaps before I go to those members – what sections of your report were you primarily involved with – of the Williams Engineering Report were you primarily involved with drafting?

DR. GILLILAND: Um –

MS. O'BRIEN: And just – it may be of help if we just bring up Exhibit P-01678, which is of that report. Page 4, there is a list of nine areas that the report covers.

THE COMMISSIONER: That's at tab 1.

MS. O'BRIEN: Yes, tab 1. Thank you, Commissioner.

So there's the nine areas there up on the screen.

DR. GILLILAND: Right.

MS. O'BRIEN: So which of those areas would have been, you know, areas that you primarily worked on?

DR. GILLILAND: I personally had some involvement in the forecasting – item number 1. And budgeting. Temporary enclosures, contract structure, work package sizes, project management. Not as much on the productivity factors. That was another gentleman on the team.

MS. O'BRIEN: And who was that?

DR. GILLILAND: And that was Brian George.

MS. O'BRIEN: Okay.

DR. GILLILAND: Schedule – (inaudible) put on that – and the risk in mitigation during sanctioning and construction. And the geotechnical risk and mitigation was primarily by Evelyn Porter.

MS. O'BRIEN: Okay.

We can go to Mr. George's CV. It's been entered as Exhibit P-02332. That would be tab 4 of your binder.

And if you could just give us an overview please, Dr. Gilliland, of Mr. George's credentials, and in particular if he worked on the productivity factors section, highlighting relevant expertise on – in that area.

DR. GILLILAND: Brian George is a very senior mechanical engineer with – I'm gonna say 40 years of experience, primarily in the Arctic and the North. And – so that is his strength in terms of his experience to bring to bear on this project. And as part of these projects, as I said, you – your – he would be – he would have been responsible, in large part, for the design of the projects, but as well as determining – it's very common in the – for Northern projects to come up with construction cost estimates, and determining constructability types of issues, and when and how projects would be built.

MS. O'BRIEN: Okay.

And so would he have had input into some of the other areas of the report other than the productivity factors?

DR. GILLILAND: We all – I guess, all four of us collaborated in a general sense on – in sort of bouncing ideas around and coming to a consensus on all of the sections.

MS. O'BRIEN: Okay.

So he has a fair amount of Northern experience, we can see here from his CV.

We'll go next to Evelyn Porter, whose CV is entered as P-02333.

Can you please highlight for us what Ms. Porter's background is and what she brought to the report?

DR. GILLILAND: Yeah, for sure.

So Evelyn has been with us – with Williams Engineering, I mean – for only about a year and a half; and Evelyn's background is geotechnical, environmental engineering. And she has a variety of – or extensive experience and breadth of experience in dealing with, obviously, civil engineering types of issues, specifically of a geotechnical and environmental engineering nature.

She has experience in – on mining projects, roads and highways, pipelines – in terms of determining right-of-ways as well as alignments for them – and geotechnical studies for things like communications right-of-ways as well as routing of communications towers and these sorts of things.

MS. O'BRIEN: Okay, thank you.

And, finally, Nat Zaccaria, P-02334.

DR. GILLILAND: So Nat is a – has been a project manager with Williams Engineering for 20 years and – or longer, actually, but as a project manager for 20 years and prior to that as a structural or civil engineering technologist. And – so his – he has had extensive experience dealing with contracts of – for projects in Alberta as well as in the Arctic and the Northern projects as well.

And so that's – so that was – Nat played an – ultimately, a relatively minor role in the overall project, but did have inputs through the general consultation between us as a team.

MS. O'BRIEN: Thank you.

Commissioner, I will – that completes my overview of the credentials of the Williams Engineering team. Other counsel may wish to ask questions.

THE COMMISSIONER: Okay. All right.

On the issue of qualification – Province of Newfoundland and Labrador?

Nalcor Energy.

MR. SIMMONS: Good morning, Dr. Gilliland.

DR. GILLILAND: Good morning.

MR. SIMMONS: Dan Simmons. I'm representing Nalcor Energy, and I do have some questions for you about your background and credentials and those of your team.

First question though – I hadn't realized, from looking at your report, that this was a collaboration of four people and I note now that there is no author noted on the report but in fact I understand that all four of the identified people have collaborated to prepare the report and that you are being presented as the person who is going to speak to it.

Have I got that part correct?

DR. GILLILAND: That's correct. Yes you do.

MR. SIMMONS: Okay. All right.

So can you start maybe about your own personal background and tell me what your background and experience is with hydroelectric projects?

DR. GILLILAND: I have very limited experience with hydro projects.

MR. SIMMONS: So limited – so what is your experience then?

DR. GILLILAND: I would – limited to, sort of, maintenance projects – little bits and pieces on existing dams and – such as fall protection arrangements and things like that – inside the powerhouses, and dealing with some restoration or repair types of projects.

MR. SIMMONS: Okay.

DR. GILLILAND: No new construction.

MR. SIMMONS: Okay.

Can you give me a little more detail then, about what those restoration and repair projects were so that we can understand the size and scope of the project and what your role and involvement was, please?

DR. GILLILAND: Well, these would have been on an existing dam project, so not during the original construction of them.

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: So it would be – in the example I gave you around fall protection – determining the fall protection requirements inside existing powerhouses that were built prior to safety regulations.

MR. SIMMONS: So fall protection is just for the workers who are working on the project –

DR. GILLILAND: That's –

MR. SIMMONS: – in the tie-offs

DR. GILLILAND: – in the inside.

MR. SIMMONS: – and that sort of thing.

DR. GILLILAND: Exactly.

MR. SIMMONS: Yeah. Okay. All right.

Any other examples – anything else that you've done in connection –

DR. GILLILAND: Yeah, so –

MR. SIMMONS: – with a hydroelectric power plant?

DR. GILLILAND: – so recently, we looked at a repair of cracked concrete on an existing building – on an existing dam structure in Manitoba –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – to determine the causes of – and the potential mitigation strategies to repair the cracks.

MR. SIMMONS: Okay. So that was an engineering investigation. Did that involve overseeing any construction work?

DR. GILLILAND: No. It did not.

MR. SIMMONS: Okay. Have you ever been involved in any kind of construction management for a hydroelectric project?

DR. GILLILAND: No. I have not.

MR. SIMMONS: How about estimating for a hydroelectric project?

DR. GILLILAND: No.

MR. SIMMONS: Risk assessment for a hydroelectric project?

DR. GILLILAND: No.

MR. SIMMONS: Right.

Engineering design for a hydroelectric project?

DR. GILLILAND: No.

MR. SIMMONS: Right.

We've been regarding the Lower Churchill Project, and I say that instead of Muskrat Falls Project because the Lower Churchill Project, as I think you're probably aware, is a much larger scope than just the Muskrat Falls power plant. It includes extensive transmission lines in Labrador and on the Island of Newfoundland and it includes other infrastructures such as the high-voltage direct current components that convert electricity from AC to DC, both in Labrador and in Newfoundland, and a range of other components like that.

So can you tell me if you've had any personal experience concerning the construction of transmission lines?

DR. GILLILAND: It'd be personally you mean?

MR. SIMMONS: Yes.

DR. GILLILAND: Again, very limited to isolated towers on occasion in Alberta. So from a transmission line perspective, again, very limited to very small projects.

MR. SIMMONS: Okay.

So isolated foundations on transmission lines, would that be repair?

DR. GILLILAND: On occasion repair, yes.

MR. SIMMONS: Yeah. Okay.

DR. GILLILAND: On occasion new towers in isolated locations where, yeah, it was not an extensive transmission system.

MR. SIMMONS: Right.

Okay, so no personal involvement in actually the new construction of a transmission line. You haven't had any?

DR. GILLILAND: Not one of this size, no.

MR. SIMMONS: Okay, any size?

DR. GILLILAND: Very small. As I said, very small minor projects including two or three towers.

MR. SIMMONS: Okay.

What about dealing with the high-voltage DC transmission? Have you had any previous involvement with that?

DR. GILLILAND: I have not.

MR. SIMMONS: Electro grounding stations or submarine cables, such as the one that crossed the Strait of Belle Isle, any previous exposure at all to anything like that?

DR. GILLILAND: No.

MR. SIMMONS: Okay.

Well, we've been here describing the Lower Churchill Project as a megaproject. And one definition we've heard, as probably a rule-of-thumb definition, is that anything over a billion dollars in value might be considered a megaproject. Another way perhaps to look at it is a project which is varied and complex, such as the overall Lower Churchill Project can be described to be.

So can you tell me what your personal experience has been on something that you would consider to be a megaproject?

DR. GILLILAND: From my own personal experience?

MR. SIMMONS: Yes, please.

DR. GILLILAND: The largest project that I've been involved with the new construction of would be the Confederation Bridge project which was over a billion dollars.

MR. SIMMONS: Okay.

And did you play any construction management role?

DR. GILLILAND: No.

MR. SIMMONS: Estimating or planning or scheduling role?

DR. GILLILAND: No, I did not.

MR. SIMMONS: I've heard you say that you were involved in some of the concrete engineering work?

DR. GILLILAND: Right.

MR. SIMMONS: Can you describe just what the extent of your involvement and role was with that, please?

DR. GILLILAND: Yeah, as part of my Ph.D. research I was involved with – and the people I was doing research with at the University of Calgary were – my supervisor for my Ph.D. was one of the original designers of the Confederation Bridge –

MR. SIMMONS: Okay.

DR. GILLILAND: – one of the original design team.

MR. SIMMONS: Right.

DR. GILLILAND: And there – so there were a variety of researchers and designers at the University of Calgary involved in the project.

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: So I was able to see how the construction process and then that's what I was tasked with evaluating how the concrete girders and foundations were constructed and the process involved with – and how that linked to the design of the bridge.

MR. SIMMONS: Right.

What was your Ph.D. focus? Normally in a Ph.D., it's a fairly narrow focus on some area. What was your Ph.D. work in?

DR. GILLILAND: Thermal and shrinkage effects in high performance concrete during construction.

MR. SIMMONS: Yeah. Right.

So your involvement in the Confederation Bridge, was it solely through your Ph.D. work? Or were you contracted or working for anyone, any party that was involved in the construction design of the bridge in any kind of commercial way?

DR. GILLILAND: Yeah as a team at the University of Calgary we were working to support the construction team.

MR. SIMMONS: Okay.

And that was contracted to whom. Who – which –

DR. GILLILAND: Strait Crossing.

MR. SIMMONS: Strait Crossing.

DR. GILLILAND: Right.

MR. SIMMONS: Okay.

And that was to do with the thermal expansion and – of the concrete as you've described?

DR. GILLILAND: Right.

Ensuring the construction process was appropriate –

MR. SIMMONS: Right.

DR. GILLILAND: – to ensure that the highest quality.

MR. SIMMONS: So that gave you some exposure to –

DR. GILLILAND: Mmm.

MR. SIMMONS: – to a megaproject.

DR. GILLILAND: Right.

MR. SIMMONS: Anything else that you would consider a megaproject that you've been involved in?

DR. GILLILAND: So in terms of complexity and size I would equate it with the – what's called the Calgary Courts Centre in downtown Calgary. It's a two-building high-rise connected with a full height atrium designed for progressive collapse security requirements from a structural engineering perspective. I don't know what the exact construction value of the project was –

MR. SIMMONS: Mmm.

DR. GILLILAND: – but it was over 300 million.

MR. SIMMONS: Okay.

DR. GILLILAND: It was a very complex project and required involvement right from the very beginning. From my perspective I was one of the engineers of record for that project –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – in the structural design.

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: And I was required to estimate quantities of steel and concrete –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – and formwork to determine how to, from a cost perspective, to ensure that we – it was made – it met the budget requirements.

MR. SIMMONS: Right.

So these were two high-rise buildings and from the review of your CV, am I correct that much of your work experience has been in building construction?

DR. GILLILAND: That's correct. With some bridges, but primarily focused on buildings, yes.

MR. SIMMONS: Okay. Okay.

And have you had any megaproject experience in any kind of industrial application? I know in Alberta, oil sands projects we consider megaprojects –

DR. GILLILAND: Right.

MR. SIMMONS: – I think. Construction of upgraders and those sorts of things, which are large-scale industrial projects with different facets to them and multiple contractors involved.

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: What experience, if any, have you had on projects like that?

DR. GILLILAND: We have been involved with – myself personally as well –

MR. SIMMONS: You personally.

DR. GILLILAND: Yeah. I've been involved with the buildings on these sites and maintenance garages, the pipeline supports as I said before. As part of an overall project, I have not – I was not part of the EPC teams that were overseeing the entire project, but I was involved in the process – the documentation process around – with these types of projects.

MR. SIMMONS: Okay. So had you – so you – I'm guessing you were working for contractors who were involved in those projects, were you?

DR. GILLILAND: Yes. I think primarily that's true. Sometimes it's – it was – it's a mix. Sometimes it was for the owners, sometimes it was through a contractor.

MR. SIMMONS: Right. Have you ever been involved in a project like that, in developing the approach to be taken to the project management?

DR. GILLILAND: In the initial – at the initial phases of those particular projects, we were part of the – and sometimes these are design-build types of projects where that would be one format that is – that gets predetermined by the time we are involved.

MR. SIMMONS: Right. So you wouldn't be involved in that?

DR. GILLILAND: On occasion we were able to participate, as I said, when we were working directly for the owner that –

MR. SIMMONS: Okay.

DR. GILLILAND: – we would decide or have some input on how the contracts would be structured.

MR. SIMMONS: Okay.

Mr. George's CV is at Exhibit P-02332. Now, I know he's not here to give evidence himself and you've described him as having experience, I think, in construction in the north. And I do see references to projects here in the Northwest Territories.

When I look through them, they appear to be – I'm going to describe them as quite small-scale projects compared to the Lower Churchill Project. Would that be correct?

DR. GILLILAND: That's correct, yes.

MR. SIMMONS: Things such as RCMP detachment buildings, you know, bulk fuel storage tanks, projects on that scale.

DR. GILLILAND: And – yes, primarily, and some would have been larger, although not of the size of the Churchill Falls Project –

MR. SIMMONS: Right.

DR. GILLILAND: – on industrial sites, like mine sites in particular.

MR. SIMMONS: So does Mr. George have any experience on hydroelectric projects whatsoever?

DR. GILLILAND: Similar to myself in terms of maintenance and operational types of issues after construction.

MR. SIMMONS: Okay.

And what about on what – the sorts of things we've described as megaprojects? Has he ever been part of a design team or a construction management team or a project manager for an owner or a major contractor on a megaproject?

DR. GILLILAND: Not on a megaproject.

MR. SIMMONS: Okay.

And you relied as well on the work from Ms. Porter, who's recently with your company. I've looked at her information that's provided in her bio at Exhibit P-02333, and my impression on reading it is that much of her work has been on water systems, sewer systems, geotechnical work in relation to those sorts of projects. Do I understand that correctly?

DR. GILLILAND: These are – kind – this is the – our standard Williams Engineering bio for Evelyn.

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: And it's – these – the projects you see listed here are primarily – I call them related to the primary business line for Williams Engineering.

MR. SIMMONS: Mm-hmm.

So what is the primary –

DR. GILLILAND: So her –

MR. SIMMONS: – business line of Williams Engineering?

DR. GILLILAND: Well, engineering design for –

MR. SIMMONS: Okay.

DR. GILLILAND: – and primarily we're focused on buildings in all sectors.

MR. SIMMONS: Okay. Yep.

DR. GILLILAND: Yeah.

MR. SIMMONS: So has Ms. Porter ever been involved in any aspect of a hydroelectric project?

DR. GILLILAND: No. She has not.

MR. SIMMONS: What about what we consider a megaproject?

DR. GILLILAND: Yes, I believe she has. She's been involved in a variety of, as I said, communication right-of-way routing. So, extensive transmission communication lines in – and mining sites and mining projects –

MR. SIMMONS: Okay.

DR. GILLILAND: – roads and highways of a large scale –

MR. SIMMONS: Right.

Has she ever played any kind –?

DR. GILLILAND: – pipelines and geotechnical studies.

MR. SIMMONS: So has she played technical roles there or has she ever played any kind of senior administrative or management role?

DR. GILLILAND: Primarily on the design side.

MR. SIMMONS: On the design side, okay.

And (inaudible) –

DR. GILLILAND: And the –

MR. SIMMONS: Sorry.

DR. GILLILAND: The oversight piece that goes with design is not – shouldn't be overlooked. As designers, we would play a role similar to SNC did as part of an integrated project team where we would be involved in the construction phase by monitor – through monitoring our designs to ensure that they are built according to our design requirements.

MR. SIMMONS: Okay.

And finally, Mr. Zaccaria. Now, I'm not certain, is Mr. Zaccaria an engineer?

DR. GILLILAND: No, he's not.

MR. SIMMONS: Okay.

And in looking through his project experiences described in Exhibit 02334, I see – did he work for ATCO Structures involved in setting up work camps and those sorts of things?

DR. GILLILAND: No. He was employed with Williams Engineering –

MR. SIMMONS: I see.

DR. GILLILAND: – at that time, acting as a primer – a prime consultant from – in an engineering role.

MR. SIMMONS: And, again, I see his involvement in things such as fuel storage facilities, like maybe Petro-Canada Petro-Pass stations, warehouses, government buildings. Has he had any direct experience in any kind of hydroelectric or electric transmission projects?

DR. GILLILAND: No, he has not.

MR. SIMMONS: And what about on anything we consider a megaproject?

DR. GILLILAND: Experience, I guess, things like ATCO Structure's Jackpine oil sands site, again –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – dealing primarily –

MR. SIMMONS: (Inaudible) camps.

DR. GILLILAND: – with the camp. Yeah.

MR. SIMMONS: With the construction camps.

DR. GILLILAND: Yeah.

MR. SIMMONS: Okay. All right. And you were referred by Ms. O'Brien to page 3 of your report, which is P-01678, so maybe we can bring that up, please, Madam Clerk? And it's – oh, I'm sorry – I don't have the –

THE. COMMISSIONER: Page 4.

MR. SIMMONS: Yes. That's it there. Thank you.

That's probably PDF page 4. So these are the – these nine areas are the ones that I think Grant Thornton asked you to provide comment on. And I understand now that these comment on these are the collective work of yourself and the other people that are identified there. So just to confirm, have you or anyone else on your team ever played a role in forecasting and budgeting for either a hydroelectric project or a significant megaproject?

DR. GILLILAND: Not for a new hydroelectric project, no. But for other megaproject sizes, the – so Evelyn would have had involvement in that with her studies at – and involvement in the projects that I mentioned to you earlier.

MR. SIMMONS: All right. For geotechnical work?

DR. GILLILAND: She was involved in the geotechnical –

MR. SIMMONS: Yeah.

DR. GILLILAND: – environmental side of it. Yes.

MR. SIMMONS: Okay. Item 2 is temporary enclosure, which refers to what we call the ICS.

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: What involvement have you or anyone on your team had in a large-scale temporary enclosure such as the one that was planned for the Muskrat Falls site?

DR. GILLILAND: Temporary enclosures are a very common construction strategy, especially in the North. So we have not had involvement in an enclosure of this size, but we're quite comfortable reviewing and understanding the principles behind the use of enclosure structures, especially in the North.

MR. SIMMONS: What's the largest structure that you or your team were involved in in the North?

DR. GILLILAND: Oh, enclosure structure?

MR. SIMMONS: Yes. Temporary enclosure structure.

DR. GILLILAND: The largest one. I'm not sure –

MR. SIMMONS: A significant one.

DR. GILLILAND: – if I could think of it.

MR. SIMMONS: Give me an example of a significant one.

DR. GILLILAND: Well, mine – I'm just scrambling to try to –

MR. SIMMONS: Yes.

DR. GILLILAND: – pick – find the biggest one in my mind here.

MR. SIMMONS: Yeah.

DR. GILLILAND: So the power – a power generation facility at a mine site where the – where large turbines are mounted inside a building, that would be the – probably the largest individual foundation. These are very large turbines.

MR. SIMMONS: (Inaudible.)

DR. GILLILAND: For power generation.

MR. SIMMONS: I'm assuming these are diesel generators, are they?

DR. GILLILAND: Correct, yes.

MR. SIMMONS: Diesel generators (inaudible) –

DR. GILLILAND: Yes.

MR. SIMMONS: Okay.

DR. GILLILAND: Yeah.

MR. SIMMONS: And so I understand, were you a designer? Or what role did you play for the temporary structure that was used for that – for the construction of that facility?

DR. GILLILAND: We didn't design the temporary structure. That would be the contractor. We would – we were – in the project I'm thinking of specifically, we were the prime consultant design team –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – that was responsible for the whole building.

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: And the – and overseeing the construction of it.

MR. SIMMONS: Okay.

DR. GILLILAND: It's a temporary means and methods, sort of contractor-driven type of process.

MR. SIMMONS: Okay. And if we look down through the list there, items 3 to 9, I can go through the same questions. For those items that are listed there, those topics, have you or your team been involved in – on any of those topics on a hydroelectric project or a significant megaproject?

DR. GILLILAND: Not on a – I'm trying to think of a megaproject. I think – the point I would make is that the principles involved from an engineering perspective are largely common, regardless of whether it's –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – over a billion dollars or less than a billion dollars. Considering construction, calculating construction costs, on these things – on these types of projects, for example – whether large or small – you still have to go through the same process.

So to answer specifically your question around megaprojects –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – some input – not on – is there anybody on my team? So Evelyn would have been involved on the pipelines and the transmissions and the coming up with estimates early on – early estimates – and then seeing those estimates through the construction is the – sorry, through the design as well as the construction phase and ensuring that the risks and the factors involved in the original estimates were considered through the course of – through the design process as well as into construction.

MR. SIMMONS: So would it be fair for me then to describe your involvement and your team's involvement in doing this work as, although never involved in a project of this nature or scope, you've extrapolated from your experience with smaller scale projects to provide the opinions that have been provided here?

DR. GILLILAND: I'm not sure if extrapolation is the right word.

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: In terms of the size of the project, the dollar values involved would be larger, but the processes and the calculations and the use of things like productivity factors is the same.

MR. SIMMONS: Okay. Okay.

All right. Thank you, Dr. Gilliland.

Commissioner, after other counsel have asked any questions I might just speak for a moment to the question of the opinions to be provided by this witness.

THE COMMISSIONER: Sure.

All right. Concerned Citizens Coalition?

MR. BUDDEN: Nothing.

THE COMMISSIONER: Thank you.

Edmund Martin?

MR. SMITH: No questions.

THE COMMISSIONER: Kathy Dunderdale?

MS. E. BEST: No questions, Commissioner.

THE COMMISSIONER: Former Provincial Government Officials?

MR. T. WILLIAMS: No questions, Mr. Commissioner.

THE COMMISSIONER: Julia Mullaley, Charles Bown?

MR. FITZGERALD: No questions, thank you.

THE COMMISSIONER: Robert Thompson?

MR. COFFEY: No questions.

THE COMMISSIONER: Okay.

Consumer Advocate?

MR. PEDDIGREW: No questions, Commissioner.

THE COMMISSIONER: Innu Nation, I don't think are here.

Emera Inc.? Not here.

Astaldi Canada?

MR. BURGESS: No questions, Commissioner.

THE COMMISSIONER: Former Nalcor Board Members? Not here.

Newfoundland and Labrador Building Construction Trades Council, Resource Development Trades Council? Not present either.

Dwight Ball, Siobhan Coady? Not present.

ANDRITZ Hydro Canada?

Grid Solutions ULC?

Barnard-Pennecon?

All right, submissions, Ms. O'Brien.

MS. O'BRIEN: Thank you, Commissioner. So this is a little bit of an unusual procedure for those of us who are used to normal court procedures. Mr. – the report of Williams Engineering has already gone in. This was – Williams Engineering was retained by Grant Thornton to support their work. So I would just – my ask is just to proceed with questioning Mr. Gilliland on the opinions expressed in that report. Thank you.

THE COMMISSIONER: Okay. Mr. Simmons?

MR. SIMMONS: Thank you, Commissioner.

We don't object to having Mr. Gilliland proceed to present his evidence and to speak to the report that has already been filed. I just caution that, although this is an Inquiry – the rules are very different than in court, and particularly those dealing with the standard of evidence to be presented – that were this in a trial in court, I'd suggest it is questionable whether Dr. Gilliland would be qualified to give the full extent of expert opinion that's contained in the report so that consequently some caution should be applied, I expect, to the evidence that we'll hear.

THE COMMISSIONER: Thank you.

I think the way I would basically look at this is that as the witness has indicated, he isn't – he states that the principles involved – while he may not have been working on a hydroelectric project – or the individuals who were working on this particular project – the principles involved are the same from an engineering perspective. So whether in court or, alternatively, whether here in an inquiry, I think I would be leaning towards the admission of opinion evidence with regards to this because I do think it would be helpful to a trier or (inaudible) or alternatively even for me as a Commissioner.

It's always a question of weight, with regards to weighing opinion evidence, and it will continue to be a question of weight as I hear the evidence in this particular Inquiry. So go ahead. I will allow Mr. Gilliland to speak to the – to provide opinion evidence with regards to the items that are referred to in his report. As requested on the

basis of his engineering experience and that of his collaborators with regard to the report.

MS. O'BRIEN: Thank you, Commissioner.

All right, Dr. Gilliland, I just touched on it a couple of minutes ago, but I'd like you to give us a little more detail on how you came to be – or Williams Engineering – came to be engaged to prepare this report?

DR. GILLILAND: Certainly.

Grant Thornton contacted us prior to the – after the request to complete the Inquiry and approached us based on our northern presence in northern Canada and our experience in Arctic construction – or northern construction. And based on that, they – and our discussions, we decided that we would review the nine items that Grant Thornton had questions about. And so we provided this report as part of that.

MS. O'BRIEN: Okay, thank you.

And those nine items are the ones that we just briefly reviewed there on page 4 of the report. So am I to understand from that it was Grant Thornton that identified those nine areas that they were seeking your input on?

DR. GILLILAND: That's correct.

MS. O'BRIEN: Okay.

And in terms of the documents that you reviewed in order to prepare the report, you provided us with a list that we've included as Exhibit P-02330, it's at tab 2 of your binder. So am I to understand that this was – this is a multi-page document, but this is a complete list of the documents that Grant Thornton provided you that you and your team reviewed in the preparation of the report?

DR. GILLILAND: That's correct, yes. Grant Thornton provided these documents to us. We're aware that this is a select list. Grant Thornton selected these documents to provide to us because they thought they were particularly relevant to the nine topics of – that we were asked to consider.

Through the course of that initial – on several occasions, I should say, we did ask several questions, and based on those questions they provided additional documentation to us which is also listed as part of this list.

MS. O'BRIEN: Okay.

So was Grant Thornton initially – that they decided what they thought would be relevant to your work, they provided you those documents. If you went back to them looking for more information, in some cases, they provided additional documents to you?

DR. GILLILAND: That's correct.

MS. O'BRIEN: Okay, thank you.

Does that place any limitations on your findings? Obviously, you didn't review – you didn't have full access to all the documents that the Commission had available from Nalcor and other entities.

DR. GILLILAND: It does. Some – I would expect that on some issues that we would have some of the information but not all of the information. So we were able to make comments based on that. Sometimes general, in terms of attempting to articulate the variables involved or the considerations that would be involved from an engineering perspective in those questions. But we didn't – we're aware that we did not have all of the information around that topic that's – all the documents.

MS. O'BRIEN: Okay.

So if other relevant documents or information came to light that you were not aware of at the time of writing your report, would it be fair to say would – could that have any effect on your opinions?

DR. GILLILAND: It could, yes.

MS. O'BRIEN: Okay.

DR. GILLILAND: Yeah.

MS. O'BRIEN: And I do believe this is in – stated in your report. If we could just briefly go

to page 39 of the report, Madam Clerk, so that's P-01678.

DR. GILLILAND: It's the last page of the report, which has a closure statement indicating that if additional information comes to light that we would reserve the opportunity to review the additional new information.

MS. O'BRIEN: Okay, thank you.

So I'm now going to address each of the nine areas of your report in turn. The way the report is structured, on the early pages of the report – pages – excuse me – pages 4, 5, 6, up to page 9, there's an overview of each of the nine areas with your main finding under each of those nine areas listed.

DR. GILLILAND: Right. That's correct.

MS. O'BRIEN: And then in the rest of the report you get into each area in a bit more detail.

DR. GILLILAND: That's right.

MS. O'BRIEN: Okay.

So the first section is forecasting and budgeting. And the summary – I'll get you to start here on the summary pages, so pages 4 and 5 of the report. So we'll go to page 4 and 5.

Here, your conclusions are set out, actually, even moving on to subsequent pages. Can you give us a review of what your most significant findings on this section – what they were?

DR. GILLILAND: Certainly.

From a forecasting and budgeting perspective, we noticed that the risk factors – some of the risk factors identified early on were not included as part of the contingency. It is – you know, it's best practice to look at these – all of the factors and all the risks identified in the early stages of an estimate and assign values for cost and schedule impacts to those risks and then include them as part of the project estimate.

So it is – so that – and then on an ongoing basis, of course, these – the contingency and then the budgets need to be updated on a regular basis as new factors or risks come to light or a new scope is added or changes to the contracts impacting cost and construction schedule as they occur, that the budgets would be updated and schedules would be updated to reflect the current conditions.

MS. O'BRIEN: Okay.

You talk – you just used the word best practice. We've had, I think, a fair bit of evidence already to date about what, you know, best practice is. Can you give the Commissioner, please, your description of what you consider to be a best practice or what you draw on to determine what a best practice is?

DR. GILLILAND: It's really – I guess, best practice can be described as a process or procedure that is commonly followed to address a particular issue or concern or a way of achieving a particular outcome, one that is commonly used.

On most projects – and certainly on this project – there were some innovative and new ideas, new evolutions of processes such as Monte Carlo that were brought to bear on this project and that – at that – especially at this particular time when the project was being designed and conceptualized, Monte Carlo was a relatively new and, I would call it, state-of-the-art process or evaluation tool to estimate cost and schedule and the risk – and assess their impacts of risks on those – on the construction project.

So, best practice includes things that are common, as well as the latest improvements, as well as new ideas that can be brought to bear to improve to the best – in the best way possible, the outcomes.

MS. O'BRIEN: Okay.

So would it be fair to say then that best practices evolve and change over time?

DR. GILLILAND: They do. They do evolve, certainly, with technology and new ideas, yes.

MS. O'BRIEN: Okay.

So maybe we'll go to the sections of the report where you get into this topic in a little more detail and that's starting on – it starts on page

10. I'm going to take you to page 11 initially, though.

UNIDENTIFIED FEMALE SPEAKER: (Inaudible.)

MS. O'BRIEN: Thank you.

So you just talked a bit about how one of your findings – and as I understood it that you're saying it's what is – it is important or good practice to identify all risks associated with a project, account for those risks in your cost and schedule estimates, and then throughout the life of the project revisit those risks and do a continual assessment in the cost and schedule outlooks. Is that –

DR. GILLILAND: That's correct.

MS. O'BRIEN: – a fair summary? Okay.

So, now, in – on page 11 you do some discussion between allowances versus contingency. So I'm just going to point to the second full paragraph on page 11 with the – it's the paragraph that starts with: Scope definition and documentation of the scope, but it's – I'm going to start halfway through that paragraph.

It says: "In this situation, best practice is to assign an allowance in the budget and schedule for this scope of work. Because the scope is not clearly defined, a contingency is estimated for factors that have not yet been identified, and this contingency is added to the allowance."

So you're using two words here to assess I would say ultimate unknown – things that have an unknown ultimate impact to the project allowance and contingency.

Can you please explain for us how you use those two terms and how you differentiate between them?

DR. GILLILAND: Certainly.

The – I mean, especially in the early stages of a project, the exact scope definition and work plans are not clearly established but just like on this project, risk registers and discussions around scope and risks that may occur on a project or requirements, things that experts at that time or people involved with the project realize will be necessary, and factors that might impact the construction. All of these things are brainstormed and people try to establish the greatest understanding of the project in the early stages of a project.

At that time, we don't – there are no construction documents available in the very early stages, so you have to use things like dollars per square foot or estimates based on previous experience and come up with estimates of cost and schedule, a requirement – duration of construction for the project. At that point, you're really looking at making an allowance for a particular item. So based on experience, you assume or you estimate that a certain amount of concrete or a certain amount of reinforcing steel would be required and it would take a certain period of time to complete that work.

At the early stages, there's – that's an allowance. Now when you're thinking – so an allowance would cover the things that people have already thought about. So the design team has identified a risk or identified a factor involved in a project, and that's what I would consider to be an allowance.

A contingency would be added on top of an allowance because a contingency is intended to be used for things that no one has thought of yet, things that have yet to materialize or yet to occur but would likely would occur. On any project, there are always things that are unforeseen or unknown or something unexpected occurs and you have to have a contingency to address – to allow resources to be brought to bear to those unknown factors.

MS. O'BRIEN: Okay.

So if I'm understanding you correctly, so when you have it – so let's take maybe a concrete, you know, an actual example. So if you were designing the power – the transmission line and you know you're going to – you know you don't have full details of what all the geotechnical information is along the entire line, you're gonna be making an estimate of the types of tower foundations that you're gonna need.

DR. GILLILAND: Right.

MS. O'BRIEN: You may not be right in that estimate. You know early on it's only an estimate, so you might not be right. Additional money added to the budget at that point, would you consider that an allowance? To cover the unknown of what you're actually gonna meet on the ground? Or would that be a contingency?

DR. GILLILAND: That would be a contingency.

MS. O'BRIEN: That would be a contingency. Okay.

DR. GILLILAND: Right.

MS. O'BRIEN: So contingencies are for things – for risks that you can identify –

DR. GILLILAND: No, that you can – that you have not identified.

MS. O'BRIEN: Okay.

DR. GILLILAND: But it is – it's an unknown factor that would materialize later. On any project, things happen that you haven't – that you didn't think about initially.

MS. O'BRIEN: Okay.

Would that also include things you've thought about initially but you didn't know what the impact would be?

DR. GILLILAND: You would – I – you would normally make an allowance of cost and schedule. If you've thought of whatever it might be, for instance, the type of soil conditions at a – just to carry on with your example – soil conditions at a tower location, you would assess the variability, anticipated variability of those – of the soil conditions, and you would assign, based on experience, a value that would – for cost as well as schedule to complete those foundations, based on what you do know and experience and the factors that may or may not occur. The contingency is added on top of that.

MS. O'BRIEN: Okay. All right.

So we've had evidence that Nalcor divided its risks into two groups, tactical risks and strategic risks. And tactical risks, as we've heard from people in Nalcor, they would be risks that were deemed to be within the control of the project management team, whereas strategic risks were things that were not – outside the control of the project management team, such as political risks, enterprise level risks, things that could ultimately have some impact on the project.

When you refer to risk in your report and in your testimony today, are you referring to tactical risks, strategic risks? Or do you treat them both the same?

DR. GILLILAND: No, I would say we're dealing – this report deals primarily with the tactical risk components.

MS. O'BRIEN: Okay. All right.

Now, you do say: It's best practice to include the potential costs and schedule impacts of risks in the overall project costs and schedule reporting.

So there you're talking about tactical risks?

DR. GILLILAND: Correct, yes.

MS. O'BRIEN: Okay.

How would – in terms of your understanding of best practice, how would strategic risks be dealt with?

DR. GILLILAND: Well, outside of the project, as part of the ownership, the owner's team would be involved in that sort of thing. I'm not – I don't have a lot of experience dealing with the strategic risk elements.

MS. O'BRIEN: Okay.

So when – your experience is dealing with project budgets themselves?

DR. GILLILAND: Correct.

MS. O'BRIEN: And so, am I understanding you correctly, like what was done in this case, the Muskrat Falls Project, in the project budget itself, you would expect to see contingency for the tactical risks only.

DR. GILLILAND: Right.

MS. O'BRIEN: Okay.

Now at section 2.2 of your report, which starts at the bottom of page 11, you talk about the Monte Carlo simulation, and you do note here that using the Monte Carlo simulation represented best practice and state of the art in assessing multivariable cost and schedule outcomes for large construction projects.

So can you just – have you worked with the Monte Carlo simulations before?

DR. GILLILAND: I have worked with the – I had worked with it as part of my PhD research, as in terms of predicting the cracking of concrete based on parameters that I looked at as part of my research.

MS. O'BRIEN: Okay.

And so I understand Monte Carlo analysis, although in this hearing room, we've been talking about it really with respect to forecasting project cost, project schedule. I understand this is a statistical tool that has many broad applications throughout the world of engineering and even beyond.

DR. GILLILAND: Right. Exactly, yes.

MS. O'BRIEN: All right.

But are the principals the same in all –?

DR. GILLILAND: It's the same analysis tool and you're – simply set different – it's a process of connecting variables and assigning values to input variables and ultimately creating – it's a random probabilistic analysis of probable outcomes –

MS. O'BRIEN: Okay.

DR. GILLILAND: – based on equations and input from the beginning and output from the end.

MS. O'BRIEN: Okay.

So you do note here it was best practice and state of the art in assessing cost and schedule outcomes. So have you or other members of your team – I guess I should be asking, what led you to that conclusion, that this is a best practice and state of the art?

DR. GILLILAND: This was a – the tool was used in, you know, in 2000's and it was relatively new in those days just because of the computer horsepower required to use the program. To use that methodology of probabilistic analysis requires a lot of computer horsepower. And so, it wasn't until the 2000's and onwards that it was even possible to apply these – this technique.

MS. O'BRIEN: In construction projects?

DR. GILLILAND: In construction projects.

MS. O'BRIEN: Okay.

And so have you worked on other projects where Monte Carlo simulation was used to do forecasting of cost and schedule, you or other members of the team?

DR. GILLILAND: No, I don't think so.

MS. O'BRIEN: Okay. All right.

So you do go on and put a caveat there with the analysis tool there. You write: "As with any analysis tool, however, the quality of the information generated by the tool is directly proportional to the accuracy and detail of the data put into the tool."

Can you give us a little bit of an explanation on this qualifier or caveat that you have in your report?

DR. GILLILAND: The Monte Carlo simulation is a – it's a – it uses a random probabilistic generation of outcomes. So it guesses based on probability distributions of input variables and uses a series of equations that are created by the users to calculate an outcome based on the input parameters.

So if the accuracy of the data is – you need to have accurate data and with an accurate reliability that goes with that data, that's input into the calculations and the equations and also understanding of the – the correct understanding of the relationship between different variables.

So an example would be the impact of schedule slip on a critical path item and what the impact of that would be on a subsequent step in – on a critical path. So if those relationships are clearly defined and understood, then the program will be able to provide the probable outcomes for that scenario. But if the relationship is not defined correctly or not included, then the outcome would not be correct.

MS. O'BRIEN: Okay.

And – so we do know that Nalcor used this tool. Did you – and I understand you would have seen the QRA results, the results of that analysis that was done, that they did at DG2 and DG3.

You're expressing in your report that it's important that obviously you have the right data inputs, you have the right relationships inputted into the simulation in order to get, you know, value from the results. Do you – you've said that. It makes sense. Did you look to see whether or not Nalcor did that in their use of the Monte Carlo tool or not?

DR. GILLILAND: We didn't look at the details of the analysis and the distributions and reliability attached with the variables that they were using.

MS. O'BRIEN: Okay. So you're just pointing this out as something that it's important to do in order to get results that are reliable.

DR. GILLILAND: Correct, yes.

MS. O'BRIEN: Okay.

You also point out in page 12 – looking at the last paragraph in your section on Monte Carlo analysis – the last sentence there, you talk about confidence ranges: "Hence, the confidence range (expressed as probability of achieving an outcome) of this outcome must also be reported to put the result into context. Without knowing the confidence range, a reported outcome is meaningless."

So I wanted to get you to give us a little bit more on what – the point you're making here in your report, and I understand it may helpful, for us to do this, to bring up one of the slides from Nalcor's QRA.

Madam Clerk, can you please bring up Exhibit P-00130, which is the DG3 QRA exhibit; Commissioner, you would have seen that a number of times, certainly in Phase 1. And if we could go to page 272 of this report. And this is, again, a slide that has been looked at previously, here in the hearing room.

This is one of the pages – one of the slides created by Westney Consulting Group but it shows the QRA analysis. Maybe you can make it just a little bit bigger there, Madam Clerk. And when you're talking about range Dr. Gilliland, using this, can you tell us what you mean?

DR. GILLILAND: So when a value of – from a Monte Carlo simulation is reported, and let's use the P50 number, it's – so if that is just a number stated unto itself $5.841 million – five thousand, rather, 841 million dollars – that's just a number. So if you report also that that is the P50 number, what that number represents is the value of construction that the outcome, the final construction for the project will either exceed – will exceed that value 50 per cent of the time.

So P50 numbers – so in all of the simulations run by the project – by the program, rather, by the simulation, 50 per cent of the time the actual predicted construction cost would be higher than that number. So that's useful as well, but 50 per cent of the numbers will be higher, so the question then becomes a question of reliability and accuracy around the range.

So 50 per cent of the numbers are going to be higher, so how much higher are they going to be? So then you have to get a full understanding of the meaning of this and the reliability of this number, you have to understand the range of predicted values within a certain probability range.

So in this case, there's a range stated from P25 to P75 and with a P50 – so 25 – sorry, for 75 per cent of the time, the numbers will be greater – the project is estimated to cost more than 500 – $5,489 million and 75 per cent of the time it'll be less than $6,227 million. So that is the range of – that is – that's kind of the expected range of the construction outcome.

MS. O'BRIEN: Okay.

So I think I –

DR. GILLILAND: So – yeah.

MS. O'BRIEN: Okay. Go ahead

DR. GILLILAND: So it could – but I guess in a different circumstance, if you didn't understand the range, the range could be 10 – the P75 number could be 10 billion or larger and then it becomes – you can put the number in context where $5.841 million as a P50 number, well it's a relatively tight range of expected outcomes, or 'oh my goodness the range of potential outcomes is very large' and so the construction costs could vary widely and so the data and the outcome are leading – are not very accurate.

MS. O'BRIEN: Okay.

So if I'm just – I'm gonna –

DR. GILLILAND: Or precise, sorry. Precise is the right word.

MS. O'BRIEN: I'm going to put that information back to you, just to ensure I have a clear understanding of it.

So what I believe you're saying is if you just say to someone the P50 value for the outcome of this project is $5.8 billion that – if you just give them that information, or you just give them the information that to achieve a P50 value the contingency would be $368 million. That is helpful information for someone but unless they know the range that the Monte Carlo simulation expressed, the P50 information is of limited value. And it would be of much greater value to someone to know not only what the P50 value is but also what the P25 to P75 values are or some other range, you know, P10 to P90 whatever it is –

DR. GILLILAND: Right.

MS. O'BRIEN: – so they can get some idea of the spread of the numbers. Because you could have the same P50 number and your P75 number could be $6 billion or it could be $10 billion.

DR. GILLILAND: Correct, yes.

MS. O'BRIEN: Okay.

All right. Thank you.

The next section of your report really addresses – and again, we're still in the Forecasting and Budgeting section but you've talked about the Nalcor project controls plan and I'm at page 12 of your report. I believe there's a couple of typos here in the heading you just wanted to point out?

DR. GILLILAND: Right.

The Nalcor number is missing a one. It's 18138 and that's – the actual document name is Project Control Management Plan.

MS. O'BRIEN: Thank you.

And that has been entered into evidence as Exhibit P-02335 at tab 7 of the binder before you.

So can I get you just to summarize what your conclusions are in this section of your report; and I know you talk about bottom-up estimating versus top-down estimating.

DR. GILLILAND: So the person's outlining the management plan, outlines different classes of estimate and different ways of calculating the cost and schedule. The initial phases of a project – so a class 5 is the early days, early stages of a project – it's largely based on what I define as a top-down calculation. So it's based on identifying parameters, elements of scope in a general sense and assigning general budgets and schedule requirements for that element –

MS. O'BRIEN: I'm just going to interrupt you here because it may be helpful to go to that exhibit please, Madam Clerk, and bring up page 40, 49 that would help I believe, P-02335, and if you go to, I believe, page 48.

Sorry to interrupt you Dr. Gilliland but I believe –

DR. GILLILAND: No, that's okay.

MS. O'BRIEN: –this may –

DR. GILLILAND: yeah. It's useful. So –

MS. O'BRIEN: – is the section of the –

DR. GILLILAND: That's right.

MS. O'BRIEN: – document that you're referring to so that may be of assistance. Please go on.

DR. GILLILAND: Scroll up to the top of the page. There we go, that's the part I – we're talking about right now – that I'm talking about right now.

MS. O'BRIEN: Okay.

DR. GILLILAND: So the class 5 estimate is largely a top-down type of estimate where as I said the parameters, factors, scope, items are identified, and budgets and schedule requirements are attached to those elements based on experience and previous projects and the accuracy is not as precise at that point because very few details are actually known, on which to base a detailed estimate.

So over a period of time through the course of design and project investigation and site evaluations, more information is collected, construction documents start being prepared and the level of detail is improved to the point where, in a class 1 estimate, the construction cost and schedule is determined based almost entirely on a construction – the construction documents.

So, looking at the documents you calculate the rebar, you calculate the concrete, the reinforcing – the formwork rather – and all the other elements that are included in the project, like the turbines or the excavation or the transmission towers. And, so, when you're doing it on that basis that's what I would call a bottom-up type of estimate.

And somewhere in between the class 5 and the class 1 estimate, the process of calculating a project budget and schedule transitions from one to the other. So in early days it's top-down and then at tender stage, it's based almost entirely from the bottom up. And through that change from class 4, 3, 2, 1 – 3 and 2 – the general parameters and the scope items are identified early on, are quantified and detailed very carefully in the construction documents.

MS. O'BRIEN: So the top-down – sorry to interrupt – but the top-down you're talking about, these are the green bars and the bottom-up are the red bars.

DR. GILLILAND: Right.

MS. O'BRIEN: So at – over time we can see the red bars increasing and the green bars decreasing.

DR. GILLILAND: That's exactly right.

MS. O'BRIEN: Okay.

DR. GILLILAND: So it's like – it's a conceptual – yeah, representation of what I'm describing.

MS. O'BRIEN: Okay.

And on page 13 of your report, you are talking about this model, and you say, "The adopted maturity model indicates that the level of completeness required for the DG3 sanctioning milestone is a Class 3 estimate based on 10-25% engineering completed, requiring a 10-15% contingency. At the DG3 milestone for the Muskrat Falls project, a contingency of 7% was used, which corresponds to a level of 80-100% engineering design completeness and does not align with expectations of the Nalcor controls plan."

So that's there in your report.

Are you aware of how much engineering design was completed at DG3?

DR. GILLILAND: I understand now that the level of engineering drawings was considered to be 40 or 45 per cent –

MS. O'BRIEN: Yes.

DR. GILLILAND: – complete. In that range.

MS. O'BRIEN: That would be based on information when you and I were speaking yesterday.

DR. GILLILAND: Right.

MS. O'BRIEN: Okay. So you didn't have that information at the time you wrote this report?

DR. GILLILAND: Not specifically, no.

MS. O'BRIEN: Okay. And I understand the evidence is somewhere between 45 to 50 per cent. I may not have that number precisely, but it's in that range, shall we say. I think it's different for different components.

But assuming it was around that range, 45 to 50 per cent complete, would that change the opinion that you expressed in the report here in terms of the amount of contingency that you would expect to see be included in the budget?

DR. GILLILAND: It's – I think it's very contextual and it's not immediately clear as to what I think the appropriate contingency would be. And the reason I say that is because it's very important to track –from the early – from the class 5 estimate, and as it becomes more precise – it's very important to track variables and risks through the course of the project that would be – that need to be considered or mitigated. And it is not clear to me that all of those risks items were included in the contingency at that stage.

MS. O'BRIEN: Okay. So from your review it's not clear that there was – I just want to make sure I'm understanding – not clear that it – difficult to say what a precise amount of contingency would be. Based on your review, it's not clear that all the risks were considered, which would mean that the contingency may be too low if not all the risks were considered?

DR. GILLILAND: Right.

MS. O'BRIEN: Okay. Page 14 of your report. I have one that's right here in the second paragraph here. I'd just like to give you – get you to give a little more information on this.

"Contingency and escalation allowances are tied to specific scopes of work so the rate at which the contingency and escalation allowances are consumed cannot exceed the rate of project progress. The final forecast cost is not a fixed value based on budget."

Can you explain – here you're talking about the rate of consumption. Can you give us a little bit more detail on what you mean here?

DR. GILLILAND: Yes, the – so contingency is attached – contingency is a percentage for – assigned to address unknown factors that have – that may or may not occur during the course of construction. And so for each component or scope of work, there is a contingency value attached to that item. And so you can't consume the contingency for a future scope of work to satisfy the requirements of an earlier scope of work without making some sort of allowance or change to the budget or the financial arrangements for the project because you're effectively consuming a contingency that was intended to last for the entire duration of the project.

MS. O'BRIEN: Okay.

So if you do end up – so I'm going to call it – sometimes it's referred to as a burn rate or the consumption rate of a contingency. So if you get into a situation – and we do have some evidence – I'm putting this to you because we do have some evidence that that's what occurred on the Muskrat Falls Project – that the tactical contingency that had been set aside had been essentially consumed early in the first year of the project, early in 2013, really before a lot of the construction had gotten started. If that happens, then I would take it that would be an example of your consumption rate of contingency being much faster than your progress rate of construction.

DR. GILLILAND: Right.

MS. O'BRIEN: Okay.

So in that case what – in your opinion, what is – what would be the – what steps should you take if you find yourself in that situation?

DR. GILLILAND: You'd need to – or, you know, if the contingency is consumed in the early stages of a project, there still needs to be a contingency assigned for later stages of construction. It's not possible to go through the duration of the project without having unforeseen items come forward. So the situation, if – when a contingency is consumed, it needs to

be reassessed at that point to understand if there's trends or what is happening, if something significant has been missed or the reasons – ultimately, the reasons why the contingency has been consumed.

MS. O'BRIEN: Okay, thank you.

A little further down, on the last section of this page you're talking about the deviation alert notice. We've had some evidence already about Nalcor's change management process and how they had deviation alert notices, project change notices, change orders, these various documentations that were created along the way when there was changes to the project of any type. One of the questions I want to put here, you are referring here to the Project Controls Management Plan. And you do state here in this paragraph that: "The information required for a DAN is not clearly described in the plan, but" – it – "should include an estimated cost and schedule impact in order to highlight the potential significance and importance of the DAN."

And your last sentence here says: "Given the importance of change management, it would be expected that a detailed process, outlining detailed procedures and information that must be provided, is created as part of the project planning process."

So, I know you didn't have access to the full documents that we had. There was – there are other documents that I'm aware of at least. The – one has already been entered in evidence is P-01940; it's the project Change Management Plan. I didn't see that on your list of documents that you received from Grant Thornton.

DR. GILLILAND: Right.

MS. O'BRIEN: Did you see or review that document?

DR. GILLILAND: No, I didn't see that document.

MS. O'BRIEN: Okay.

DR. GILLILAND: So this is – this paragraph here is related just as – it's a statement of the importance of this portion of the change management process but not knowing what had been sort of been documented at that point and how – what had sort of happened.

MS. O'BRIEN: Okay, so there may be other –

DR. GILLILAND: There could very well.

MS. O'BRIEN: – documents relevant to this process that you haven't seen.

DR. GILLILAND: Correct, yes.

MS. O'BRIEN: Okay. Thank you.

The next section of your report you – again, we're in still in forecasting and budgeting – you address is the DG3 Basis of Estimate document. Commissioner, that has been referred to previously in the evidence. It's actually been entered twice: P-00094 and P-00133 are duplicate exhibits.

I just wanted to talk to you a little bit about what – your conclusions here. You – in the first paragraph you talk a bit about the change from the EPCM to the integrated management team or that – you know, that the – you note that the basis of estimate was developed using the EPCM contract structure, but that was not ultimately the structure used. And we've had evidence of that already.

How does the change from EPCM to an integrated management team – are you saying that that affects the basis of estimate document or not?

DR. GILLILAND: The change in delivery method really impacts the – potentially could impact the way in which the risks are tracked and documented and treated as part of the budget and schedule. So that was a concern raised that we – that was raised in our report, but it's not necessarily that it wasn't – I guess it's a statement of concern as opposed to a criticism or issue.

MS. O'BRIEN: Because you – is that because you don't have all –

DR. GILLILAND: Because we don't have it.

MS. O'BRIEN: – the details of what was done?

DR. GILLILAND: We don't have all the details in terms of how the risks were tracked and added and incorporated into the process.

MS. O'BRIEN: Okay.

And likewise on page 15 you have a number of bullets here that address – you're talking again about the top-down bottom-up method and the transition between the two as time goes. You've – you talk about, you know, the – a number of concerns that are addressed in this process.

They're here and they speak for themselves, but the question I have for you, when you are raising these concerns here, is this just simply to say, like, these are things you have to look out for or be aware of? Or are you suggesting here that Nalcor did not take due consideration of these concerns? Or is it something you just don't know whether they did or they didn't?

DR. GILLILAND: These are just – because we didn't have all the information and we knew we didn't have all the information regarding these things, we would – these are more statements of factors to consider. They're very important and some of the pitfalls that may occur if the process is not tracked carefully.

MS. O'BRIEN: Okay.

So it'd be for other witnesses to give evidence on whether or not they were considered?

DR. GILLILAND: Right.

MS. O'BRIEN: Okay.

Your next section here you go – you talk about the monthly progress reports. Now, these were – these monthly reports were issued monthly by Nalcor.

We've had a number of them entered into evidence, Commissioner. I'll just give you four references here: P-01854, P-01855, P-01856, and P-01857. These are different – they're at tabs 18 through 21 of your binder and the first one here is from 2013, the next one from 2014; we've taken a selection throughout the time.

In this section of your report, you raise – in the first paragraph here you talk about – the first sentence – second sentence is: "The format of the construction reports is not consistent throughout the project." And we can look at the reports themselves and we do see some differences on, you know, the format of the report, shall we say, as time progressed. Are you raising this as a criticism or is this just something that you're noting?

DR. GILLILAND: I guess it was – I think the point I was – the point I'm trying to make is that it was – it made it challenging and it wasn't immediately clear sometimes from month to month or over a period of time, it became difficult to interpret information that was presented.

So, one example of that would be the treatment of the DANs in the initial year or two of the project. So in 2014, for example, the DANs were categorized and presented, if you will, in a pie chart and – which is fine, and it sort of identifies how many and what status they were in, but it doesn't include anything related to cost or schedule implications.

Later in the project – so roughly in 2015 – the DANs started to be presented in a slightly different format. The pie chart in terms of numbers and status of them were presented, but there was an additional chart added later on, sort of starting in roughly 2015, that included the cost – the magnitude of estimated cost, ranging from some – the highest category was $20 million and up, down to the first category of being zero or unknown cost implications. And that information is much more useful, in my opinion, to understand the significance of the DANs as a part of a process of anticipating what the cost and schedule implications of the DANs might be in the future.

MS. O'BRIEN: Okay.

So, in that case, the information presented in the reports improved over time.

DR. GILLILAND: Correct.

MS. O'BRIEN: Okay.

DR. GILLILAND: Yeah, and I guess the – similar commentary could be added around the cost of construction. Anticipated forecasted cost,

it was – it's remained the same for extended periods of time, until updates were done – made at some point for some reason to the construction value of each component as well as the overall budget. And suddenly all the graphs would change based on those – the new budget.

So that's, in itself, not a bad thing. I mean, it's the data, but it makes it difficult to see the history – the historic, if you will, development of the project without leafing through many, many of these reports to understand the progression of the project.

MS. O'BRIEN: Okay.

One of the – still staying at the bottom of page 15, you say here – you make some comment about the DANs or the deviation alert notices. That many of them did not have a cost associated or potential cost associated with them, they were recorded as to be determined. And you note here that "is contrary to the intended purpose of using a DAN process and prevents forecasting of costs in any meaningful way." Can you explain to us the basis for this statement?

DR. GILLILAND: As I understand the DAN process as it was written in the management plan, the –

MS. O'BRIEN: Is there a particular reference you'd like us to go to? It should be at tab 7 of your book.

DR. GILLILAND: Not sure if I have the page number for the DAN discussion or where it was presented, but the intention of the DAN was to provide an early warning of potential change or deviation from the contract documents.

MS. O'BRIEN: Okay.

DR. GILLILAND: So the – this is very good, in my opinion, to have this early warning process. But without some sort of feedback around the significance of the DAN, it may be nothing or it may be something very serious. And so that is why not providing – just having a to be determined or without any information – even just a ballpark heads-up, I think we have a problem here type of statement, then it's really hard to understand or interpret the significance of the information.

MS. O'BRIEN: Okay.

A couple of other paragraphs I just wanted to take you on page 16. The last sentence there – or the last two sentences I think I'll read out of the first paragraph: "The forecast lines from month to month indicated that production would need to accelerate to rates not achieved up to that point if the current end date was to be achieved. Similarly, cost forecasts were calibrated to achieve the budgeted project cost rather than reflect the cost at completion based on the actual productivity rates."

Can you explain the basis for your conclusion there? And if it's helpful for us to go to any of the particular pages of those reports, we can certainly do that.

DR. GILLILAND: Certainly. The – I'm not sure which reports, but the – so the budget lines – and we can probably just pick one I guess. At some – it doesn't really matter which one we go to, to take a look at –

MS. O'BRIEN: So if we bring up P-01857, please, Madam Clerk, that'll be at tab 19 of your book.

So this is the monthly report ending June of 2016.

DR. GILLILAND: There are a series of graphs that plot progress and relative tracked to – if we go to page 62.

MS. O'BRIEN: Okay, on the bottom of the page?

DR. GILLILAND: That doesn't look like my 62. Maybe I have –

MS. O'BRIEN: Page 62, we always use the red numbers at the top right-hand corner –

DR. GILLILAND: That's –

MS. O'BRIEN: – of the page.

DR. GILLILAND: – yeah, that's what I'm looking at here.

This is January – no, I'm looking at the wrong one here.

MS. O'BRIEN: What tab number are you in?

DR. GILLILAND: I thought we were talking about 19?

MS. O'BRIEN: Oh, I might've given the wrong – I might've – that may be my fault.

Can we please bring up – you can stay where you are, Dr. Gilliland. P-01855 please, Madam Clerk?

I believe this will be a 2015 report – right there. Sorry, it's January 31, 2014. And can we please go to page, I think, 62? Is what you'd asked for, Dr. Gilliland?

DR. GILLILAND: Sixty-two.

MS. O'BRIEN: There we go.

DR. GILLILAND: So in this graph, it's early days of the project, but the red line on the left side there is tracking to a forecasted completion percentage of 100 per cent. And there's a schedule across – on the X axis of the graph. And the red line is below the blue dash line, which would be the planned – the planned performance. And so when you're below the planned line, you need to be able to accelerate the project to get yourself back on the line –

MS. O'BRIEN: Right.

DR. GILLILAND: – and geometrically you just simply – the curve needs to be steeper on the – to be beyond, to be greater or steeper than what is planned in order to get yourself back on schedule.

MS. O'BRIEN: Okay, I understand.

The second sentence that you've put there in – on page 16 of your report: "Similarly, cost forecasts were calibrated to achieve the budgeted project cost rather than reflect the cost at completion based on the actual productivity rates."

I'm gonna get you to explain that, too, but I'm also gonna go to the next paragraph of your report where you say: "Cumulative progress reporting for cost and productivity should have been used to forecast future performance based on current performance and costs. If this had been done, significant delays and cost overruns would have been forecasted, starting in the fall of 2014."

Can you give us the basis for that conclusion, please?

DR. GILLILAND: So I've got some references to specific reports that I was looking at when I was making that statement, but I'm not certain if they're in here. I'll just go to, you know, July of 2015 which is tab 20.

MS. O'BRIEN: So tab 20. That would be P-01856, please.

And is there –

DR. GILLILAND: So page 32.

MS. O'BRIEN: Okay.

DR. GILLILAND: Scrolling down to the chart at the bottom.

So here the project is further along and if – if you actually go back to March – this is for the overall project – and if you – you can see, certainly in this example, overall, if you go – if you move forward into 2015, the actual performance is falling below the progress required. And this graph actually doesn't have cost specifically attached to it. But the graph – the line that completes from beyond the current date of July 2015, the line is constructed to match up with the ultimate outcome in April of 2018 which is intended to be 100 per cent complete. But the production suggests that, you know, it – that it's really not going to be – it – it's not – the line is – seems to be just a break at the current date and then constructed to match the final outcome.

MS. O'BRIEN: You're just talking about the deviation here, where we start to see the actual cumulative earned really –

DR. GILLILAND: Right.

MS. O'BRIEN: – sagging below the forecast line –

DR. GILLILAND: Right.

MS. O'BRIEN: – trend line.

DR. GILLILAND: And then at the end of the red dots or the red line – the red line stops and that's at the current date July 2015. And beyond that, there's a blue line with blue tringles that has – it's more of a straight line and it's just added to match up with the curve for April '18.

Now based on the performance up to that date, I don't think there's any justification for drawing a line that looks like that. It should match the performance, it should be estimating the – the outcome of April in – April 2018 to be less than 100 per cent, in my opinion, which would then extend the schedule which is what you can conclude from this graph. The graphs related to cost in these same reports would there – could potentially then lead to higher than expected costs.

MS. O'BRIEN: Okay.

And so what you're talking about here is, right here, they're still – despite this sagging in the line, shall we say, they're still holding the same end date as in the forecast?

DR. GILLILAND: That's correct.

MS. O'BRIEN: Okay.

Last paragraph of this section I just wanted to get you to address: "Contingency drawdown does not seem to change significantly from month to month. It appears that contingency is not adjusted to reflect reduced progress for costs incurred, and DAN information was not used to update the necessary contingency allowance. It is not clear how contingency measurement was used through the course of the project."

Can you give us a little explanation of what you are pointing to there?

DR. GILLILAND: Yes.

You know, the – looking at the graphs from month to month and through the course of the reporting, I mostly find it very difficult to understand the graphs and the significance of them. I can't piece them – I can't piece the logic together in terms of the reflection of what is going on on the – going on with the project. The contingency being roughly 300 million to begin with. Never at any point in these graphs does the – and consumed within the first year of the project – none of the graphs that I looked at showed that the contingency had been consumed in the first year of the project.

So I couldn't understand the correlation.

MS. O'BRIEN: Okay. Thank you.

Commissioner, that concludes that section.

I would next be going on to the ICS, so it may be a good time for the morning break.

THE COMMISSIONER: All right.

So we'll adjourn now for 10 minutes.

CLERK: All rise.

Recess

CLERK: Please be seated.

THE COMMISSIONER: Okay, we're still missing Mr. Simmons. Can I ask somebody in the back just to make sure Mr. Simmons knows we're back on deck?

All right, go ahead, Ms. O'Brien.

MS. O'BRIEN: Thank you.

Next section of the report I'd like to address with you, Dr. Gilliland, is your section on the temporary enclosure. The summary of that is on page 5 but the detail and I think the right place for us to start is on page 16.

This is the ICS, the Integrated Cover Structure that we've already had evidence on. And I'm going to get you to go through the contents of your report on the ICS. I think, though, it would be helpful for us to bring up the drawing of the ICS –

DR. GILLILAND: Right.

MS. O'BRIEN: – to assist you with that.

DR. GILLILAND: Yes, absolutely.

MS. O'BRIEN: So the document that I'm going to bring up, Commissioner, is P-01964, it's at tab 12 of your binder. And this is the recommendation for award for the package CH0007, the – what was ultimately the Astaldi package. And if you could go, please, Madam Clerk to page 176 of this document.

So here, this is from a presentation that Astaldi put forward and it's on this – we see here this a drawing of the ICS and the next page, as well, is an overhead view; one is a side view and one's an overhead view. So we can refer to these documents or, Dr. Gilliland, you can refer to these documents as you explain what the – explain your opinions on the ICS as expressed in the report.

DR. GILLILAND: Certainly.

So the ICS structure was intended to cover the powerhouse portion of the project. And this is, what I would call, a cross-section through the Cover Structure and the blue and the green hatching shaded areas are the – is the dam structure itself at some point in the construction process. So it's not the complete powerhouse structure but it's a portion of it being completed.

Conceptually, you can see the – on the left-hand side there's a concrete truck in a – in the reception bay and similarly on the other side. On the right-hand side there's another reception bay with another – with a concrete pump and – sorry, there's a pump on the – on both sides, the left- and the right-hand side. So the concrete is intended to be pumped into the structure to complete the construction.

So I'll just make a point in my – on page 17 of my report I indicate that the concrete is moved by a bucket and this is not corrected – it was intended to be pumped.

MS. O'BRIEN: Okay. And that's a –

DR. GILLILAND: So –

MS. O'BRIEN: – clarification that you and I made yesterday when we were talking.

DR. GILLILAND: Yes.

MS. O'BRIEN: Okay.

DR. GILLILAND: So if we can go back to that diagram again the – there's some other really important points to note here. So, first of all, the pumping – there's a very light red line that follows from Grid A –

MS. O'BRIEN: So here's Grid A.

DR. GILLILAND: – right – at the ground level, over and up over the blue shaded area down to the concrete pump, between Grids B and C.

MS. O'BRIEN: Okay, so right to here. This was the pump?

DR. GILLILAND: That's correct.

MS. O'BRIEN: Okay.

DR. GILLILAND: So, similarly, the – I think the intent was to have a pump from Grid D – or pipe rather – or a pump – whether it's a hose or a pipe from Grid D over to the other – another concrete pump that's shown conceptually right there. Exactly.

So the pumps and the pipes for the concrete to get the pipe – to get the concrete to the pumps – is shown sitting on top of the blue hatched – the blue shaded areas rather, which is the concrete that this section is cutting through.

MS. O'BRIEN: Okay. Is it along here? Is this what I'm looking at here?

DR. GILLILAND: Right.

MS. O'BRIEN: Okay.

DR. GILLILAND: So the – what's important to realize is that the cross-section of the powerhouse changes as you move into different areas of the powerhouse structure. And so the profile of that pipe – were that – where the pump hose or pipe could be located would vary depending on the stage of construction.

So – and including at the very beginning of the project when there was no concrete and you simply have an open excavation it would be –

I'm not entirely certain whether – just based on this one sketch – that a process had been established to figure out how to pump the concrete to the required locations in the building, because if you go to the plan you can see that it's intended to go to all of the concrete pumps. So I wonder, I guess – it's a question to be raised that whether someone had thought through how that concrete distribution would happen through this pumping system.

The other – another – some very important points to notice are on long grids. On Grids B and C there are columns that support the roof of the enclosure structure.

MS. O'BRIEN: So here's the roof here. So it's a sloped roof, essentially. And so this is a column showing supporting the roof and this is a column supporting the roof.

DR. GILLILAND: Correct – oops.

And those columns go down to the – through the dam structure, through the – sorry – through the powerhouse structure onto the round foundations below the powerhouse, which – and the columns themselves actually go right through the powerhouse concrete structure as well.

So this is challenging, this presents some significant challenges to the project and the implementation of the enclosure – the Cover Structure, because those foundations for the interiors columns, as well as the columns themselves penetrating through the powerhouse, need to be coordinated with the original design team to ensure that they can be facilitated as – be integrated into the final structure.

MS. O'BRIEN: Okay.

DR. GILLILAND: So at some point if – when the Cover Structure is to be removed, a decision needs to be made as to whether those interior columns will remain embedded in the powerhouse or whether they would also – they would be removed in some way.

MS. O'BRIEN: Okay.

DR. GILLILAND: Which would require effort.

MS. O'BRIEN: And here – on the side view here we're seeing just two columns here but, I take it, there would have been more columns than that, not just two columns – probably in the overhead view we'd see there would have been multiple columns throughout the building or was there just two interior columns?

DR. GILLILAND: So, conceptually in this plan here, there – this is really just a conceptual drawing from the bid documents, so it's difficult to say how – you'd have to look at the final design documents to understand where exactly the final columns were proposed to be. But there would certainly be a line of columns, potentially three or four down each grid line.

MS. O'BRIEN: Yes, so there'd be more than two on the interior –

DR. GILLILAND: Right.

MS. O'BRIEN: – to hold up a roof of that –

DR. GILLILAND: Right.

MS. O'BRIEN: – size.

DR. GILLILAND: Yes, exactly.

MS. O'BRIEN: Yeah, okay.

DR. GILLILAND: So, this – that – this idea in and of itself is a very innovative idea and it's not a bad idea. And the idea of enclosing the powerhouse to facilitate construction is, certainly, an innovation worth consideration, no question about that.

But with something as complicated as this and the questions of logistics and the temporary – temporary requirements and the coordination that would be required with the original design of the powerhouse structure, this is – this would be a lot of work and it would require a significant effort on the part of the – of Astaldi as well as the design team, SNC, as well as the project management team to figure out all of – how all of these pieces would fit together and work and be integrated into the overall project.

So when something as innovative – but it's also very – it is very complicated to incorporate. In my experience, the idea of an enclosure structure

is not unusual, especially in the North. But when you add in the complicating factors of a – of the overhead cranes and the moving of materials around inside the building – inside the enclosure as part of the enclosure structure. That's a level of complication and risk to the process – to the construction process that is, in my experience, unique and very – and potentially more risk is added to the project and ultimately to the outcome of the project.

MS. O'BRIEN: Okay.

DR. GILLILAND: And given that and the importance of this and the critical path of the project and how it would potentially impact a great number of factors included in the construction of the overall project, a detailed evaluation of this enclosure – Integrated Cover system would be very important.

So it's not clear to me what – based on the documents I reviewed, I'm not certain what extent that evaluation process – extent of the evaluation process between all of the different parties. Because in an integrated team, everybody would need to be involved in understanding how it works and the pluses and minuses, the risks that go with it, how it would be integrated into the overall powerhouse structure potentially. The foundations – being coordinated with the foundations of the powerhouse.

All of these risks would need to be considered and verified. It would be in everybody's best interest to do so. The design team needs to ensure that it doesn't compromise the design; the contractor needs to ensure that it's going to meet the production – facilitate the production rates that they need to achieve, and the owner needs to make sure that it's not going to compromise their project.

MS. O'BRIEN: Okay.

And to that last point, I take it – although we've had lots of evidence to date, that, you know, it's really the contractor who is responsible for their methods and means of carrying out their contract. So in this case, it would be up to Astaldi, but you're saying the owner would still need to be involved. And is that because of the construction management piece and, I guess, because –

DR. GILLILAND: Right.

MS. O'BRIEN: – this can affect other contracts on the project as well?

DR. GILLILAND: Exactly.

MS. O'BRIEN: Okay.

And so this – in this overhead view here, we do see there's a number of overhead cranes here. So what I'm understanding you to say that that this was a very innovative idea. And you're not saying it was a bad idea, but you're saying it was – that this is not – this is complex and how it fits into the design is complex so that it would take time and effort to do a detailed analysis to ensure that this was the right solution, and you'd need to have time in your schedule to account for that evaluation, as well as – I guess – as the construction of the ICS. Is that fair to say?

DR. GILLILAND: That is correct, yes.

MS. O'BRIEN: Okay.

DR. GILLILAND: So the, you know, getting into some of the details on page 17 of the – of my report, I refer to site meeting minutes – and just as examples, in February of 2014 and also in November of 2014, meetings number six and number 38. So just indication that these items are mentioned in the construction minutes – or Astaldi construction minutes. And so from February to November – and I think even before February and even after November – this – the ICS structure was being discussed, coordinated, designed, modified due to site conditions, and all of these efforts were needed to make sure that everything was going to work properly as it needed to.

MS. O'BRIEN: Okay. And I think one of the other points you make in your report is that – it's here on page 17, "Without the ICS, Astaldi did not appear to have an alternate plan to deliver the required production rate in order to achieve … overall schedule." So: "Should the ICS not work, Astaldi would need to react quickly to find/buy/transport/erect/operate traditional construction cranes and determine how to meet

productivity targets within limited crane placement capacity. Without developing an alternate system quickly, significant delays and increased costs would result."

So I take – the point – you're saying, in the documents that you reviewed, they didn't have a – there wasn't a plan B documented at least?

DR. GILLILAND: No, it didn't seem – certainly in the initial stages, there were no indications that if this didn't work they would try something else, that they had an alternate strategy in place as a backup. I didn't see any indication of that.

MS. O'BRIEN: And I – I'm just – I'm not sure if I'm reading between the lines correctly, so I'm just going to put this to you, and you can tell me if I'm right or wrong. But are you suggesting here that because this was, you know, high-risk, very complex, innovative undertaking that there should have been consideration given to a plan B if it didn't work out?

DR. GILLILAND: Not necessarily in the early stages. It – if it was proceeding as anticipated, with no problems or no delays due to whatever level of coordination was required, then there would be – wouldn't necessarily be a need. But there could have been – based on the struggles with coordination, they could have, at that point, started to research how long it would take to do something else if needed.

MS. O'BRIEN: Okay. So when – at early indication that things are not going according to plan, is that when you're saying when you should start looking at the plan B for something like this?

DR. GILLILAND: Certainly the initial proposal should be discussed and reviewed with a high level of rigour to try to make it work if that's what the intent of the design team and the management team is – to make the proposal work from Astaldi. So that's where the initial attempts – initial efforts should have been and presumably were.

MS. O'BRIEN: Okay.

All right. And when you say presumably were, is this something – you don't know?

DR. GILLILAND: I don't know the full extent of the –

MS. O'BRIEN: Okay.

DR. GILLILAND: – efforts that were involved, no.

MS. O'BRIEN: Okay.

Page 18 now, we'll go to the next section of your report, which addresses contract structure. This is a very short section here. Can you just tell us what your main findings are with respect to the contract structure?

DR. GILLILAND: So it's not – this section is simply a statement of factors and considerations as opposed to a criticism or proposed alternate. It's – when you're – when you change – if you change from an EPCM contract to an integrated team structure, there are – can be changes or modifications that may or may not be desirable. Every contract structure has its strengths and its weaknesses, and so the people involved – the point is – for the comments – is that the people involved need to understand what those strengths and weaknesses are and compensate accordingly.

MS. O'BRIEN: All right, thank you.

And related to this is the next section: Work Package Sizes. So I understand that – you list here some of the – you do talk about best practice here on – you say that: "Best practice on large projects in remote locations is to provide large work packages." And you give some of the reasons for that in your report. And my understanding is that's what was done in the Muskrat Falls case. Is that consistent with your understanding?

DR. GILLILAND: Yes, it is.

MS. O'BRIEN: Okay.

And you do talk a little bit about – both in this – well, maybe I'll get back to that in a moment because I'm going to just go to the next section, which is the Project Management Structure section. These three sections are somewhat related to each other. And this talks about the – I think, the change in the EPCM to the integrated

management team. So if I can get you to perhaps give us an overview of what your findings were there, and then perhaps I'll go back –

DR. GILLILAND: Sure.

MS. O'BRIEN: – and ask questions on the three sections together.

DR. GILLILAND: So under the Project Management Structure section, I talk about again the change from the EPCM format to the integrated team approach. And the – generally speaking, changing project approach or format is not best practice through the course of a single project; however, there are reasons where their decisions are made to make the changes, and that's not necessarily a bad thing, but it's not best practice to have to do that. It's ultimately compensating for other factors that are identified and assumed to be more – or deemed to be more important or significant.

But when you do make changes, you have to understand – again, you have to understand the differences and the strengths and the weaknesses of both models. And even when you're including a project management team of the very same people from one model, call it the original model, which was EPCM, versus – and then the transition with the very same people shuffled into different roles – potentially different roles and with different responsibilities on the new integrated team approach, then there's risks of losing project memory.

And what I mean by that is that in the first structure, the EPCM structure in this case, you have people accustomed to, very familiar with a particular role and factors included in that part – consideration for that part, their part of the project. And you have other people who are responsible and very familiar with other aspects of the same project. But if you – and if you change those roles for those same individuals, now suddenly, their focus changes to a different role and a different set of priorities.

And the legacy, the knowledge that person gained and retained from their first set of responsibilities can potentially be lost. So for example, something as simple as not being invited to the same meeting that they used to be invited to, or getting invited to a different meeting where their previous background is not relevant to the conversation, whereas somebody else would have the background necessary to be fully effective in those situations.

Similarly, in document control, the thousands, tens of thousands, hundreds of thousands worth of documents created throughout the course of this project – if people are changing roles, coming and going as well, then the knowledge of simply having a document on record does not necessarily mean that the knowledge contained in that document is also retained by the team working on the project. They – some – these people in their new roles may not even be aware that a document exists, never mind know who the person was that created it or the person that has that particular set of knowledge.

MS. O'BRIEN: Okay.

And I think it probably flows very naturally from what you're saying. But if the change in – from one structure to the other, you're talking about just people, same people but with some change up in their roles and levels of responsibilities, I take it that that can be exacerbated or magnified if you have people who ultimately end up leaving the project because they're not happy with the new structure or their new roles and responsibilities under the new structure.

Is that fair to say?

DR. GILLILAND: Certainly, losing people during the course of a project with – over a very long period of time is problematic for – and a – obviously, well-known problem that occurs on every large project and every project that extends over a long period of time.

MS. O'BRIEN: Okay.

And you do address here a bit, as I understand the report, some of the changing of the risks and the responsibilities from the EPCM to the integrated management team between – when you have an EPCM contractor as opposed to when you have an owner-led integrated management team.

Can you give us a little more information on that, please?

DR. GILLILAND: In a – in an EPCM model, the CM for the project is ultimately responsible for coordination of – between tender packages and ensuring that pieces of work are integrated properly together in schedule and scope, and ensuring, with some skin in the game, if you will – typically to ensure that things run smoothly. So they're motivated to ensure that contracts are started and ended on time, and that subsequent phases of work are coordinated and transitioned properly to maintain schedule and to oversee how different contracts for different scopes of work interact with each other.

In an integrated project team approach, that line of responsibility can potentially become blurred. And you have a project manager, in this case Nalcor, you have the design team, which is SNC-Lavalin, and you have a contractor for a particular scope of work. And each person – the – each person managing the specific contract and the integration between the packages can become challenging because there could be design interfaces that need to be resolved or coordinated, so that would be the design team, SNC-Lavalin's role, to ensure that that works properly.

From a project management perspective, you have contract, contractual terms, coordination of schedule and those sorts of things to consider. And then the contractor, who is ultimately only concerned with their own specific scope of work in that contract.

MS. O'BRIEN: Mmm.

So, and I just wanna make sure I'm understanding correctly, so ultimately, when you had – when SNC-Lavalin, in this case, was doing the full EPCM scope, the CM part of that is construction management. So, when you have – even when you have large packages, you still have a number of interfaces – you know, how does the Astaldi contract interact with the ANDRITZ contract, et cetera.

DR. GILLILAND: Yup.

MS. O'BRIEN: So, it's the construction manager, the person – you know, it's the people doing the construction management that are responsible for ensuring, you know, that those interfaces and interactions go smoothly and, you know, the overall project progresses.

DR. GILLILAND: Right.

MS. O'BRIEN: And so, again, you talk a little bit about risk and incentivising. So am I – and you talk a bit about having, in your report, having a general contractor incentivised to keep that moving smoothly. So am I understanding you to say that there can be benefits to having whoever's – in the case of an EPCM contractor, that contractor have commercial incentives to ensure that the overall progress goes smoothly?

DR. GILLILAND: Certainly, yeah. In EPCM contracts, there are typically incentives structured in ways that I'm not familiar with. But I am aware of these certain incentive plans that through financial bonuses for early completion, for example, or penalties for late completion or causing of delays of other contracts or these sorts of penalty clauses that can be implemented into contracts.

MS. O'BRIEN: Okay.

And in the transition to an integrated management team where it's, therefore, an owner-led team, so the owner, say, becomes ultimately responsible for the construction management piece. Again, how I understand your report, you're saying that is really a transfer of risk. The risk that was with the EPCM contractor if they didn't do a good job of performing –

DR. GILLILAND: Correct.

MS. O'BRIEN: – their construction management, has now transitioned to the owner. Is that –?

DR. GILLILAND: That's right. In this case, that's what happened – yeah.

MS. O'BRIEN: Okay. All right

And, now you did – you do talk about in – one of the ways to ensure that the overall project proceeds, well, in particular with respect to the interfaces, is to have particular incentives or penalties with the contractors themselves, so that they meet their milestone dates and their

technical interface requirements so that the – where the different packages meet each other, so that goes smoothly.

Do you know whether such commercial incentives or penalties, disincentives were put in the contracts with respect to the Muskrat Falls Project?

DR. GILLILAND: I'm not aware of the details of it, no.

MS. O'BRIEN: Okay.

But I take it, from what you've written here, that you would consider that to be a positive thing, a good thing to do.

DR. GILLILAND: There's certainly contractual methods of incentivizing any party that's involved in the –

MS. O'BRIEN: Okay.

DR. GILLILAND: – in this project.

MS. O'BRIEN: And I understood just from – when we were preparing yesterday, you talked about the limitations of some of these – although, you know, having some of these commercial incentives or disincentives is a benefit, there are some limitations to that.

And can you just describe those, please?

DR. GILLILAND: Well, when you were looking at a specific scope of work, a – the contractor, in this case, would be, of course, focused on their particular scope as part of their contract. And they would be invested in ensuring that they're looking after their best interests, and monitoring and getting the work completed, but watching very carefully to understand what outside external forces are impacting their work. So they would be very quick to try to blame others for their shortcomings rather than trying to avoid, of course, any sort of damage clauses in their contract, and then deflecting, if you will, blame for the reasons for that occurring – whatever issues that might be occurring onto other parties.

MS. O'BRIEN: I just – finally in this section, I just want to point out on page 20 here you do talk about – a little bit about when it might be appropriate to transition, and just maybe if you could review the last two paragraphs of this section. So page 20, just before we get to productivity, review the last two paragraphs there –

DR. GILLILAND: Mm-hmm.

MS. O'BRIEN: – and give us some words around what's written here in the report.

DR. GILLILAND: So when – if changes need to be made it's more desirable, of course, to do – to make those changes earlier on in the project, as early as possible. Certainly, once construction begins, changing becomes much more of a challenge than in earlier stages when construction has not started – not yet started.

And, I guess, the other point to be made in the last paragraph is that product management requires a very strong on-site team. They are elements of oversight and management that can occur from a distance on a project, but for effective management there needs to be a strong site presence to provide the leadership and direction that everybody on site needs.

MS. O'BRIEN: All right. Thank you.

The next section of your report addresses productivity factors. Now, it's a lengthier section and it is fairly technical, so what I'm gonna ask you to do is just to give us an overview of the work that you did for this section and, you know, what you were intending to show what your results were.

DR. GILLILAND: So the intent of the section was to ultimately test, if you will, or sample what Astaldi, and also SNC and Nalcor – what they did in terms of understanding the productivity factors that would be – that would impact the construction at Muskrat Falls.

So the initial part of the section is really a discussion around the parameters that are already – that were laid out in the document by SNC. And then, our attempt to consider those options and look at the different possibilities in terms of what those variables would be. Also look at what Ibbs concluded regarding their study of the productivity and try to understand

what – where the differences may or may not have occurred. And then try to – we also sourced some other documents that we identified and had available to us to – which are included in the appendix – as references to try to get a sense for the context and whether these factors were appropriate or whether we would've suggested something else based on that information.

So, the ultimate conclusion, if you will, is that the Astaldi estimate used productivity factors that we would deem to be reasonable. And the difference between the SNC-Nalcor estimate and the Astaldi quote is as Paul Lemay said in his email: a perspective of optimism around what the productivity factors might be specifically related to the impact of labour shortages and weather.

MS. O'BRIEN: Okay.

DR. GILLILAND: So that's the overarching conclusion that we came to. There was – there's several other factors that are, I think, important to consider in this situation. The – yeah, the level of productivity was not achieved by Astaldi that they were anticipating in the bid – in their original bid. And there were a variety of factors identified by Ibbs and others that would explain why the productivity was not achieved – that wasn't achieved that was anticipated.

And I think another factor that became clear, certainly as part of the – and Ibbs has identified this as well, is that the impact – I think what was not captured, if you will, initially and certainly, I think, had an impact on how events played out were – was a factor that we would call the knock-on effects of – I think it's been referred to as knock-on effects of the impact of one contract on another or one change on subsequent work. When there's many, many changes happening and schedule delays occurring, more than one, then the impact of one change becomes magnified. And so it's not just the impact on one particular scope that needs to be considered, it's the impact of a change on one scope and that change would have on other scopes of work as well. So when you consider that, that seems to explain the differences between what was predicted or estimated and what actually occurred.

MS. O'BRIEN: Okay.

So just to summarize that as what I understand, is that in your assessment, the Astaldi – the productivity assumptions or rates that Astaldi used in developing their bid were reasonable and consistent with what – consistent with your own analysis. The productivity assumptions in the original DG3 estimate were more optimistic than what you would have deemed reasonable – that the SNC estimate –

DR. GILLILAND: Well, they were simply more optimistic.

MS. O'BRIEN: Okay.

DR. GILLILAND: I think still inside the realm of a reasonableness, at the time.

MS. O'BRIEN: Okay. But the Astaldi were more consistent with what your analysis – Williams Engineering analysis was? Am I –

DR. GILLILAND: Well, it seems to reflect more of the impact of labour shortage on the productivity factors that – that was our conclusion, that that was really where the Astaldi accounted for more struggles related to the labour shortage.

MS. O'BRIEN: Okay.

And you refer to Ibbs, so there's two Ibbs reports that have been entered in evidence as P-01928 and P-01929.

So Ibbs was a consulting – I think it's a particular – a fellow, but he may have others working for him. He came in and did an analysis of productivity on the site while it was ongoing. When Astaldi was experiencing all its difficulties he came in to look. And I think – and we'll get – have more evidence, Commissioner, on those reports in due course. But essentially he found that productivity was much – was poorer than had been anticipated. He felt it could be improved but he didn't – but his – he felt it could only be improved to a certain extent.

DR. GILLILAND: Correct, yes. And, in particular, in the summer months when construction was more productive as opposed to the winter where – especially without an enclosure structure – the construction is more challenging –

MS. O'BRIEN: Okay.

DR. GILLILAND: – if not impossible for an extended period of time.

MS. O'BRIEN: Okay. And so as I understand what you're saying, that because the productivity did – it never did achieve what the estimates had been. You consider this to be because of some of the knock-on effects, multiple delays, the circumstances on Muskrat Falls site itself.

DR. GILLILAND: Correct, yes.

MS. O'BRIEN: Okay. Thank you.

Next section in your report is Schedule. It's on page 26. And I'll get you to please summarize here – you do mention a number of best practices and if you can, please, focusing on those, review what your findings were in this section.

DR. GILLILAND: So in – when considering schedule it's important to look at risks, project risks, and incorporate the risks – the potential for risks and the occurrence of these actual coming to fruition of these risks in the – and the impact they might have on the schedule. So one – and allow – essentially adding a buffer for things like this to occur in the course of construction.

The other – another best practice is to be updating schedule on an ongoing basis periodically to reflect current conditions on site, especially on a project of a very long duration. It's important to have regular and predictable updates of what those – what the schedule would become over – evolve into being. And getting an – getting early and – warning or sort of real-time updates, obviously to – so everybody is aware of what's going.

MS. O'BRIEN: Okay.

And when you talk about updating the schedule, would that be the same as doing a re-baseline of the schedule?

DR. GILLILAND: Right.

MS. O'BRIEN: Okay. And you're saying that best practice is to do that regularly?

DR. GILLILAND: Regularly, and so –

MS. O'BRIEN: And with a set frequency, is that what…?

DR. GILLILAND: Regularly with a set frequency are the most important parameters. The – I think it would have been possible to do it on a monthly basis in this project, that was their period of reporting frequency for the project, but certainly – and in that order of magnitude of frequency would be appropriate.

MS. O'BRIEN: And from your – the review of the documents that you've seen with respect to this project how – was there a regular and predictable re-baselining?

DR. GILLILAND: No, it didn't seem that there was. The – and if we're going back to those – some of those graphs we were looking at earlier, the schedule seemed to remain the same until certain points where, especially in – I believe it was 2016 when it was re-baselined in July – June and July of that year where there was a very large re-baseline exercise undertaken and then reflected in to the documents.

MS. O'BRIEN: Okay.

So in that – from that point of view, you do not believe that what was done in the Muskrat Falls Project was consistent with best practice?

DR. GILLILAND: Correct.

MS. O'BRIEN: Okay.

Do talk about monthly. On page 28 you – there's two documents that you really address in this section of your report. You address the integrated project schedule which is there. And, Commissioner, that's been entered as Exhibit P-02336, it's at tab 9 of your book. And I don't believe we need to go there. I think you've highlighted what your findings were with respect to that already.

The other document that you looked at is the Astaldi award – the CH0007 award recommendation that – you cover that in section 8.2. So that's a document we already looked at a few minutes ago when we were looking at the ICS, and that's P-01964.

A couple of questions I had for you on this section of your report, in – on page 28, partway down – a little less than halfway down the page, "The schedule indicates that the site was to be prepared and ready for Astaldi in November 2013. Excavation details were not completed until" the "spring of 2014 resulting in delay to the start of concrete work as well as temporary enclosure planning. Hence, final bedrock elevations would not have been available for Astaldi to begin their work even if their contract had been awarded much earlier in 2012."

Can I just ask you: What was the source of that information that you've included in your report?

DR. GILLILAND: The notes are made in the Astaldi meeting minutes. That is where the – where they – it's noted that handover was delayed 'til December and then there was ice – water in the bottom of the excavation which froze and they were, I believe, unable to address the bearing conditions of the excavated site in order to prepare the bearing surface for the concrete to be poured, to be placed.

MS. O'BRIEN: Okay, so you were looking –

DR. GILLILAND: And that all – sorry, that also impacted the ICS design because, again, the – there were foundations that needed to be – for the ICS structure that needed to be incorporated into or below the powerhouse concrete structure.

MS. O'BRIEN: So I just want to make – so that was from Astaldi meeting minutes. And I believe P-02330 might be those minutes that have been entered into evidence. I just wanted to clarify what the source was there.

THE COMMISSIONER: 02300?

MS. O'BRIEN: Yes – sorry, 02330.

And so is it fair to say, Dr. Gilliland, that you would have been looking at Astaldi meeting – Astaldi's meeting minutes. You don't necessarily have what Nalcor – or another perspective on those statements might be?

DR. GILLILAND: That's right.

MS. O'BRIEN: Okay.

And then also on that same page – last paragraph, page 28, you say, "Only the Astaldi bid claimed to be able to place concrete during the winter." And I wanted to ask you about the source of that information.

DR. GILLILAND: It came from the recommendation of – for award summary report, but it – I believe I was actually referring to just the two shortlisted bidders. There was the Salini competing bid which was proposing to limit construction during the winter months as much as possible.

MS. O'BRIEN: Okay. So when you say only the Astaldi bid you're looking at, you were looking at where they did shortlist the two final bids. So Salini wasn't planning to place during the winter –

DR. GILLILAND: Right.

MS. O'BRIEN: – Astaldi was.

DR. GILLILAND: That's right.

MS. O'BRIEN: Okay.

The next section I'd like to go to is section 9 starting on page 29: "**Risk and Mitigation During Sanctioning and Construction**."

Can I get you to, again, give – review the – review your findings in this section with a particular focus on what you found to be best practice and whether or not you found it to be met.

DR. GILLILAND: So at the DG3 phase we were looking at a level – like, sorry, a Class 3 estimate, I believe, was the standard from the management plan. And at that point there was a certain level of engineering that was complete, and certainly a list of risks that had been identified for the project. And it's a comment more than a criticism because I'm not clear and certain that I have all of the information that I could make a definitive statement around whether all of those risks were incorporated into the documents.

So some of the – this is in these sort of middle – in the transition from a Class-5 to a Class-1 estimate, there's – the risks need to be dealt with

and tracked properly so that they're either incorporated into the construction documents or placed into that contingency in an order of magnitude that reflects the risk of the – the magnitude of the risk and the potential – potential cost risk.

So, that is – so, at the earliest, certainly up to DG3, that is the primary consideration when looking at mitigating risk, keeping track of all of those risks that have been identified and having a contingency sufficiently calculated to incorporate all of their risks that have yet to be quantified – sorry, that have been only estimated rather – but not included in a level of detail on the construction documents.

MS. O'BRIEN: And one of the items that you identify here in the bottom of the first paragraph on page 29: "Best practice is the schedule and cost implications associated with these risks are not removed from the project until the risk is eliminated."

So what I took from your report, generally – and you've come to it again, I think, in the second-last paragraph in this section when you talked about mitigation, I believe. What I understood from this – and please correct me if I'm wrong – is that you're saying best practice is that you assess what the risk is there, you may make plans, or should make plans to the best you can to mitigate it, but until the risk is actually eliminated, you still account for the risk in your contingency.

DR. GILLILAND: That's correct.

MS. O'BRIEN: So you may have a mitigation plan, but until you know that mitigation plan has been successful, you should still be carrying contingency for the risk. Am I understanding –?

DR. GILLILAND: That's – yes, that's correct.

MS. O'BRIEN: Okay.

And the last paragraph in this section here, I think is worthwhile pointing out. And that is, "The project contingency was exhausted during the first year of the project, when only limited effort was forecasted. Based on this, the contingency should have been re-calibrated immediately."

DR. GILLILAND: Right. This comes back to re-baselining or reassessing the schedule and budget implications of progress to date.

MS. O'BRIEN: All right.

Page 30 in this report, you do talk about the – both the DG2 QRA and the DG3. At section 9.2 is where you talk – address the DG3 QRA, which is the most relevant one, I think, to the work of the Commission. That's already been entered as Exhibit P-00130, and we looked at it a little bit earlier this morning.

I just wanted to point out here and get your comment on – in the first paragraph here, you talk about how the project cost increased between DG2 and DG3, and we've had evidence to that already. You write, "The significant increase should have triggered a re-assessment of the assumed workplans for the project."

So I just want to get a sense of – are you suggesting here that that was not done? Or are you just – or is that something you don't know whether it was done or not and you're just pointing out that when you have a revised estimate that goes up significantly, that's something that should be done?

DR. GILLILAND: Yes, it is something that should be done. I'm not aware of all of the efforts that were undertaken at that time to assess or reassess what was done with that information.

MS. O'BRIEN: Okay.

DR. GILLILAND: But an increase of such – that magnitude would definitely justify a reassessment.

MS. O'BRIEN: Okay. The third paragraph there – again in that section on page 30 – "The fundamental difference between the workplan budget and schedule development compared to the Monte Carlo results is that risk variables were not included in the traditional workplan when mitigation strategies were identified during the planning process."

Can you just explain to me what you meant by that paragraph?

DR. GILLILAND: This comes, to a certain extent, back to my original comments – some previous comments, rather – around bottom-up versus top-down estimating and ensuring that all of the risk parameters are included in calculations. So in the bottom-up approach, the construction documents are used to generate an estimate of work. But those – certainly before they're complete, there will be many things that are not included on those construction documents that need to be factored into the overall budget and schedule.

A Monte Carlo will give – provides the opportunity to provide – to quantify the risk, and the likely outcomes – based on those, the risk and uncertainty around the values that are anticipated at that time.

And, so the Monte Carlo simulation therefore would generate a larger budget and a larger – a more extended schedule than a work plan format would unless the work format – the work plan format bottom-up approach also includes factors to account for the risk items that are not shown on the documents.

MS. O'BRIEN: Okay.

All right.

I think the rest of that section is fairly clear and just reading it I think the meaning comes through, so I won't spend any more time on that.

The final section I want to go to is the geotechnical risk and mitigation section. So, this section, I had a little difficulty when I first read it and I worked that out with you yesterday. So, I understand that section 10.1 is largely a review of the document here that is identified in the title "Muskrat Falls Hydroelectric Development – Volume 1 – Engineering Report."

DR. GILLILAND: Right.

MS. O'BRIEN: Okay.

And, Commissioner, that document has been entered as Exhibit P-00022. So, this section, this is looking at – this is the 1999, I think, a January 1999 document that is reviewed in some detail here in your report. Your – Williams Engineering's conclusions with respect to that report and also with respect to the geotechnical investigation on the Muskrat Falls site itself, distinct from the transmission line.

DR. GILLILAND: Mm-hmm.

MS. O'BRIEN: It's not found in this section of your report but it is found in the summary section on your findings on page 9.

DR. GILLILAND: They're certainly summarized on page 9. They are woven into some of the commentary in this section as well and it's important to appreciate the very first sentence of this section 10 which is – the intent of this section is to illustrate how this information could be used and applied for the purposes of planning and construction for the project.

MS. O'BRIEN: Okay. So, I'll just maybe get you to summarize and I'm going to go to page 9 where you have some of your findings set out –

DR. GILLILAND: Right.

MS. O'BRIEN: – in this section.

And again, right now let's focus on the Muskrat Falls site itself and then in a few minutes from now we'll go to the transmission line.

Can you just give us a summary of what your conclusions were with respect to the geotechnical risk and mitigation in Muskrat Falls?

DR. GILLILAND: So, generally speaking – and it's also reflected in this document that we reviewed – is that there really was insufficient information and data available to quantify and mitigate the risks that in some cases did materialize during the course of construction.

So an example of that would be the – and again, coming from the Astaldi notes around – meeting minutes, rather, construction minutes – around how the site, the excavation, was continuing to fill with water, and they were unable to control the water in the excavation.

So, that is the sort of risk that was identified, I believe, earlier – early on in the project, and identified that – but that could've been

potentially mitigated by further investigation, further boreholes at the location to identify the – or to try to quantify the extent of fractures, fissures, or – which are the channels, if you will, that it would – that sort of migrate through the bedrock or through the subgrade for the dam – that would then be allowed to percolate up into the excavation.

So with further investigation – geotechnical investigation, it would've – the intent would've been – and there is no guarantee – but the intent would've been to try to quantify or estimate, based on the additional data, the extent that this problem might occur.

MS. O'BRIEN: Okay.

So if for whatever reason you're unable to do the – a significant amount of geotechnical investigation in advance, and I would assume there's always some limits to the amount of geotechnical investigation that –

DR. GILLILAND: Right.

MS. O'BRIEN: – you can do in advance, because if it's underground or under a river, there's only so much information you're gonna be able to get at.

So, if you have limited information, what's – in terms of your assessment of best practice, what should be done about that?

DR. GILLILAND: Well, there – I mean, there are techniques for determining geotechnical conditions under a river. You can directional drill and get to the location where the foundations will be bearing; it is possible to do that.

So the best practice, though, if the – a risk is identified, is to attempt to describe it and what the consequences of that risk might be. And without data, it's honestly very difficult to quantify that in a detailed sense. There's experience to draw on, but ultimately geotechnical conditions are very unique and site-specific, and so, therefore, represent a significant challenge to any project. That warrants detailed investigation, as much investigation as possible, in order to mitigate risks that can be very significant.

So, in terms of – and so the best practice is to include those risks in some way, shape or form to – in the schedule, by making allowances for additional work that might be required, as well as cost that would go with doing that additional work.

MS. O'BRIEN: Okay, so you carry, either in contingency or allowance, you carry some float or extra dollars –

DR. GILLILAND: Right.

MS. O'BRIEN: – to account for the result if the risks do materialize.

DR. GILLILAND: So contingency is – you know, it evolves over the course of a project. And the contingency, as I said earlier, is for items that no one could possibly – that no one has thought of yet, so for the unforeseen. So at some point these allowances, if you will, can be rolled into – will get rolled into a contingency.

So it's important to look at the contingency and understand whether the size of the contingency from a dollars perspective – but also a contingency in terms of schedule would be – is sufficient to address the risks that are being rolled up into the contingency.

MS. O'BRIEN: Okay.

And contingency in terms of schedule is sometimes referred to as float, is that fair to say?

DR. GILLILAND: Right. Float, yeah.

MS. O'BRIEN: All right, I'm going to go to your findings with respect to the transmission lines now and, again, that's on page 38 of your report.

And you talk a bit about the investigations that were done and how there was very little field data available at the time of the – the estimate was being finalized. You talk here about: "Best practice is to attend each tower location and complete a minimum of one borehole per tower location. Depending on soil conditions, a site investigation might include an alternate investigation method such as a test pit (digging a hole), confirmation of bedrock conditions, or other appropriate testing techniques."

So can you tell us a bit about your basis for citing this as a best practice? And I think we'd be interested to hear – I mean this was a very long, long transmission line through green field or, you know, virgin territory, not land that was already cleared or, you know, there was a road or a highway running alongside of it. I mean we were into the – the route was through some fairly remote areas of the province.

DR. GILLILAND: Mmm.

MS. O'BRIEN: So can you just tell us, you know, why you feel this is best practice and how does that translate when you have a long transmission line through the type of territory we have here?

DR. GILLILAND: This project is – as you know, even the planning phases has been going on, you know, pick a decade when this project was being conceptualized and discussed back to the '70s and the evolution of the planning and the details for the project had evolved up to where we are today. That's a very long period of time.

Certainly, at the early stages of conceptualization of a project would not be expected to have that level of – attending every site and that level of detail, of knowing geotechnical conditions at every single location. That would not be expected for any type of project.

The consequences of getting the geotechnical conditions wrong or making incorrect assumptions are – can be very significant. And if it's – you know, if it's a – if it's in a city or – it's very easy to do a borehole and just confirm information. When it's in the remote locations, that's very hard, it takes a lot of effort.

But that's actually a reflection of the amount of effort that's going to be required for the construction. So the intention of attending every site is to assess many factors, including the exact detailed conditions at a given location, because if it's not correct that can have very detrimental effects on cost or schedule, what materials have been order ordered in advance and planned in anticipation of being able to construct, in this case, the transmission tower. It may not be possible. They might have to make changes.

In the North in – called the Northern part of Canada, Labrador included, the soil conditions are highly variable and this is everywhere. So within a matter of feet – literally feet – sometimes less than the difference – distance between me and you, the soil conditions or the geotechnical conditions can change from rock, granite, bedrock to bog where there is no discernible bedrock at all. It would be – presumably it's there but it's just so deep that you literally cannot find it.

In those circumstances this would – this can have a massive impact on, first of all, just gaining access to the site and subsequent transmission tower locations. So that knowledge is really important to ensure that risks are mitigated and proper planning can occur.

The foundation for a transmission tower varies and there's different techniques and styles and things, piles versus rock anchors and these sorts things. And if it's not planned properly then you have to swap out, change plans ultimately, and, ultimately, potentially, buy new materials; scheduling impacts that come with having to replan and reorder and make changes and troubles related to accessing sites.

So the towers are spread out enough that it's very important that – I mean, you can change, as I said, from bedrock to bog in a matter of feet and so the spacing between these towers is, you know, hundreds of metres on occasion. And access is a real concern for these locations.

So the consequences of not getting one of these towers right in the planning stages can be very significant. In the role of construction it is conceivable that projects have been cancelled because of unforeseen geotechnical conditions, or at the very least, relocated or having to incur significant changes because of unforeseen geotechnical conditions. So I can't underemphasize the importance of understanding geotechnical conditions at a construction site.

MS. O'BRIEN: Okay, thank you.

Those are the questions that I had for you prior to you starting your cross-examination. Was there anything in your report that you wanted to ensure that you had a chance to highlight for the

Commissioner's benefit that you have not already had a chance to highlight this morning?

DR. GILLILAND: I believe we touched on everything.

MS. O'BRIEN: Okay.

DR. GILLILAND: Thank you.

MS. O'BRIEN: Thank you very much.

Those are my questions.

THE COMMISSIONER: Thank you.

All right, Government of Newfoundland and Labrador?

MR. RALPH: No questions, Commissioner.

THE COMMISSIONER: Nalcor Energy?

And, Mr. Simmons, if you're not finished we'll just – we will take a break at some stage. I'll go as long as I can so as not to interrupt you.

MR. SIMMONS: Yes, I'm sure. But the break at 12:30 will work fine I think.

THE COMMISSIONER: All right.

MR. SIMMONS: Yeah.

In fact, what I might do, Commissioner, is I might tackle one topic or two and if we're close to 12:30 that might be a convenient time to break then.

So, Dr. Gilliland, it's convenient actually for us just to pick up on the geotechnical issues that you were talking about. And if I understand correctly, the section of the report – which I think is section 10 dealing with geotechnical risk – that was likely written by Ms. Porter, was it?

DR. GILLILAND: That's correct, yeah.

MR. SIMMONS: Okay, so that's – this is not directly your own work. You're reporting on the work she did in preparing this analysis, are you?

DR. GILLILAND: That's correct. She did the review and I'm speaking – the passion on my comments is – actually comes from my own personal experience as related to –

MR. SIMMONS: Sure.

DR. GILLILAND: – geotechnical conditions.

MR. SIMMONS: Right, okay.

So I'm going to ask you first – talk to you first about the geotechnical investigation of the powerhouse. And for the information on that geotechnical investigation was the 1999 feasibility study done by SNC-AGRA, the source of your information about what geotechnical investigation had been done for the powerhouse.

DR. GILLILAND: The – it was the 1998 document in the review and the comments made in that.

MR. SIMMONS: Let's – just bear with me for a moment. It's P-00022, so maybe we can bring that up, please? Okay –

THE COMMISSIONER: That's at tab 22 of your book.

DR. GILLILAND: Thank you.

MR. SIMMONS: Oh yes. Thank you, Commissioner.

So, first of all, this is described as a feasibility study. So in the range of development of planning for a major project, where does a feasibility study fit in?

DR. GILLILAND: In the very early stages, for sure.

MR. SIMMONS: How much work would you expect to be done after a feasibility study before you reach the point where you're actually sanctioning the project and beginning to tender the work?

DR. GILLILAND: So at the DG3 point, you mean?

MR. SIMMONS: Sure.

DR. GILLILAND: Is that – roughly?

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: How much? Well, it's – it really depends honestly and it varies from project to project and circumstance to circumstance –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – as to when work – the (inaudible) work would be completed.

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: Yeah, the – there's recommendations on timing on some of the factors that are in that report in terms of when it would be recommended to do the work. But it certainly would not be expected to be 100 per cent complete at that point.

MR. SIMMONS: Okay.

So the feasibility study, I'm going to suggest, is a fairly high-level –

DR. GILLILAND: Right.

MR. SIMMONS: – overview. The design concept is probably there but is not fully developed –

DR. GILLILAND: Right.

MR. SIMMONS: – and certainly engineering design work is not done –

DR. GILLILAND: That's right.

MR. SIMMONS: – correct?

DR. GILLILAND: Yeah.

MR. SIMMONS: Right?

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: And contract strategy may be developed. There may be an idea about it, but it's not fully developed. It's not refined to the point where contracts are going to be let?

DR. GILLILAND: Right.

MR. SIMMONS: Correct?

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: So you would expect a lot of things to happen after this feasibility report is prepared, before you get to the point where you've got a set of drawings that you could put out to tender and get contractors to bid on?

DR. GILLILAND: Right.

MR. SIMMONS: Right. So did you do any work to, kind of, track that process for the Lower Churchill Project and see how much all that work developed after this feasibility study was done for the Muskrat Falls site in 1999?

DR. GILLILAND: We only have several documents related. One for the transmission and one for the – some of the site –

MR. SIMMONS: Okay.

DR. GILLILAND: – boreholes that were done for some of the other – the minor pieces, if you will, around the dam.

MR. SIMMONS: So there's a section in this report, which is volume 1 of the feasibility study –

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: – that does describe the geotechnical work that was done at the site. And I'm not going to be able to get the page number right now. But I note from the report that there was also a volume 2 –

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: – which had detailed geotechnical work in it. And am I correct that in your report you've noted that you did not have volume 2 available –

DR. GILLILAND: That's –

MR. SIMMONS: – and did not review it?

DR. GILLILAND: That's correct.

MR. SIMMONS: So you're working from the summary information not from the detailed information even from this feasibility study?

DR. GILLILAND: Correct, yes.

MR. SIMMONS: Do you know what other geotechnical work was done to investigate the powerhouse site, the spillway site and the dam sites after 1999?

DR. GILLILAND: No, we don't have any evidence of that other than those two other documents that are mentioned in that section.

MR. SIMMONS: Okay. Do you know if any other work was done to investigate sites?

DR. GILLILAND: Not aware of –

MR. SIMMONS: Did you make any inquiries to find out if any other work had been done to investigate the sites?

DR. GILLILAND: Yes, we did.

MR. SIMMONS: And what were those inquiries? Who did you inquire of?

DR. GILLILAND: Grant Thornton.

MR. SIMMONS: Okay. Did you make any inquiries of Nalcor Energy or any of the related companies involved in the development of the project?

DR. GILLILAND: No, we did not.

MR. SIMMONS: Did you ask Grant Thornton to do so?

DR. GILLILAND: We were advised by Grant Thornton to limit our comments to what was provided.

MR. SIMMONS: Did you – knowing that this is a feasibility study completed 13 years –

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: – before the project was sanctioned, did you consider that an adequate effort to obtain up-to-date information on the geotechnical work that had been done on the site?

DR. GILLILAND: The point of the commentary was not to pass criticism on any particular party but to simply highlight what would have been expected at that – as best practice. So whether there was work done or not would not necessarily impact our comments at that point so we did not pursue it further.

MR. SIMMONS: Let's go to page 9 of your report, please, Madam Clerk. That's Exhibit P-01678. Scroll down a little. This is your conclusions regarding Geotechnical Risk and Mitigation. And in paragraph 36 it stresses the powerhouse. And you say: "It appears that schedule and cost risks due to uncertain geotechnical conditions at the powerhouse location were not considered in the project planning and detailed scheduling of" – the – "work."

How can you make that conclusion when you had nothing available other than the 1999 feasibility study for the powerhouse site?

DR. GILLILAND: Well, there was no mention in the documents they reviewed. We reviewed of – other information.

MR. SIMMONS: And what other information did you review? Regarding the geotechnical investigation at –

DR. GILLILAND: No, I think that's my –

MR. SIMMONS: – the powerhouse site?

DR. GILLILAND: – point. I didn't. There were no other documents that were referenced and were mentioned.

MR. SIMMONS: Okay. Did you actually ask – in your request to Grant Thornton, did you actually ask them to go back and see if there was more up-to-date geotechnical work?

DR. GILLILAND: The point of this review was not to dive into the past of the geotechnical –

MR. SIMMONS: Right.

DR. GILLILAND: – processes. And the comments, again, as I made them here are a reflection of what we considered to be the best practice forward.

MR. SIMMONS: Okay. Well, I don't read that sentence in paragraph 36 that way. I don't read it as being a statement of what theoretical best practice is and I certainly don't read it as being limited to the limited information that was available from a 13-year-old report on the geotechnical conditions of the site. Maybe I'm reading it wrong but I don't read it that way. I don't read it as qualified by either of those things.

Am I reading it wrong?

DR. GILLILAND: Well, the whole report is a – had the caveat of – based on information as it's currently available.

MR. SIMMONS: Right.

So, that's a general statement at the end.

DR. GILLILAND: Right.

MR. SIMMONS: But here's a specific example where you were working on very old information, you had not been – there had been – no – as far as I can tell – investigation done to ensure that that was the most up-to-date and accurate information.

And when you make a statement to say that this was, you know, this was not considered in the project planning, these things were not considered without qualification, I would have expected that at that point you would have been careful to qualify your statement on the basis of the limited information you had available.

My question is why not? Why didn't you do it?

DR. GILLILAND: Why didn't I add the caveat in that particular instance?

MR. SIMMONS: Yes.

DR. GILLILAND: I'm not sure that I contemplated adding whether – the need to do so.

MR. SIMMONS: Okay.

Thank you.

Now I may not have the right reference, Madam Clerk, but if we can bring up Exhibit – oh wait, here it is – P-01899, please.

So this is one of the exhibits that was entered this morning and it is a December 13, 2011 memo from Mr. Luc Chaussé of SNC-Lavalin to Mr. Darren DeBourke who was on the management team at Nalcor. And this is one of the items that's referred to in the list of materials that you had available for your review.

The subject is: Gate 3 Deliverables – Geotechnical Survey, Data Acquisition and Analysis. And it starts out by saying: "In Stage 2, in order to develop the Gate 3 cost estimates, use was made of existing references," And then it lists a number of things in A. Now under A, the second bullet says: "SNC Lavalin/BAE New Plan June 2011 Report Muskrat Falls 2010 Site Investigations Geotechnica."

So, this was a document – this was a reference in a document you had available. Did anyone on your team look for the 2011 report into the 2010 site investigations in order to supplement your information before you expressed the opinion you did in paragraph 26?

DR. GILLILAND: Bear with me just for one second while I'm checking. It does look like a familiar document name but I could be – I could have it wrong. I guess I'm not certain about whether or not these two Nalcor references here are one of those documents or not.

There was certainly – I mean, I – I bring this up only because it looks familiar in terms of having borehole information at the substation location and that – those sorts of locations that were not – not at the powerhouse, for example. So I'm not certain that – I'm not certain that we didn't consider that.

MR. SIMMONS: Okay. So you don't know.

Okay, well this might be a good time to break, Commissioner and over lunch break if you wanted to consider that and see if you can identify the list of documents that you had

available, if that particular investigation report is included I'd appreciate knowing after we come back after the lunch break.

DR. GILLILAND: Yup.

MR. SIMMONS: Okay. Thank you.

THE COMMISSIONER: Mr. –

MS. O'BRIEN: Just to clarify, Mr. Simmons has asked him to do an investigation; if he's under cross-examination I wouldn't normally be speaking to him. May want to clarify whether it's acceptable for him to call Ms. Porter who did that section –

MR. SIMMONS: Yeah, there's – there's a list in – there's an Exhibit that's been provided which lists all the documents that were relied on in your work, I believe. So – and I think if it – if this one was used you should be able to find it on that list; so I'm not asking you to do anything more than review the list of what we've been told was provided –

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: – and see if you can find that document in it. Okay.

THE COMMISSIONER: Do you understand what you're being asked to do?

DR. GILLILAND: I believe so, yes.

THE COMMISSIONER: Okay.

All right. I think we'd like – I think I'd like to bring us back a little earlier this afternoon so I'm going to come back at quarter to 2 today. Okay?

MR. SIMMONS: Thank you, Commissioner.

THE COMMISSIONER: All right.

CLERK: All rise.

Recess

CLERK: All rise.

This Commission of Inquiry is now in session. Please be seated.

THE COMMISSIONER: All right.

Mr. Simmons, are you ready?

MR. SIMMONS: Thank you, Commissioner.

Dr. Gilliland, when we broke for lunch, you were going to have a look in the list of documents that had been used by Williams Engineering to prepare the report for a particular geotechnical investigation that we'd identified. And I understand you've been able to locate that?

DR. GILLILAND: Yeah, I think it was just – I knew it looked familiar for a reason. It's included –

MR. SIMMONS: And we – maybe we'll find it's in – Exhibit 02330 is the list of documents so, Madam Clerk, if we can bring that up?

DR. GILLILAND: Sure. For me on page 38 of my report it's listed as Nalcor document 0020638.

MR. SIMMONS: Oh, so you're looking at your report on page 38.

DR. GILLILAND: Correct.

MR. SIMMONS: And that's actually page – yeah, that would be –

DR. GILLILAND: Page 38 of my report. It's the first one on of the list of two.

MR. SIMMONS: Oh yes, okay. Yeah.

THE COMMISSIONER: Okay so, I'm sorry, I'm not sure I'm seeing where you are.

MR. SIMMONS: Okay, so this is page 38 of Exhibit 01678, which is the Williams Engineering report in the section called "10.2 Transmission Line Geotechnical Investigations" and there are two listed there. Mr. –

THE COMMISSIONER: Yes.

MR. SIMMONS: – Dr. Gilliland, is that –

DR. GILLILAND: Yes, that's correct.

MR. SIMMONS: – where you are?

DR. GILLILAND: That's where it is.

MR. SIMMONS: Okay.

And you're saying one of these two documents is the 2011 geotechnical report that we referred to.

DR. GILLILAND: That's correct, yeah. You got it listed as Exhibit 01899 – CIMFP Exhibit P-01899, tab 14.

MR. SIMMONS: Okay.

Okay, well, if we bring up 01899, that's the document I referred you to which has the reference to the 2011 report.

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: My question had been whether you had the 2011 geotechnical data for the powerhouse –

DR. GILLILAND: So the –

MR. SIMMONS: – that's referenced here.

DR. GILLILAND: The second bullet on the screen here.

MR. SIMMONS: Yes.

DR. GILLILAND: And, no, we do not.

MR. SIMMONS: Okay, so the answer is, no, you did not have that information.

DR. GILLILAND: Right.

MR. SIMMONS: All right. Thank you.

Let's go back, then, in your report, Exhibit 01678, and we'll go back again to page 9. And I'd been asking you some questions about paragraph 36 which was the comments on the geotechnical conditions at the powerhouse.

And my next question on that is: Are you aware of whether there were any unforeseen geotechnical issues with the powerhouse, spillway or dam sites that contributed to any cost or schedule – cost increase or schedule delay?

DR. GILLILAND: Well, based on the Astaldi construction meeting minutes from – that I referred to earlier in the – that's where the reference in the Astaldi –

MR. SIMMONS: Okay.

DR. GILLILAND: – minutes is.

MR. SIMMONS: So there's one reference here to delays due to dewatering and foundation treatment. Aside from that reference that you found in the Astaldi minutes, are you aware of any issues with the geotechnical condition of the site that had been unforeseen prior to work starting?

DR. GILLILAND: I didn't go through every single construction meeting set of minutes to make a detailed list so I can't say for certain but, currently, no.

MR. SIMMONS: Okay.

So that's – this is the only example that you've got. And this example says: "Delays due to dewatering and foundation treatment …." So explain to me again what the problem was so we understand what happened and how it relates to geotechnical investigation –

DR. GILLILAND: Sure.

MR. SIMMONS: – based on what you determined.

DR. GILLILAND: Okay.

As I understand the description, they were attempting to – well, there was water coming in to the excavation and Astaldi refers to pumps that they had to try to keep – to try to pump the water out of the excavation and keep up – and usually you try to have pumps sufficient so you can keep up with the rate at which the water is entering the excavation.

MR. SIMMONS: Okay.

DR. GILLILAND: And so they were presumably unable to do that and then they refer to the water in the excavation freezing –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – which makes it impossible, of course, to dewater at that point.

MR. SIMMONS: Do you know how the water was getting in the excavation?

DR. GILLILAND: Well, the implication was that it was coming up through the rock.

MR. SIMMONS: Okay.

Did you consider that the excavation was behind the temporary copper dam?

DR. GILLILAND: Did I consider that?

MR. SIMMONS: Yes.

DR. GILLILAND: No, I did not.

MR. SIMMONS: Okay.

Did you do any analysis yourself to determine whether there was any connection between the extent of geotechnical investigation and accumulation of water in the excavation?

DR. GILLILAND: No.

MR. SIMMONS: Or did you just take this on face value based on what you read in the Astaldi meeting minutes?

DR. GILLILAND: On face value.

MR. SIMMONS: Okay.

And do you know whose responsibility it was to keep the water out of the excavation?

DR. GILLILAND: At that point in the project before it was handed over, the previous contractor, whoever that was.

MR. SIMMONS: Okay.

Do you know when the excavation site was handed over to Astaldi?

DR. GILLILAND: I believe it was, I'm going to say January, maybe December.

MR. SIMMONS: Okay.

And do you know when the water froze in the excavation, whether it was before or after the site was handed over to Astaldi?

DR. GILLILAND: That, I'm not certain.

MR. SIMMONS: You don't know. Okay.

And that's the only example you have of there being any type of geotechnical issue at the powerhouse site?

DR. GILLILAND: Correct.

MR. SIMMONS: Okay.

DR. GILLILAND: It's certainly not an exhaustive –

MR. SIMMONS: Right. And I'm going to suggest that you don't even know if that really is a geotechnical issue because you don't know what the source of the water in the excavation site was.

DR. GILLILAND: Well, I guess you can suggest that.

MR. SIMMONS: Okay. Well, is that correct?

DR. GILLILAND: I'm not certain of it, so I didn't do it in the detailed evaluation to – into the –

MR. SIMMONS: Okay. Thank you.

DR. GILLILAND: – situation.

MR. SIMMONS: Now, in your report – if we can go to page 31, please. So this is the section dealing here – if we scroll down a little here in section 10, this is where the geotechnical risk mitigation section starts. And I think Ms. O'Brien has probably reviewed this with you already I think.

But this report – this section of the report seems to be just a review of that 1999 feasibility study.

And when we see headings here– subheadings – they're actually taken from that study, right?

DR. GILLILAND: Yeah.

MR. SIMMONS: So the first one here under 10.1, Executive Summary, that's not your report's executive summary, that's the feasibility report's executive summary.

DR. GILLILAND: That's correct.

MR. SIMMONS: Right? And any time we see a section referenced it's a reference to that report. I had some trouble figuring –

DR. GILLILAND: That's right.

MR. SIMMONS: – that out when I read this first.

DR. GILLILAND: Yeah.

MR. SIMMONS: But after a while that became a little clearer. And if we go over – this continues over until we reach page 38, please, which is where the Transmission Line Geotechnical Investigations –

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: – is described.

DR. GILLILAND: Right.

MR. SIMMONS: And we'll scroll down to the last paragraph on that page. So this paragraph begins: "Best practice is to attend each tower location and complete a minimum of one borehole per tower location."

So I've asked a number of witnesses along the way –and this is day 79 of this Inquiry now, by my count – about what best practices are and how we figure them out.

DR. GILLILAND: Mmm.

MR. SIMMONS: Because as lawyers, in other circumstances, we are used to the idea that there can be a standard set up against which conduct is measured, but that standard had to be fairly clearly defined and understood that it has some authority before you could compare an actual set of events to it.

And I see the term best practice used a lot in the construction industry, but I'm still not completely clear on how we reliably know where we look to figure out reliably what's recognized as a best practice and I'll give you some alternatives. There could be an accepted standard adopted by an authority. The Canada building code would set out, I'd suggest, some best practices. And, beyond that, I'm still not totally clear on how we settle on agreement on what's a best practice.

So can you give me some more comment on that because you've used the term extensively in your report when you've described standards that presumably we should be comparing what happened on this project to.

DR. GILLILAND: Okay.

The – well, standards and codes, I guess, speak for themselves. They're a minimum standard to which everything must be based.

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: Exceeding those standards is acceptable, but going below them are not.

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: So that answers part of the examples you gave.

In terms of what is best practice, you're right, it can vary from place to place and certainly from time to time as over things – as things – as time evolves, technology information evolves. So it's not a static concept.

In this particular situation regarding attending each tower location or each –

MR. SIMMONS: Yeah, well I'll ask you –

DR. GILLILAND: – then I would say –

MR. SIMMONS: – specific questions about that, but just on this best practice idea.

DR. GILLILAND: Okay.

MR. SIMMONS: I can understand that someone who's got a recognized expertise in a particular area can express an opinion which we can place a lot of weight on. But I'm not sure that that always means that it rises to the level of being an industry-recognized best practice. And I'm still having trouble finding – figuring out when it's appropriate –

DR. GILLILAND: Right.

MR. SIMMONS: – for us to say something is a best practice in the absence of an authoritative code like the Canada building code to turn to.

DR. GILLILAND: Well, in our team's – just speaking to this specifically – in my team's experience – and so that's largely Evelyn Porter's experience, but also the other people including myself – there – it is standard to attend all sites at some point leading up to construction.

MR. SIMMONS: Okay. So now –

DR. GILLILAND: So is that a best practice? To me, it's one and the same when it's – when an – all – when it –

MR. SIMMONS: Okay.

DR. GILLILAND: When it consistently happens –

MR. SIMMONS: Yeah.

DR. GILLILAND: – it's certainly standard or above.

MR. SIMMONS: Okay. So if we don't have a code to refer to –

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: – you're saying that if it's a universally accepted practice, you'd regard it as a best practice that should be conformed to?

DR. GILLILAND: Right.

MR. SIMMONS: I'm right there? Now – well, let's take this example here. So this is transmission line tower sites.

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: So you, yourself, haven't worked on building transmission lines. So do you have any personal knowledge of what the universally accepted practices are for geotechnical investigations of transmission line power sites – transmission line tower sites?

DR. GILLILAND: Just based on – because I know I have limited experience –

MR. SIMMONS: Yes.

DR. GILLILAND: – my limited experience –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – has been consistent with this, but I would not be an authority to decide if –

MR. SIMMONS: Okay.

DR. GILLILAND: – if this is best practice.

MR. SIMMONS: So you're deferring to Ms. –

DR. GILLILAND: Evelyn Porter.

MR. SIMMONS: – Porter –

DR. GILLILAND: Right.

MR. SIMMONS: – on this. And has she worked in power – in transmission line construction?

DR. GILLILAND: I believe so, yeah.

MR. SIMMONS: (Inaudible.)

DR. GILLILAND: I guess the short answer is, yes, sorry.

MR. SIMMONS: Okay, so describe to me again what her experience is in transmission line construction?

DR. GILLILAND: Specifically – no, you know what, I think I wasn't – didn't quite get that right. I'm talking about communication transmission towers –

MR. SIMMONS: Okay.

DR. GILLILAND: – which is not the same as power transmission.

MR. SIMMONS: Communication towers are kind of one-offs. Around here we see them on the hilltops as one tower with guide wires and so on.

DR. GILLILAND: No, there's strings of them.

MR. SIMMONS: Strings of them –

DR. GILLILAND: Yeah.

MR. SIMMONS: – but they might be kilometres apart.

DR. GILLILAND: Potentially.

MR. SIMMONS: Okay.

So specifically transmission lines, now you've made the statement here: Best practice is. That's a very authoritative, strong statement.

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: And I'm having trouble with that because I – you're not pointing me to a code –

DR. GILLILAND: Right.

MR. SIMMONS: – that says it has to be done that way. You don't have experience with it; I don't think anyone on your team has any real experience with it. Did your team do investigation to find out what the universal practice or standard practice is among those who construct transmission lines before making this statement?

DR. GILLILAND: No.

MR. SIMMONS: How did you decide that this is a best practice?

DR. GILLILAND: In that most of the team's experience, there has not been a project that did not – where there were isolated foundations required at whatever spacing, that they didn't do an investigation of every single location.

MR. SIMMONS: Okay.

Have they ever done – has any of those projects had more than 3,000 tower sites?

DR. GILLILAND: No.

MR. SIMMONS: More than a hundred tower sites?

DR. GILLILAND: Possibly, I don't know –

MR. SIMMONS: No.

DR. GILLILAND: – the extent of Evelyn's experience.

MR. SIMMONS: See, I'm going to suggest to you that in order to provide an opinion on best practice in transmission line construction you would have needed someone who had real experience and knowledge about transmission line construction. Is that an unreasonable expectation for me to have?

DR. GILLILAND: I would expect so, yes.

MR. SIMMONS: Okay, all right.

Just a general question on the preparation of your report. I noticed that sometimes we see reports from experts where it's important to identify what the source of the factual assumptions are – the facts that are relied upon and, also, what the references are to authoritative sources like articles and codes and stuff. And we typically see those footnoted all the way through.

So when we've got a statement like the one you made there, there'd be a footnote and cross-reference to where we look to find the support for it. You haven't done that in this report so is there any particular reason why you haven't provided that type of cross-referencing so that we know the factual sources for the statements that are made in your report?

DR. GILLILAND: Grant Thornton gave us that – gave us an option of doing that, for sure.

MR. SIMMONS: Yes.

DR. GILLILAND: But they suggested the approach that we took was also reasonable, which was grouping our comments according to

the document that the comment referred to, and the appendix method as well.

MR. SIMMONS: Okay. All right.

Just a couple of questions for you about comments on the preparation of the estimate that was used at DG3 at sanction for the project as a whole.

Did you have access to the complete estimate package prepared by SNC-Lavalin?

DR. GILLILAND: Excuse me. If it's not one of the documents on the list, I guess the answer would be no.

MR. SIMMONS: It'd be a – I think it'd be a pretty big –

DR. GILLILAND: Yeah.

MR. SIMMONS: – you know, thousands of line –

DR. GILLILAND: Yeah.

MR. SIMMONS: – items.

DR. GILLILAND: No.

MR. SIMMONS: Is that part – was that part of your review, to actually review that – we've heard of it called the base estimate.

DR. GILLILAND: Okay.

Not – no. I guess the short answer would be, no, it doesn't sound like a document –

MR. SIMMONS: (Inaudible).

DR. GILLILAND: – that was in the package that I would've looked at.

MR. SIMMONS: So would you know whether there were any allowances built into the base estimate?

DR. GILLILAND: Do we know? No, we do not.

MR. SIMMONS: Now, at – at part of the DG3 estimate, the sanction estimate, the $6.2 billion – I mean, we've heard lots of evidence to know that there was a contingency amount included within that estimate.

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: And that contingency amount was in addition to the base estimate.

Is that what you understand –

DR. GILLILAND: Right.

MR. SIMMONS: – to be the case? Okay.

And in the course of your review, did you review how that – you reviewed how that contingency amount was arrived at, I believe, did you?

DR. GILLILAND: Yes. I guess the short answer is yes. The longer answer, of course, is that it evolved, right, and –

MR. SIMMONS: Yes.

DR. GILLILAND: – and how – yeah.

MR. SIMMONS: Okay. Well, I'll give you just a short description of what I understand some of the basics were that led to the, you know, $3.68-million contingency figure, whatever it was. There had been a risk workshop that was conducted, that was –

DR. GILLILAND: Right.

MR. SIMMONS: – facilitated by Westney. You've seen their reports.

Were you familiar with the Westney organization before doing this work?

DR. GILLILAND: I think I'd heard of it before.

MR. SIMMONS: Heard of them.

Had you ever done any work with them –

DR. GILLILAND: No.

MR. SIMMONS: – or on any projects where they were involved in doing risk assessment or analysis?

DR. GILLILAND: No.

MR. SIMMONS: Okay.

So there was a risk workshop facilitated by Westney, and then there were risk ranges developed, and then Westney ran the Monte Carlo.

DR. GILLILAND: Right.

MR. SIMMONS: So that sounds familiar with your conception of it?

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: Okay.

And if I understand correctly, you yourself have only been involved in a Monte Carlo analysis as part of your Ph.D. work and not on any particular project.

DR. GILLILAND: Right.

MR. SIMMONS: Right.

So you're not offering any critique of whether the Monte Carlo was run right or wrong?

DR. GILLILAND: No, that's correct.

MR. SIMMONS: Okay.

And what about the risk ranges that were developed and that were input into it? Did you evaluate those risk ranges for reasonableness or do you have any opinion on them?

DR. GILLILAND: I think the only that I looked at specifically was the concrete placement duration, which was – there was a range of 800. Eight hundred was the assumed production, and then it was – on the low end, it would be 600, and the high end would be 1,100, roughly, if I remember correctly.

MR. SIMMONS: So you did look at that one and you didn't –

DR. GILLILAND: Yeah.

MR. SIMMONS: – look at any of the others.

DR. GILLILAND: No.

MR. SIMMONS: Okay.

So have you got any critique or – are you offering any critique or analysis of the results of that risk analysis that resulted in the contingency figure of $368 million?

DR. GILLILAND: No, I don't because I didn't – I wasn't directly involved in it. The issues I raised in the report are commentary around what important factors to remember and to be thinking about.

MR. SIMMONS: Right.

DR. GILLILAND: And it was not a critique of what was actually done.

MR. SIMMONS: Right.

So you've identified factors that you consider important to consider, but you haven't looked at whether they were appropriately considered in this case or not?

DR. GILLILAND: Right.

MR. SIMMONS: Now, you did make the point that, in your view, once you go through that risk analysis process and develop a range of P25 to P75, that it – that the range should be communicated not just the P50 midpoint value.

DR. GILLILAND: Right.

MR. SIMMONS: Right.

So my question is though – for developing a budget, I have difficulty picturing how you develop a budget with a range in the budget. It seems to me that you got to pick a number to put in, in a budget. So in practice, what is the practice in the industry for what you take out of that range and put in your budget?

DR. GILLILAND: Well, there – honestly, I don't think there is a – one hard and fast rule.

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: I think if the context is provided around why the decision was made –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – I think, whatever logical process is reasonable.

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: Yeah.

MR. SIMMONS: But you do have to pick a number for the (inaudible) –

DR. GILLILAND: You do have to pick a number, no doubt about it.

MR. SIMMONS: Okay. If we can to page 12 of the report, please. It should be the report that you have opened there. Scroll down.

This was the part where you were dealing with – this is in section 2.0, and you described first the project controls plan, and a few days – a few pages later, you went to the Basis of Estimate document. And these were two of a fairly large number of project documents, I think, that you probably had available to you.

Now, I was just interested as to why you started with project controls plan – I'll tell you why – because my understanding is – and I may be wrong – that the Basis of Estimate document was the primary document that described how the estimate at DG3, at sanction, was to be prepared and that this one, the project controls plan, is primarily for monitoring performance to budget and other things after the construction of the project starts. Now, I'm just curious as to whether you understood that difference between those two documents in that way?

DR. GILLILAND: I'm not sure that I would have considered it relevant to the review of the documents themselves.

MR. SIMMONS: Okay.

Did you look at any of the risk registers that were developed for the project?

DR. GILLILAND: In the summary I did, yes.

MR. SIMMONS: Okay.

You're aware there was a series of risk registers prior to sanction?

DR. GILLILAND: Yes.

MR. SIMMONS: Did you track them after sanction to see what happened with the risk registers after?

DR. GILLILAND: I did not.

MR. SIMMONS: Do you know if there are risk registers for individual work packages?

DR. GILLILAND: I do not.

MR. SIMMONS: We can go to page 16, please? Scroll down. Thank you.

So this is section 3.0, the Temporary Enclosure, and this is what we've referred to as the ICS or the integrated cover system. You've given some evidence on that this morning. Did you have the opportunity to hear the evidence last week from Mr. Argirov, who was Canada's independent engineer on the project?

DR. GILLILAND: No, I did not.

MR. SIMMONS: Okay. All right.

So I'll – one proposition I'll put to you is that the integrated cover system itself is a steel building, is a fairly straightforward piece of construction. You're nodding your head.

DR. GILLILAND: Yes, it is. Yeah.

MR. SIMMONS: You agree with that?

DR. GILLILAND: Yeah.

MR. SIMMONS: It's a foundation to put steel posts on. Put up the steel posts and some braces and steel beams on the roof and cover it in cladding, and it's not a lot more – the building itself is not a lot more complicated than that, is it?

DR. GILLILAND: I guess, for this example, I'll go with that.

MR. SIMMONS: Yeah. Okay.

So how does it – what difference does it make, you know, what the relative size of it is? Once you get up to a certain size, does the size of this one make a difference when it comes to the actual erection and construction of the structure? Obviously it'll take some more material and some more time to do it but, conceptually, is it any different?

DR. GILLILAND: I would say so in this case because if it was a small structure, you would not have interior columns –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – to worry about, which – and it would – which would potentially interfere with the – what you're trying build –

MR. SIMMONS: Yeah.

DR. GILLILAND: – as well as other material conveying systems like cranes or that sort of thing – or the flow of things inside.

MR. SIMMONS: Okay.

DR. GILLILAND: The size would also impact the heating requirements or the – or, you know, the ability to keep a structure –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – interior, rather, of the building warm –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – to the right temperature. That can be quite daunting, I guess, in a very large structure like – certainly like this one, I would think. What other things would have mattered? The foundations become that much more complicated, and certainly the fact that you're trying to weave this through the powerhouse structure in this example is very challenging –

MR. SIMMONS: Okay.

DR. GILLILAND: – as a coordination issue. And I would say that in a very common situation, the size and elevation, if you will, and the standard layout of the building would be very straightforward, whereas this was spanning between very different elevations with a much – with a very large hole in the middle. It's geometrically challenging.

MR. SIMMONS: Right. So there were some complications compared to a basic warehouse, for example.

DR. GILLILAND: I think that's understating the –

MR. SIMMONS: Yeah, okay. And one of the things that's – you mentioned in your report a couple of times and which you've corrected here this morning –

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: – was that in your report you have presumed that all the concrete that had to be moved – which is the main point, the building is there is for placing concrete – would have to be moved by buckets transferred among the various cranes in the building. So that was the assumption under which your report was written, correct?

DR. GILLILAND: Initially, yes.

MR. SIMMONS: Yes, okay.

Now, Ms. O'Brien brought you to the – to a document this morning, for which I believe you had when you prepared the report –

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: – which had the schematic diagrams that showed the basic layout for the ICS and very clearly showed concrete pumps, a pumping system for –

DR. GILLILAND: Right.

MR. SIMMONS: – moving concrete.

So had that document been reviewed – and was your team aware of that when the report was written?

DR. GILLILAND: Oh, absolutely. It was – there was no doubt that this concrete would be pumped. The question was how it would get to the pumps. So the red lines were honestly a little – well, they were ambiguous. And to me it still remains unclear –

MR. SIMMONS: Okay.

DR. GILLILAND: – as to how that works specifically.

MR. SIMMONS: So –

DR. GILLILAND: So the use of buckets for concrete, while not relied on completely, would still be – could conceivably still be used for placing some concrete.

I don't think that's a problem by the way. I mean, it just is what it is.

MR. SIMMONS: In your report, I thought you clearly – fairly clearly stated that the concrete was going to be moved by cranes. So –

DR. GILLILAND: At one point, you're right. It's on page 17.

MR. SIMMONS: Right.

DR. GILLILAND: Moving concrete by bucket to concrete pumps.

MR. SIMMONS: Right.

DR. GILLILAND: Right.

MR. SIMMONS: And that you only learned yesterday that it was going to be – that it was a pumping system rather than cranes. I mean, that's the evidence I heard this morning. Is that correct?

DR. GILLILAND: Oh, timing-wise I'm not certain if I knew it prior to that or not.

MR. SIMMONS: Okay. So have you or anyone on your team reconsidered the analysis in your report based on the difference between moving the concrete by buckets and cranes versus the pumping system that was actually intended to be used?

DR. GILLILAND: I have considered, and I wouldn't – I'm not changing my position on it.

MR. SIMMONS: All right. And that consideration, when did you do that? Has that only been in the last day or so?

DR. GILLILAND: Yeah. Definitively, yeah. I took – definitely took a closer look at it, for sure, yesterday.

MR. SIMMONS: Okay.

DR. GILLILAND: And – yeah.

MR. SIMMONS: Thank you.

So you raised some issues about the need to coordinate this design of the ICS to make sure that it didn't interfere with the actual design of the powerhouse and so on, and the need to coordinate with the designers, SNC-Lavalin. Do you know what actually happened on the site with that? Do you know what coordination there was or how that was handled?

DR. GILLILAND: Just by referring to the comments in some of the construction meeting minutes and the duration of time that efforts were under way –

MR. SIMMONS: Right.

DR. GILLILAND: – and the number of people that were involved.

MR. SIMMONS: Okay.

And had you done any more extensive investigation of that or –

DR. GILLILAND: No.

MR. SIMMONS: – obviously you haven't spoken to anybody concerning it.

DR. GILLILAND: (Inaudible.)

MR. SIMMONS: Did you have any inquiries that you passed on to Grant Thornton on that issue?

DR. GILLILAND: No, I didn't think it was necessary.

MR. SIMMONS: Okay.

Excuse me for one moment, Commissioner.

THE COMMISSIONER: Take your time.

MR. SIMMONS: Too many loose pieces of paper today.

Okay, if we can go to the report, page 18, please.

Now, this is the start of where Ms. O'Brien dealt with section 4, Contract Structure, section 5, Work Package Sizes, and section 6, Project Management Structure with you.

DR. GILLILAND: Mm-hmm.

MR. SIMMONS: Now, I'll admit that when I read section 4 I was a bit unclear as to what it was that you were addressing here. And when you say contract structure, is this discussion meant to be limited to the contract management structure or to the overall structure of contracting for the construction of the entire Lower Churchill Project?

DR. GILLILAND: Yes, it's a very – it's a general topic of contract structure, so I think to be fair there's probably a point made on either – on both of those. So, for example, a point about the construction contracts themselves and the interaction between them.

MR. SIMMONS: Okay. That would be the Work Package –

DR. GILLILAND: Work Package.

MR. SIMMONS: – section 5, is it? So if we –

DR. GILLILAND: No, no, under – there is, you're right, there is overlap between the three so it's hard to split them apart sometimes.

MR. SIMMONS: Okay.

Well, let me – in section 4 – paragraph one in section 4 says: "At DG3 budget estimate stage … it appears that the project was planned assuming that an EPCM contract format would be followed. Instead, Nalcor provided the project management function for the project …" – all clear.

You go down to the third paragraph and it says: "Not retaining one general contractor to oversee and control all scopes of work …." Now, when I read this, I was unclear whether you were equating the EPCM contract to one general contractor for performance of the work. That's not what you intended here, is it?

DR. GILLILAND: No, they're not the same thing.

MR. SIMMONS: So these are – even though this is under one heading, these are two entirely separate topics.

DR. GILLILAND: Right.

MR. SIMMONS: Okay.

Section 5, then, dealing with Work Package Sizes. The second paragraph: "Best practice" – again – "on large projects in remote locations is to provide large work packages."

So the first question is – large is a very general, you know, not very clearly defined term. In the context of a large hydroelectric development, with several aspects like this one, how does this concept of large package sizes apply? What are you thinking about when you say a package that is large versus a package that isn't?

DR. GILLILAND: How large is large?

MR. SIMMONS: That's – yeah. That's right.

DR. GILLILAND: Yeah, that's –

MR. SIMMONS: Well, we have to know –

DR. GILLILAND: Right.

MR. SIMMONS: – to be able to assess it.

DR. GILLILAND: You know, it varies depending on what component of the work you're talking about as –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – to what large would become.

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: A large concrete structure should be built by one contractor, as an example, but the turbines themselves would be provided by a different supplier.

MR. SIMMONS: Did –

DR. GILLILAND: You wouldn't package the two together.

MR. SIMMONS: Did you review the work package breakdown for the Lower Churchill Project? And when I say Lower Churchill Project, I'm not just talking about the powerhouse, I'm talking about the whole project. Did you review the work package structure for the project?

DR. GILLILAND: Not in detail, no.

MR. SIMMONS: Did you review it at all?

DR. GILLILAND: Just in a summary review of it: looked through to get a general feel for it.

MR. SIMMONS: Hmm. Did you do any assessment to see whether the work packages were appropriately divided up for the nature of the work and the size of the work packages?

DR. GILLILAND: In my opinion, it would be – it seemed reasonable.

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: But, honestly, that's not my area of expertise to make that definitive statement.

MR. SIMMONS: So this is one of these sections here where we can take your statements as being statements of general principle –

DR. GILLILAND: Right.

MR. SIMMONS: – without any analysis as to how they apply to this project.

DR. GILLILAND: Highlighting important factors and to be considered, yes.

MR. SIMMONS: Okay.

If we go over, though, to the next page, please, page 19. We can stop there.

The second full paragraph on that page begins: "The work packages used at Muskrat Falls are logical for an EPCM contract format." And I was wondering why the reference to EPCM contract format. How are you equating EPCM contract format to the size of the work packages? And, then, secondary question is: Did the change to integrated project team have any effect on whether those work packages were appropriately sized?

DR. GILLILAND: Well, the work packages were created when it was an EPCM –

MR. SIMMONS: Right.

DR. GILLILAND: – arrangement.

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: So that's simply a statement. And in terms of when – after the change would they need to restructure those packages, maybe, maybe not. And it was simply a cautionary – again, a cautionary note to consider that, what the implications might be.

MR. SIMMONS: Mm-hmm.

Okay.

So concerning the change from SNC as EPCM contractor to the integrated project management team, one of the things that you had mentioned this morning, I understood to be that an EPCM contractor could have some commercial incentives to control cost on the project that I gathered you – you considered might not apply to an integrated project management team. Did I have that right?

DR. GILLILAND: Yes.

MR. SIMMONS: Okay.

So did you review the SNC EPCM contract?

DR. GILLILAND: No.

MR. SIMMONS: Do you know whether the SNC had any commercial incentives of the type

you were thinking about that would have been preferable to the arrangement that was implemented with the integrated project team?

DR. GILLILAND: I do not know.

MR. SIMMONS: You do not know. Okay.

Are – did your analysis – did you, in your work, find any evidence or indication of any impact on cost or schedule as a result of the change from EPCM to integrated project team?

DR. GILLILAND: No, we weren't looking for that specifically –

MR. SIMMONS: Right.

DR. GILLILAND: – and we didn't dive into the level of detail–

MR. SIMMONS: Right.

DR. GILLILAND: – nor have all the documents that we would need to do something –

MR. SIMMONS: Right.

DR. GILLILAND: – like that.

MR. SIMMONS: Did you look at the events that led to the change to determine why it had been made?

DR. GILLILAND: No, we did not.

MR. SIMMONS: Okay.

There's – you made some mention also this morning of the importance of having a strong project management team on the site. Have you done any analysis of what the on-site management team has been for this project?

DR. GILLILAND: No, I did not.

MR. SIMMONS: And if we scroll down this page, I think, we'll – no, a little further – page 20, please, Madam Clerk. On page 20 you deal with the section "Productivity Factors." And really the only thing I wanted to ask you about here was – and I can bring you to it if you need to – there's discussion in this section of the impact of labour shortages as being a fairly significant contributor to the calculation of the expected productivity on site.

So what is your understanding of whether, in fact, there turned out to be any shortage of trade labour for this project?

DR. GILLILAND: My understanding. I didn't look into that specific topic in any detail.

MR. SIMMONS: Right. So do you know whether that risk materialized or not?

DR. GILLILAND: Only by reading anecdotally and inferring from other things that we did look at, but not specifically –

MR. SIMMONS: Okay.

DR. GILLILAND: – as direct research. No.

MR. SIMMONS: The schedule section begins on page 26. Can we go to page 27, please, and to the bottom of page 27?

So there's a – in section 8.2 your – it's headed "Recommendation for Award Summary Report." I think this was the one for the CH0007 contract awarded to Astaldi. And in the second sentence there you say: "The original schedule dates indicate that the Astaldi contract was to be awarded in July 2013, but award was delayed until late … 2013. This resulted in delayed mobilization and lost opportunity to prepare the site before the onset of winter."

Now, in the document list that you've provided for the documents you had, I believe included in there is a document we've been referring to as the LNTP, or limited notice to proceed, that was given to Astaldi in September of 2013. So in making this statement here did you consider the effect of that arrangement?

DR. GILLILAND: Not in specific detail but it was a limited notice to proceed.

MR. SIMMONS: Right.

DR. GILLILAND: So had hundred per cent award been completed they would have had free rein to –

MR. SIMMONS: So did you look at –

DR. GILLILAND: – (inaudible).

MR. SIMMONS: – what was authorized in the limited notice to proceed?

DR. GILLILAND: Not in – not in great detail. No.

MR. SIMMONS: Okay. Do you know if mobilization was authorized?

DR. GILLILAND: They were certainly at the site and I believe they were even looking at the Integrated Cover Structure –

MR. SIMMONS: Right.

DR. GILLILAND: – preliminary to see how that would start to work –

MR. SIMMONS: Mm-hmm.

DR. GILLILAND: – but beyond that, no.

MR. SIMMONS: Okay.

On page 28, please, at the bottom, Ms. O'Brien has already asked you about a number of things through here that I don't need to cover. This – on the bottom of this page, this paragraph, the last sentence is: "Regardless of the ICS, SLI" – SNC-Lavalin International – "did not believe that the required concrete placement schedule was achievable …." Now, I'm wondering what your source was for that statement?

DR. GILLILAND: It's an email that was circulated and it is in production somewhere in the documents.

MR. SIMMONS: Okay, so we should –

DR. GILLILAND: (Inaudible) email from (inaudible).

MR. SIMMONS: We should be able to find it in the list of documents that you've referred to?

DR. GILLILAND: Right.

MR. SIMMONS: Okay.

Okay, thank you very much, Dr. Gilliland.

I don't have any other questions for you.

THE COMMISSIONER: All right, thank you.

Concerned Citizens Coalition?

MR. HISCOCK: Good morning, Doctor.

DR. GILLILAND: Good morning.

MR. HISCOCK: My name is Will Hiscock and I'm with the Concerned Citizens Coalition. I have a few questions for you there today.

I'd like to start near the end of your report, if I could take you to page 35, and that's Exhibit 01678. And on page 35, this is where you speak – near the bottom I believe – of dams and spillways, and then in section 10, of the reservoir rim and spur stabilization.

In section 10, you begin, "'Introduction' begins by stating that previous engineering studies have identified landslide activity along the Spur and" – this is – "a significant problem to development of the site. The south end of the spur (narrow end where the Generating station is situated) has been narrowed by landslide activity. In 1982, a network of 22 pump wells was installed on the Spur to lower the groundwater table to prevent continued slope regression due to landslide activity."

My question for you is: How would you increase the level of confidence in safety in securing the North Spur? Is that something you've considered?

DR. GILLILAND: Oh, I'm not sure that I certainly didn't look into that in any detail in terms of alternatives for dealing with that issue.

MR. HISCOCK: Okay.

I'd like to speak to you next on the topic of risk and the P-factors that you've noted. Westney has given evidence in this matter. Are you aware of what P-factor Westney recommended to Nalcor?

DR. GILLILAND: I believe it was the – or you mean the range, the P25 to P75 or – yeah, but in

the Nalcor management plan they were initially considering a P10 to P90 range.

MR. HISCOCK: Okay.

Is there a specific P-factor – because I think Nalcor, at the end of the day, settled on a P50. Is there a P-factor that you think is appropriate for the tactical risk anyways, of this project?

DR. GILLILAND: I think it's – picking one number is hard. I recognize there needs to be one number and the P50 is a reasonable number to pick, as long as context is provided in addition to the contingency.

MR. HISCOCK: Do you have any views on the strategic risk or the P-factor regarding strategic risk?

DR. GILLILAND: No, I don't have any commentary on that.

MR. HISCOCK: Westney testified in November 16 that more than three identified risks should have been included.

I would like to take you to Exhibit 00130.

DR. GILLILAND: What – do you know what the tab number is?

THE COMMISSIONER: It's probably not in your book –

MR. HISCOCK: Okay.

THE COMMISSIONER: – I don't think.

MR. HISCOCK: It may not be. It may just have to come up on the screen there.

THE COMMISSIONER: Actually –

MR. HISCOCK: And if we –

THE COMMISSIONER: – it is at tab 11.

MR. HISCOCK: And if we –

DR. GILLILAND: Eleven?

MR. HISCOCK: Oh, and page 287.

THE COMMISSIONER: Actually, it's only the first page, so you're going to have to look at the screen.

MR. HISCOCK: Okay.

DR. GILLILAND: Okay.

MR. HISCOCK: I apologize. I don't know what's in your documents.

DR. GILLILAND: No, that's fine.

MR. HISCOCK: On page 287 we see the risks there. Do you think that that limited group of risks identified in there, is that appropriate in your mind?

DR. GILLILAND: So you're asking me about these dollar values?

MR. HISCOCK: Well, and –

DR. GILLILAND: If they're reasonable?

MR. HISCOCK: – should there be more risks included there? Does that seem like a reasonable list of risks, risk factors?

DR. GILLILAND: Okay, I just need to have – just digest what it is I'm looking at here.

Potentials, strategic risk exposure – so this is strategic risk. And I'm – I was concerned primarily with the project or tactical risk items. So having said that, we – I have discussed productivity issues and the – but not the completion bonus or the wage rate.

So in terms of the – you know, there are many, many risks, I suppose, and so perhaps these are the top four that were identified –

MR. HISCOCK: Mm-hmm.

DR. GILLILAND: – as being most significant to the simulation. And it's difficult to tell just based – looking at this one chart.

MR. HISCOCK: We have another exhibit I'd like to take you to. Now, this is 01977 – Exhibit 01977 – and it is an SNC risk registry. And that document, in 01977, that's a very extensive list. And if we could just scan – perhaps we can

slowly move down through it here. But we see a long list – basically most of this document is a list of risks and we'll move down through them there.

And so they're dealing with a lot – I mean, suffice it to say we're about a third of the way through the document; we're dealing with a fair number of risks not identified in that first short grouping. Would that be more along what you would expect to see in a risk analysis, is a substantial number of fairly detailed risks. You know, not your top three, four, but a more nuanced, in the weeds, we'll say, risk analysis.

DR. GILLILAND: I would assume that, yeah, given the capacity and capability of the Monte Carlo simulation to include a multitude of variables, it would be underutilized if there was not more factors involved.

MR. HISCOCK: And, I mean, is there any advantage to limiting your number of risks that you're looking at, three or four or five top ones, and excluding all of the rest of risks factors there?

DR. GILLILAND: Well, that's a good question. The – I guess, academically speaking, there would be – there's an advantage to limiting the number of variables because you can isolate and identify the impact of a smaller number of variables in more detail. But it does – only having a few variables really simplifies the scenario considerably. It might overlook nuances that would be important.

MR. HISCOCK: Thank you.

On – one second now. This would be – I apologize. Page 8 of your own report – and so we're back to your main report there now. Now, on page 8 and down near the bottom of the page is paragraph 31: "Nalcor risk mitigation plans developed during planning and sanctioning phases of the project do not appear to have materialized during construction. It is not clear what processes were put in place to ensure these plans were implemented on site or in contract documents."

Is this an indication of bad risk management?

DR. GILLILAND: I think it's an indication of not having a complete set of documents more than anything. I'm not clear what – Sir, which number are we – were you reading here?

MR. HISCOCK: I was coming from paragraph 31 of your report.

DR. GILLILAND: Thirty-one, okay.

MR. HISCOCK: And you talked about the risk mitigation plans not seeming to have developed through the sanction phase and it's not clear the processes were put in place to ensure that these plans were implemented on site –

DR. GILLILAND: Right.

MR. HISCOCK: – or in the contract documents.

DR. GILLILAND: Right. So there was this – there's this risk register, and the process of tracking this risk and how it was dealt with through the course of the design and construction is not clear to me. I don't – didn't have – I wasn't doing a detailed sort of forensic at that level for a particular issue, nor do I have all the documents that I would need to do that.

MR. HISCOCK: Fair enough, Doctor.

How should risk have been managed to ensure that risks which had been eliminated were actually addressed on the ground as was intended in the risk management stage?

DR. GILLILAND: Well, there's different ways of eliminating a risk. One would be during the design phase where an issue is identified – I'm trying to think of an example. Where the – where it's – let's just pick something trivial, like the size of the turbine that would be in the powerhouse. And you can – that's a question initially, until you've picked – you actually picked the unit itself. And so the design of the structure, the concrete structure in that powerhouse itself, must accommodate – must be able to accommodate whatever the final turbine looks like and shape and size of it.

So once that turbine is selected, the design risk disappears because you can go circle back to the design and ensure that it's taken care of.

MR. HISCOCK: Right.

DR. GILLILAND: So other risks cannot be mitigated until construction and at certain stages of construction. So, for example, the bottom excavation and confirming the bearing capacity, suitability of the excavation bearing surface to accommodate the concrete powerhouse, you won't know that exact elevation until you get to the bottom of the hole and confirm that the soil or the bedrock is in suitable condition.

MR. HISCOCK: Okay.

So that would be the – the process would vary depending on the risk, but it would be expected that whatever risk factors were identified and the plans were put in place, they need to be followed on the ground, many of them anyways, that can't be dealt with simply at the design phase.

DR. GILLILAND: Right. Yeah, so –

MR. HISCOCK: It would have to be implemented on the ground by the project management team? Would that be who you would expect to be following that chain from the initial planning to mitigate a risk through to the completion on the ground?

DR. GILLILAND: Correct.

MR. HISCOCK: Okay.

DR. GILLILAND: Yeah. And yeah, sorry, I didn't finish my thought.

MR. HISCOCK: Sorry, I (inaudible) –

DR. GILLILAND: You were right to follow that through because the – it is the project manager – the project management team to follow the risks from the beginning to ensure they're addressed appropriately through the course of the project.

MR. HISCOCK: Okay.

I'm gonna – I seem to be working backwards through your report here as to the way the questions have fallen, but if we could step back a couple of pages to page 6 on the PDF. And paragraph 14 is the one I'm looking at here. And you state, in part, halfway down through that:

"To be successful under these conditions requires exceptional control over activities on site, as well as strong contracts with incentives and penalties within each contract to align each contractor's behaviour with overall project objectives."

From what you've seen, did Nalcor use sufficient incentives and penalties here?

DR. GILLILAND: I would say that's not in my area of expertise to comment on.

MR. HISCOCK: Okay.

It is my understanding that Tim Harrington has testified that Cahill-Ganotec project relied heavily on incentives and penalties. Did you see any sign when you were looking at this that Nalcor was learning kind of on the job how to build in strong incentives and penalties into their contracts?

DR. GILLILAND: I wasn't looking for that –

MR. HISCOCK: Okay.

DR. GILLILAND: – type of information.

MR. HISCOCK: I'd like to go to paragraph – well, sorry, to page 8 of the PDF, paragraph 27.

Here you note that: "The impact of weather was not considered holistically when the project schedule was developed. Civil construction is commonly assumed to stop during winter months. Attempting to continue outdoor construction through the winter season is typically uneconomic when time is typically better spent planning and optimizing processes for the following … construction season."

Do you believe a more sophisticated local owner ought to have known that the winter work was not economical here?

DR. GILLILAND: I think everybody understood that winter construction was challenging, which is why the Integrated Cover Structure was proposed. And certainly the Salini bid, where they were – there was no cover structure of this type, they were not attempting – they were not – certainly not attempting to build

or construct during the winter. So I think it was relatively common knowledge.

The extent to which it was programed into schedule and – in terms of stops and starts and the consideration – there were – I guess the reason for the comment in the first place was that there were – there was references through the planning process to when the contract should be awarded to take advantage of the construction season and the cycles of construction related to weather and seasons. But it – there was – the conversation around that scheduling didn't carry through into the construction phase once – at least there's no evidence of that as part of my review.

MR. HISCOCK: If we go to page 13 of your report, there's a section there which has been brought to your attention previously. "The adopted maturity model indicates that the level of completeness required for the DG3 sanctioning milestone is a Class 3 estimate based on 10-25% engineering completed, requiring a 10-15% contingency. At the DG3 milestone for the Muskrat Falls Project, a contingency of 7% was used, which corresponds to a level of 80-100% engineering design completeness and does not align with the expectations of the Nalcor controls plan."

Do you – what do you understand to be the expectation, or to have been the expectation, at financial close. Do you know what that would have been there?

DR. GILLILAND: Financial close was not the same as DG3, I am –

MR. HISCOCK: No.

DR. GILLILAND: – aware of that, so I'm not certain what the circumstance was at that time.

MR. HISCOCK: Okay.

Were the estimates expected to be a more – at a more advanced stage of development at that point, do you think?

DR. GILLILAND: Well, from what we've talked about today, the extent of engineering documentation was deemed to be 40 to 45 per cent complete, which was more than what was required by DG3. But that doesn't necessarily reflect back to how the risks on the risk register would have been addressed.

MR. HISCOCK: What contingency would have been expected? If not 7 per cent, what per cent should have been used there, do you believe?

DR. GILLILAND: It's a – the contingency should be set in context to the risks that were still currently unaddressed on the risk register, together with – because those are ultimately – it's a known risk so, therefore, you can attempt to quantify it in some way. And so a contingency would be over and above that to account for things that are completely unforeseen at this – at that point.

So a lot of these risks are lumped into a contingency, and they just use one large number to account for all of these factors that are undefined, even though they may be identified. So you have to interpret what the contingency number was. Seven per cent may have been a reasonable number for things that were just simply not – that no one had even considered provided that – but if it needed to include allowances or factor allowances or dollars and schedule allowance for risks that were already know – known, rather – if they were also lumped in at this stage, then 7 per cent might not have been enough.

MR. HISCOCK: I'd like to take you to the next page, to page 14 of your document there. You state in the last paragraph: "The Basis of Estimate document outlines how the budget estimate was determined. It should be highlighted that the estimate is assembled based on the assumption that the project would be performed under an Engineer, Procure, Construct, and Manage (EPCM) contract on behalf of the Owner. This form of contract was not used by Nalcor to deliver this project."

So I guess my question is, how should the budget estimate be determined for an integrated project approach?

DR. GILLILAND: I'm not certain that I would – am totally qualified to answer that question.

MR. HISCOCK: Okay.

DR. GILLILAND: But the point I would make is that during – as I made earlier – which is transitioning from one system to another requires careful management of information and knowledge that could be to the detriment of the new system if all of the information is not tracked and acted on.

MR. HISCOCK: Would you be able to speak, perhaps, to some – any of the main or some of the main differences and how an estimate preparation should be undertaken between these two approaches using the EPCM model or the joint model?

DR. GILLILAND: Well, in an EPCM model, the EPCM lead is responsible for it, and the owner would not typically be involved at all in terms of the details but could be – would be consulted in any case. And in an integrated team approach – sorry, an EPCM, the design component is also included in – as part of the same package by the same EPCM provider. So there's – that piece is integrated. Whereas in the integrated team approach, all these factors are separated as independent entities.

MR. HISCOCK: Do you feel that there should have been a new or, at least, a reviewed budget at the time that the approach was changed to give up on the EPCM model?

DR. GILLILAND: I'm not sure that it would correlate.

MR. HISCOCK: On page 15 – if we could turn to page 15. And there's a number of bullets there. I'm looking at the last bullet. Here you're speaking of project memory, and we've spoken on this point earlier today. Does the use of contractors rather than of staff affect project memory? Of contract staff, rather – you know, of hired contractors rather than their – your own internal staff affect project memory.

DR. GILLILAND: Contract staff versus full staff – it's sometimes one in the same for a lot of these large projects, megaprojects. People staff up and contractors or EPCMs staff up to service a particular project and in that sense they're hired on contract just to deliver a project. It's – they would still function in the same capacity as a staff member would.

MR. HISCOCK: Okay.

In your report you speak of re-baselining. Could you just briefly explain what a re-baselining is, I guess? What that term means.

DR. GILLILAND: Sure. Well, in the context of – in this specific –

MR. HISCOCK: Yes.

DR. GILLILAND: – example of what happened it was a re-evaluation of the budget as well as a re-evaluation of the schedule that occurred in 2016. Then there was – I think there were several other occasions. Anyway, the schedule and the baseline information that everything was measured against was reset. So – in all the documentation, it reflected these revised numbers.

MR. HISCOCK: Can re-baselining potentially mislead people as to the true size of a total change in the project like this over time?

DR. GILLILAND: It can – I mean the number is the number at that given time, so that's not misleading. But the – as I think I mentioned earlier in my testimony as well, it does make it difficult to assess the full story or narrative for the project when you have to review to multiple documents to get – to see the trend, the evolution of a number.

MR. HISCOCK: One second there, if you could. Your report refers to updated contingency allowances, and I'm thinking particularly on page 16 you refer to updated contingency allowances. Are you referring – when you're referring to updated contingency allowances, are you referring to updating expenditure estimates or adjusting the allowances to reflect new information?

DR. GILLILAND: Which sentence do you mean specifically here?

MR. HISCOCK: I'm sorry, I'm going to have to – I will have to flick through it to find the page, one moment.

MS. O'BRIEN: Could be the last paragraph on (inaudible).

MR. HISCOCK: Yes.

Contingency drawdowns do "not seem to change significantly from month to month. It appears that contingency is not adjusted to reflect reduced progress for costs incurred, and DAN information was not" needed to necessary – "to update the necessary contingency allowance. It is not clear how contingency measurement was used through the course of the project."

When you're referring to contingency allowance there –

DR. GILLILAND: Okay.

MR. HISCOCK: – is that about updating the expenditure estimates or are we adjusting the allowances based on new information that's coming in. I'm just curious there what you meant when you were doing that, when you say that.

DR. GILLILAND: Okay, I'll take a crack at what you're asking. The –

MR. HISCOCK: Okay.

DR. GILLILAND: In all these monthly reports there was a graph produced that showed the – what the contingency was and the changes in the contingency over time. And I wasn't certain, honestly, how those graphs were necessarily arrived at, whether they were simply to reflect PCNs for that specific scope of work or whether there was some other calculations going on. Like, it didn't line up with the overall context of the project.

MR. HISCOCK: Okay.

It's clear that the project schedule, I put it to you, for this project, assumed that the ICS would be successful. And the report prepared for Grant Thornton stated on page 5 that without it there was no weather protection and no system to move materials efficiently.

But it did fail. And it's not a case where the ICS was a victim of the weather, from what we understand. Rather, it seems to have been a failure of management; the ICS having to be torn down before it was even completed, and it was an expensive failure.

Would you agree that if a contractor can't build what is essentially a large warehouse, admittedly with significant complexities to it, that it should be a serious concern for their ability to build a megaproject; a red flag, perhaps?

DR. GILLILAND: There's a lot of moving pieces to that situation. I'm – I would only assume that everybody was acting in good faith at the time of that, and then the expertise that was identified for the project and the reason they were on the project was that they had the expertise and a variety of circumstances led to them not being able to complete it.

Would it be a red flag? It's – in the moment it's certainly, like you said, a disruptive influence, and usually the test of a team is what you do in the face of adversity as opposed to what you do in the face of success.

MR. HISCOCK: And, well, I mean, this ICS was crucial to this project's planned schedule, and it's not like they decided to cancel it before they started working on it. You know, there is – my understanding is they were putting sheet metal on the thing before they decided to tear it down again. So does that not say something about Astaldi's planning and execution skills?

DR. GILLILAND: Well, there was a lot of factors at play in terms of finalizing drawings and elevations of footings. I mean I'm just reading back to you the comments already made around some of the factors involved with the struggles they were having. Of course it would be a concern, but I'm certainly not privy to all the information that was available at the time around how these decisions were made. It could have been a concern.

MR. HISCOCK: Okay.

DR. GILLILAND: Without knowing the full context and all the information at the time, it's not possible to really pass a judgment.

MR. HISCOCK: We do know that Nalcor had a very tight schedule for this project and the ICS was crucial to it. So far, this Inquiry has brought forward no studies to indicate that Nalcor considered the risks if the ICS failed. What does the failure of the ICS say about Nalcor's readiness in this project?

DR. GILLILAND: I guess I would just defer to my same comments. It's – you know, it's part of the means and methods of construction. So it was really Astaldi's decision to continue using the ICS but, of course, in an integrated team there's people – lots of people involved in the decision-making and lots of factors to consider that I'm not – that I'm certainly not privy to. So I don't feel that I can really make a comment.

MR. HISCOCK: I'm going to put it to you that the failure to build the ICS, this large warehouse, was not just a failure of Astaldi, that the schedule relied on it, that there were questions about it and that its failure is proof of Nalcor's own incompetence. Was that not seen plain on the face of it?

They were the project – they were in charge of making sure the schedule was met. It was reliant on the ICS, we have no evidence that any plans if this ICS doesn't go through and the ICS didn't go through. Is that not incompetence?

DR. GILLILAND: I don't think I'm qualified to comment on that.

MR. HISCOCK: Okay. Is there anything Nalcor could've done to make this work? The ICS, that is.

DR. GILLILAND: Well, hindsight is always 20/20. There's always a way. I don't think it was necessarily a bad idea and it would've been great for it to be successful.

MR. HISCOCK: Do you think that there's a point earlier than when the plug was eventually pulled on this? Do you think there was a point earlier where Nalcor should have realized that this wasn't working and pulled the plug?

DR. GILLILAND: I think – and I'm not aware whether or not – I guess my only point would be: When schedule and progress falters and schedule deadlines are missed or fall by the wayside for whatever reason, contingency plans should be discussed. And I'm not aware of those conversations happening or not happening. So I can't really comment.

MR. HISCOCK: So this is – I would suggest this was an omission in the planning stage to not have a contingency for the ICS if they weren't sure that it could work. And obviously, they couldn't have been sure it was going to work, because it didn't work.

So do you not see that this is – see this as a significant failure on Nalcor's part and significant failure of judgment on their part?

DR. GILLILAND: I don't see any evidence that anybody thought it wasn't going to work. So I don't – I'm not –

MR. HISCOCK: Okay.

DR. GILLILAND: – I don't think that that's – a lot of assumption.

MR. HISCOCK: Given these omissions or planning failures, in your opinion, should Nalcor have asked for the sanction of the project when it did?

DR. GILLILAND: There's a lot of factors that go into the sanction that have – that are largely unrelated to what the details are going on on a construction site. Those sort of operational things are left to people on site to figure out. I don't think there's any connection between them.

MR. HISCOCK: Would you agree that as soon as it became evident that the ICS was a failure, that this ought to have been a clue to Nalcor to pause – pause the project and to reassess both the wisdom of continuing to work in the winter months and to reassess their schedule at that point?

DR. GILLILAND: Simply, I think – do you mean pause construction? Can shut the site down and waited to figure out plan – another plan?

MR. HISCOCK: You tell me if you think that would have been appropriate. Or what would have been appropriate under the circumstances, once the ICS has failed?

DR. GILLILAND: In my opinion, I would say: You can't stop a project like this if it's going to be completed; once you stop, it'll be very difficult to start. Again, the inertia behind such a large project is – it's overwhelming and you can't, you simply can't stop to reassess a plan. I

mean, you need to bring, typically, additional resources to bear to resolve the problems one way or the other while the project continues.

MR. HISCOCK: Evidence has been placed before this Inquiry to the effect, anyway, that Astaldi's low price weighed in its favour in being awarded this contract. And the Astaldi bid was approximately $1 billion in due – in contrast to two others of around 1.8 billion.

Should they have selected Astaldi?

DR. GILLILAND: Well, they had a process to go through for an award, and I believe they followed that process, So, I don't have a comment, that's not my area of expertise beyond that.

MR. HISCOCK: Did you assess Astaldi's construction capability to perform this contract no matter what the price?

DR. GILLILAND: I didn't assess it, no.

MR. HISCOCK: Do you have a view on Nalcor's decision to give a large weighing to the price of their contractors as opposed to the specific experience required to work productively in sub-Arctic conditions? A firm that had – basically, the price versus a firm with more direct, on-point experience, especially in that kind of environment.

DR. GILLILAND: Other than just the observation, again, that they had a process and an evaluation criteria established that they followed and – I can't comment on that any further.

MR. HISCOCK: Did you assess the experience and skills of the project management team here?

DR. GILLILAND: I did not. That was not my – within my scope.

MR. HISCOCK: Do you have a couple of more questions? Just give me one second.

How many contractors other than Astaldi would have been affected by the ICS failure? Do you have any understanding or view on that?

DR. GILLILAND: How many? I would think – I don't have a number for you but I – my understanding of – and just broad overview of the documents reviewed is that all contracts surrounding the powerhouse as well – and subsequent – after (inaudible) started during or came after were impacted.

MR. HISCOCK: So it would have had a huge knock-on effect?

DR. GILLILAND: I believe so, yes.

MR. HISCOCK: Okay.

And what efforts were made to get these other contractors' co-operation? Are you aware?

DR. GILLILAND: I'm not aware of what steps were taken.

MR. HISCOCK: What are the necessary prerequisites to making an integrated approach model successful, making that model a success?

DR. GILLILAND: What steps were taken? Is that –?

MR. HISCOCK: Well, what – in a general sense, what do you need to do to have that – be a success?

DR. GILLILAND: Well, you have – the organizational structure and the lines of responsibility and accountability for all scopes of services would absolutely need to be very clearly defined. That is through – the overarching, most important factor. In terms of – like I said, there was no perfect model for delivering a project. And so, it's very contextual in terms of what would have needed to be done and to know it would've been – would have required a lot of detail and a lot of investigation to figure out what was done – what should have been done. I don't know.

MR. HISCOCK: Did you evaluate the quality control/quality assurance process?

DR. GILLILAND: No.

MR. HISCOCK: How would you go about conducting an assessment of that? Do you have any view on –?

DR. GILLILAND: Quality control? Quality assessment?

MR. HISCOCK: Yes.

DR. GILLILAND: I have some experience with that. Evaluating whether it was sufficient or how –?

MR. HISCOCK: Yeah. A review of it, I guess, to see if the practices were up to speed and –

DR. GILLILAND: Yeah.

MR. HISCOCK: – if they were properly followed and implemented on the ground, I guess.

DR. GILLILAND: Well, there would be a manual and practices around that – a plan to execute the QA/QC, which I didn't review, but there would be a contract, ultimately. I would except that scope of QA/QC and a process that they – people would follow for that in terms of testing and verification.

MR. HISCOCK: Okay.

I'd like to take you to page 20 of your report. I believe this is a quote that you've been bought to or a section in your report you've been brought to before. It's just – it's the last paragraph in 6.0, it begins with: "Managing construction projects." "Managing construction projects requires a strong on-site team capable of motivating and organizing disparate teams of people and trades who wouldn't normally" – co-operate – "effectively" –

DR. GILLILAND: Collaborate.

MR. HISCOCK: – "collaborate effectively nor work towards a common objective. Administration and monitoring functions can operate remotely, but productivity is very dependent on strong, consistent and constant leadership in the field."

Do you feel that the project management team committed a grievous error by not being on site in Labrador, not consistently there? Well, Scott O'Brien and others from that project management team who were not on site.

DR. GILLILAND: I can't comment as to who was on and who wasn't on site, and so I'm not – I can't accept your – the assumptions in your question other than it would be – if they weren't, then that would have been a concern.

MR. HISCOCK: If you were spending $5 billion, you'd have your project manager on site. In this size of a project, you would have project management team there at – on site.

DR. GILLILAND: I would certainly have a team on site. Yes.

MR. HISCOCK: Finally, Sir, I would like to take you to Exhibit P-00434. And there's an abstract on page 6 of that document – 00434, and that's the report of Drs. Bernander and Elfgren. And maybe I'm mispronouncing those gentleman's names but …

If you could please review the abstract on page 6 and we're going to get down to it there – abstract, here we go. If you could review and comment on the three points summarized in that abstract.

DR. GILLILAND: Without reviewing the whole document it's difficult to glean all the content – all the content and context out of an abstract.

MR. HISCOCK: Yes.

DR. GILLILAND: And, it would be far more beneficial to have Evelyn Porter review this than myself, given that I'm not a geotechnical or environmental engineer. I guess I'm aware of the fact that the North Spur is a topic of conversation to putting – so beyond that, I'm sorry, I can't comment.

MR. HISCOCK: Okay.

Those are all my questions. Thank you.

THE COMMISSIONER: All right.

Edmund Martin.

MR. SMITH: Good afternoon, Sir.

Harold Smith for Edmund Martin.

I'm just – got a very few questions and I focus more on, you know, the process of how it came about that you got the retainer from Grant Thornton, okay?

DR. GILLILAND: Okay.

MR. SMITH: Now, first of all, are there others or competitors of yours that actually do the same kind of work, review and comment on this kind of documentation that you received?

DR. GILLILAND: I would assume there are, yes.

MR. SMITH: There are.

DR. GILLILAND: Yeah.

MR. SMITH: Okay.

DR. GILLILAND: There are other consultants –

MR. SMITH: So –

DR. GILLILAND: – in the Arctic.

MR. SMITH: – did you bid on this particular work, or RFP or …?

DR. GILLILAND: We were approached by Grant Thornton.

MR. SMITH: You were approached directly by them?

DR. GILLILAND: Correct. And I have no idea whether they approached others as well.

MR. SMITH: Okay.

DR. GILLILAND: I just – I have no idea.

MR. SMITH: Okay.

And did they provide you with a terms of reference?

DR. GILLILAND: Absolutely.

MR. SMITH: Yeah.

DR. GILLILAND: We had several conversations provided. First of all, there was a confidentiality agreement –

MR. SMITH: Okay.

DR. GILLILAND: – and then there was discussion about the scope and the intent and we had several conversations about myself and the team and the capabilities of Williams Engineering and, specifically, the individuals that would be involved.

MR. SMITH: Okay.

DR. GILLILAND: And based on that I –

MR. SMITH: I'm going to ask Ms. O'Brien if their terms of reference were entered as exhibits. No?

MS. O'BRIEN: I haven't seen –

MR. SMITH: Okay.

MS. O'BRIEN: – their terms of reference.

MR. SMITH: Now, my understanding also is that after they accepted you as the contractor to provide this review, they chose and provided the documentation for –

DR. GILLILAND: That's correct.

MR. SMITH: – you to review.

DR. GILLILAND: That's –

MR. SMITH: Okay.

So they selected that documentation, okay?

As a matter of interest, did they also provide to you their report to this Commission for Phase 1 or Phase 2?

DR. GILLILAND: The – for – well, for Phase 1 we contributed commentary and notes and verbal feedback.

MR. SMITH: Right.

DR. GILLILAND: Very little written feedback to them for Phase 1.
‘

MR. SMITH: Okay.

DR. GILLILAND: Phase 2, there was – we were not provided with their – the report that was initially submitted. I – and we didn’t see it until it was entered as evidence.

MR. SMITH: Evidence.

What about Phase 1? Did you actually see their report in Phase – for Phase 1 before you did the Phase 2 work?

DR. GILLILAND: No.

MR. SMITH: Now, did you prepare a draft for comment of Grant Thornton – to Grant Thornton?

DR. GILLILAND: Of this report?

MR. SMITH: Yes.

DR. GILLILAND: Yes, so we did.

MR. SMITH: And did they provide you with feedback in that report?

DR. GILLILAND: Yes, they did.

MR. SMITH: Okay.

Now – and in terms of the documentation that were provided to you, my understanding from your evidence – and I’m at a loss as to when it was today, but my understanding of the evidence is that when there were documents that you thought you should look at, you asked Grant Thornton and they said, no, we want you to review just that set of documents. Is that correct?

DR. GILLILAND: The specific instance you’re referring to was related to volume 2 and 3 of the 1998 geotechnical –

MR. SMITH: Reports?

DR. GILLILAND: – information reports. Correct, yeah.

MR. SMITH: What about others? Had you requested and obtained any additional information over the original information?

DR. GILLILAND: There was at least two other occasions I can remember because we labelled the directories in our filing system according to when we received the documents. There are at least two other occasions where we received updates on a variety of topics.

MR. SMITH: Yeah.

DR. GILLILAND: Yeah.

MR. SMITH: What were those topics?

DR. GILLILAND: Oh, not sure that I can specifically remember, but they could have been any one of the nine, I suppose. Certainly sometime – let’s see here, I believe we received – I know we found – they forwarded on to us some additional construction reports, status reports, the Astaldi comments and some additional information about the ICS structure. Those are examples I can think of off the top of my head that were – there was some additional documentation that followed from the original package that they forwarded to us.

MR. SMITH: Now, just a couple of more questions. The transition that you spoke of, that’s from the EC –

DR. GILLILAND: EPCM?

MR. SMITH: EPCM, sorry – EPCM to the integrated. My understanding is, is that you had no in-depth or deep dive into how that or why that occurred, or what actually was on the ground, the situation.

DR. GILLILAND: That’s right.

MR. SMITH: Okay?

So, you have no direct knowledge, or any indirect knowledge, of how they – the team was, or if it was redistributed or moved around or people left. You have no real knowledge of that.

DR. GILLILAND: No, that’s not quite right.

I guess there's some names that keep coming up over and over again. We're aware that some people came and went and were shuffled roles, but in terms of a specific analysis of who went where and when, no.

MR. SMITH: And no particular analysis of – as to whether or not it was detrimental at that particular point in time to the project, or whether it was beneficial to the project.

DR. GILLILAND: Right, that would take a considerable effort –

MR. SMITH: Right.

DR. GILLILAND: – try to piece it – things together.

MR. SMITH: So you have no specific knowledge of whether project memory was actually lost, to the detriment of the project.

DR. GILLILAND: Yes. In my experience of all projects and observations of other project team members, I think when changes in personnel happen you're bound to lose some project memory. It's inevitable.

MR. SMITH: Yeah.

DR. GILLILAND: I don't think you can avoid it, but beyond that, specifics, no.

MR. SMITH: Right, so – but in terms of the project memory lost, we've encountered 3½ – oh, sorry, 6 million documents, I believe, now, there's a high degree of probability that the knowledge or the project knowledge was actually not lost, but really just recorded somewhere or – and held, isn't there?

DR. GILLILAND: Exactly.

Yeah, just because you have the documents doesn't mean that knowledge is readily available.

MR. SMITH: Okay.

That's all I have. Thank you.

THE COMMISSIONER: All right, I think we'll take our break here this afternoon for 10 minutes and come back to you.

So we'll just take a break.

CLERK: All rise.

Recess

CLERK: All rise.

Please be seated.

THE COMMISSIONER: All right, Kathy Dunderdale?

MS. E. BEST: No questions, Commissioner.

THE COMMISSIONER: Former Provincial Government Officials?

MR. J. KING: No questions.

THE COMMISSIONER: Julia Mullaley, Charles Bown?

MR. FITZGERALD: No questions, thank you.

THE COMMISSIONER: Robert Thompson?

MR. COFFEY: Yes.

Good day, Sir. My name is Bernard Coffey. I represent Robert Thompson who is a former clerk.

I have just a couple of questions. One is more a matter of – just let me see if I've got something right here.

I believe your report is, yes, P-01678. And if we can go to page 16, please? Okay, just scroll down a little bit, please? Go down a bit more. I just – right there, thank you.

Just – I have just noticed on this page: "Of the bidders for the powerhouse work, Astaldi ($1.26B) proposed the heated shelter solution, their competitor Salini JV ($1.25B)," and they go on from there. Are you certain that the Astaldi amount is right? Because my understanding is it was $1.105 billion, I think, give or take a bit.

DR. GILLILAND: You might be right on that.

MR. COFFEY: Okay.

So that's all. I just –

DR. GILLILAND: Yeah.

MR. COFFEY: – okay – and that's – I just noticed it in passing. And a more, perhaps, substantive question is this: is – in responding to questions from Ms. O'Brien, you used, I think, the words allowance, float and contingency.

DR. GILLILAND: Right.

MR. COFFEY: She suggested to you phrases like tactical risk, strategic risk. I'm gonna suggest to you, and I think – I don't know if she mentioned it – management reserve. In the world in which you operate, you know, in terms of that sort of thing, is there any real precision to that – those terms? Or is there disagreements between people who even practice in that area?

DR. GILLILAND: I guess I can only speak to how that would bump up against my usual scope of –

MR. COFFEY: Yes.

DR. GILLILAND: – practice on a project, and it certainly – I would say it's not a hundred per cent clear-cut. So there could – there would be – I would only assume and expect if there's a – my boundary, if you will, of practice that there would be for others as well.

MR. COFFEY: Okay.

DR. GILLILAND: So it's not certainly clear-cut, and I think that interface is really important in terms of understanding so that everybody's got it covered off one way or the other.

MR. COFFEY: And I'm gonna suggest then that for somebody such as yourself – and you have a Ph.D. and you're well into your career, okay, as an engineer – you know, where you can acknowledge that well, you know, in your – even in your world it may be somewhat grey from time to time and somebody else of comparable experience and education might take a different view of any particular, you know, characterization of –

DR. GILLILAND: Right.

MR. COFFEY: – for example, contingency and allowance and tactical risk amount and so on, if there's that kind of disagreement or lack of clarity amongst practitioners in that field, I'm gonna suggest it wouldn't be surprising then that people who do not practice in that field, for them, they may be confused or may not even understand the significance of whether – or how something is classified or characterized. Would you agree that that's the case?

DR. GILLILAND: Yeah, that seems reasonable. I would expect that for everybody in their careers and –

MR. COFFEY: Yes, and –

DR. GILLILAND: – their fields of –

MR. COFFEY: Okay.

DR. GILLILAND: – expertise.

MR. COFFEY: Thank you. Thank you very much, Commissioner.

THE COMMISSIONER: Thank you.

All right, Consumer Advocate?

MR. PEDDIGREW: Good afternoon, Dr. Gilliland. My name is Chris Peddigrew. I represent the Consumer Advocate who represents the electricity ratepayers in the province.

I won't have you up there very long. Just a couple of quick questions; I know it's been a long day.

DR. GILLILAND: No problem.

MR. PEDDIGREW: During cross-examination by Mr. Simmons, there were some – it seemed to be suggested sort of indirectly that one reason for not necessarily doing one borehole on a transmission line that's thousands of kilometres – I guess it's – it might not be feasible to do, you know, a borehole every single place where

you're going to place a tower. And that may or may not be the case, I don't know what the cost or how feasible that would have been.

But is that something that if you're not able find out for every transmission tower, thousands of kilometres – is that something that you would think would cause you to be more cautious in terms of how much contingency you're setting aside?

DR. GILLILAND: I think you set a contingency based on the level of comfort with the knowledge that you have. I think given – I've already expressed my opinion of how important geotechnical information is. And so more is always better; the gold standard, in my opinion, would be everywhere.

MR. PEDDIGREW: Right.

DR. GILLILAND: So, having said that, if it's simply inaccessible, to me that raises flags. As part of the construction process that if you're attempting to put a tower – in this case in an inaccessible location – that might be a problem. But there's lots of reasons why it could be inaccessible, so that might not be a problem either. It's context that's important.

MR. PEDDIGREW: Right.

DR. GILLILAND: So you can make assumptions.

MR. PEDDIGREW: Right.

In this case, I mean, the risk was that you could have thousands of kilometres all with locations that were – would require extra work in order to put down the tower –

DR. GILLILAND: Right.

MR. PEDDIGREW: – because you don't know what the conditions are in the ground.

DR. GILLILAND: In this case there were a lot of tower locations that were – that assumptions were made.

MR. PEDDIGREW: I just want to take you briefly to page 4 of your report, Exhibit 01678, Madam Clerk.

This is down towards the bottom of this page under your Findings heading and number 2.

DR. GILLILAND: Mm-hmm.

MR. PEDDIGREW: Do you have it open there?

DR. GILLILAND: I do.

MR. PEDDIGREW: And so, again, there were some questions from Mr. Simmons about, well, you know, you need to pick one P-factor if you're going to do a budget. You have to go with a P50 or something; you have to pick one, which is fair enough.

I guess I'm just looking for you to elaborate on, well, why would you do more than – or an assessment based on a P25 or a P75 or a P10 or a P90 and not just on one?

DR. GILLILAND: I think you would need to – you – like they did there on those graphs we were looking at, there were different values that were calculated – 25, 50 and 75 and then 10 and 90. In different locations those different P-values were calculated.

MR. PEDDIGREW: Right. What's the benefit of doing it that way?

DR. GILLILAND: You need to – the range that you calculate between is important. So if you have – if the range between a P10 and the P90 is $1, there – the – implicitly in that discussion, the level of accuracy of the information going into the model is deemed to be very, very detailed and very precise. But if the range of outcomes from P10 to P90 is a million dollars or a billion dollars or more, then the precision of the input variables and the precision of the risk and the variability of the factors being considered is much greater. Like, I think, that would've been intuitively obvious.

MR. PEDDIGREW: Right, okay.

DR. GILLILAND: And so that's – that level of that amount – that information is important in order to understand how tight your budget is.

MR. PEDDIGREW: Okay, just better – more information the better.

DR. GILLILAND: Yeah. Setting aside a P50 number when your P90 number could be double is – wouldn't likely be not addressing the variability of information correctly.

MR. PEDDIGREW: Thank you.

And then the last question, again, following up on Mr. Coffey's questions for you a moment ago about tactical risk, strategic risk, management reserve, allowance contingency – we've heard all these terms. I guess, basically, what it boils down to you're trying to identify things that you're aware of that could cause cost increases. And you're also trying to set aside something so that if things arrive that you're not necessarily aware of right now, but that are going to cause costs to increase, you want to set aside something for that as well.

DR. GILLILAND: Right.

MR. PEDDIGREW: Because usually on construction projects there are things that arise that you can't anticipate. Would you agree with that?

DR. GILLILAND: I have yet to see a perfect project.

MR. PEDDIGREW: Okay.

Are you aware that – for the Muskrat Falls Project one of the conditions of the federal loan guarantee that the Government of Newfoundland was able to get Canada to agree to was that the government had to agree to pay the cost of the project no matter what? No matter if they went over – so the Government of Newfoundland had to guarantee that they would pay the costs. Are you aware of that stipulation?

DR. GILLILAND: Only just since the –

MR. PEDDIGREW: Just through your role here.

DR. GILLILAND: – some of the testimonies.

MR. PEDDIGREW: Okay.

DR. GILLILAND: Yeah.

MR. PEDDIGREW: And so –

DR. GILLILAND: I've heard about it.

MR. PEDDIGREW: We've also heard some evidence in Phase 1 about a decision being made not to set aside a management reserve and the – I guess the theory behind that was, well, if contractors are aware that there's an amount of money set aside they might, you know, go for that amount of money realizing that it's set aside and it's available.

Would you agree that the same sort of risk would exist when contractors are aware that the government is backstopping the cost of the project?

DR. GILLILAND: Oh in – not being a contractor, but based on the – I mean reputations and conversations and observations anecdotally, we struggle with that as designers all the times in terms of what information we put on the construction documents, understanding that these games are being played.

So there isn't – just like there's no such thing as a perfect project, there's really no such thing as a project that doesn't have contingency somewhere. And I think that's almost a given. So those games are played.

MR. PEDDIGREW: Right. So contractors, sometimes if they know there's money available they'll play games in order to try and get it.

DR. GILLILAND: Right.

MR. PEDDIGREW: Okay.

Is that something – if you were quantifying that risk, in terms of a – like a – I would classify it as almost a bottomless pit. I mean with a private company running a project, there's a risk of bankruptcy. With a government – I mean I wouldn't say it's impossible, but it's much less likely that it would go bankrupt on a project.

So from a risk point of view, is that something that you could quantify as either a tactical risk or a strategic risk, that contractors know that government's paying for this regardless?

DR. GILLILAND: The most effective defences I've observed have been by an exceptionally good project team. So that includes the owner, it

includes the design team and the construction manager or all the other components that are just very firm and very clear about – so there's strategies around pushing back, if you will, against these – against that strategy from a contractor. But nothing – you know, like I said, there's no perfect projects so there will be additional funds expended for sure.

MR. PEDDIGREW: There's always a risk they're going to –

DR. GILLILAND: There's always a risk.

MR. PEDDIGREW: – come looking for more.

DR. GILLILAND: But there's – there are strategies around mitigating that.

MR. PEDDIGREW: Okay.

I think that's everything. Thank you.

THE COMMISSIONER: I think the only other party that's here is Astaldi Canada.

MR. BURGESS: Good afternoon, Dr. Gilliland. My name is Paul Burgess and I represent Astaldi Canada Limited.

And, Madam Clerk, there's just going to be a couple of questions. It's on Exhibit P-01678, the report, and it will be pages 7 – and page 17 will be my second questions.

First, page 7 of your report, Dr. Gilliland. And I want to refer you to paragraphs 21 and the first sentence of paragraph 22. At paragraph 21 of your report it says: "At the tender stage, the productivity rate calculated by Astaldi was reasonable assuming other risks were mitigated appropriately, such as geotechnical conditions, labour scheduling and schedule delays."

Paragraph 22, the first sentence says: "The impact of cold weather was not considered adequately."

My question to you, Sir, is what is the basis for the first sentence in paragraph 22 that the impact of cold weather was not considered adequately?

DR. GILLILAND: There's – I guess specifically for the Astaldi contract we're talking about the powerhouse construction, and the conversation and the comments in the documentation reviewed – and I'm sure you're going to ask me for an example of this, which I can't think of off the top of my head, but leads to the conclusion that the perspective rather that everything will be enclosed, so we will take care of the weather – that takes care of the weather problem. So whether or not there was anything beyond that, I'm not – it doesn't – there was no mention of it in the documents that –

MR. BURGESS: Right.

DR. GILLILAND: – I saw.

MR. BURGESS: But as I understand your evidence earlier, that was what was referred to in your earlier evidence, I think, of – under questioning, was plan B, correct?

DR. GILLILAND: Well, plan B would be if –

MR. BURGESS: If the ICS failed –

DR. GILLILAND: – ICS failed –

MR. BURGESS: – and –

DR. GILLILAND: – there are other factors, too, to cold weather.

MR. BURGESS: Right, but as I understood what you said this morning is you wouldn't have expected necessarily a plan B. It would've been once the ICS, if it did fail, then how you would address that, as opposed to anything else.

Did I understand you correctly?

DR. GILLILAND: You said once the ICS had failed. I guess that's –

MR. BURGESS: No, so let's say – if I understood your evidence earlier today correctly –

DR. GILLILAND: Mmm.

MR. BURGESS: – you said it wouldn't be necessarily inappropriate for not to have a plan B if the ICS failed, because you'd go into that thinking it's going to succeed.

DR. GILLILAND: Right.

MR. BURGESS: And that was the methodology that was being proposed.

DR. GILLILAND: Mm-hmm.

MR. BURGESS: And if I understood you then to go on to say, it's what you would do then, upon a failure or issues, that you would look at plan B at that time, but it wasn't necessarily inappropriate not to have a plan B going into it.

So I'm just trying to narrow down when –

DR. GILLILAND: Mmm.

MR. BURGESS: – the statement is, is the impact of the cold weather was not considered adequately the fact that there wasn't a plan B if the ICS failed, or is it something else?

DR. GILLILAND: I think there are additional factors in going to, I think for – to consider the impacts of cold weather. As soon as you leave the enclosure, you're out in the cold weather again, and you have the whole context of being snowed in as an example. Or even in the summertime, a very – a significant rain event can cause problems for a site and, ultimately, the ability to work inside.

MR. BURGESS: Right, but the statement itself says it wasn't considered adequately. And I'm not sure what aspect, or what wasn't considered adequately at the bid stage, because I think that's what you're referring to in this sentence. And I'm looking for you to direct me to something in the documents or a report you saw that points to what is the basis for that conclusion or statement.

DR. GILLILAND: The – excuse me, the factor that when the productivity factors are – were considered, they were looked at as if weather was not a significant issue to be incorporated.

MR. BURGESS: Due to using the ICS. Is that – ?

DR. GILLILAND: Right, when the ICS was –

MR. BURGESS: Right.

DR. GILLILAND: – being used.

MR. BURGESS: So what wasn't adequately considered – if they were going to use a methodology of an ICS and you said, fair enough, don't need a plan B necessarily at that point, then, what wasn't considered adequately? If the approach was we're going to use an ICS and that was effective, what wasn't adequately considered in that case?

DR. GILLILAND: What I didn't see evidence of was the consideration of impact of weather on, literally, potentially getting materials to site, so not – I'm talking about issues that would not be inside the ICS, but the logistics of supporting the ICS, if you will.

MR. BURGESS: Okay.

And was the limited – was that review and that issue limited to Astaldi, or was that all the bidders, the four bidders, or did you look at that.

DR. GILLILAND: We really just focused on the Astaldi –

MR. BURGESS: Okay.

DR. GILLILAND: – issue.

MR. BURGESS: Then, Sir, if I could bring you to your page 17 of the report and we've got a couple of questions. And that part of the report deals with the ICS. And when you were giving evidence earlier today in the review of the ICS and the documents and design, you were – specifically referenced Exhibit P-01964 and that was the drawing of the ICS.

DR. GILLILAND: Okay.

MR. BURGESS: Other than that document – and if you want to review it – if you want it brought up, we can bring it up but that's the Exhibit P-01964 and the – I'll call it a schematic that you referenced – was there any other documents you reviewed in relation to the design of the ICS or was that the document – the sole document?

DR. GILLILAND: There were additional documents provided that didn't provide a whole lot more detail honestly. There was some

additional drawings around some of the wall elevations and some additional information around what the structure would look like and how the intent of the design and how it would work beyond just those two slides that we were looking at.

MR. BURGESS: Right, but beyond that document –

DR. GILLILAND: So there was sufficient –

MR. BURGESS: – was there another document –

DR. GILLILAND: Yes.

MR. BURGESS: – that you looked at? And, if so, I think if you had – refer to your list, Exhibit P-02330, Madam Clerk, I think that outlines the documents you reviewed.

DR. GILLILAND: Right. Okay.

MR. BURGESS: If you could take a look.

DR. GILLILAND: 02330, yeah.

MR. BURGESS: And I'm not sure –

MS. O'BRIEN: Tab 2.

THE COMMISSIONER: Tab 2.

MR. BURGESS: Tab 2 of your material.

DR. GILLILAND: Mm-hmm.

You'll have to bear with me for a second while I look for the – if I can find the references.

MR. BURGESS: Certainly.

DR. GILLILAND: Under – so this is page 13. There are several items listed here on that page at the top.

MR. BURGESS: (Inaudible) list?

DR. GILLILAND: Okay. So it's A01-12 –

MR. BURGESS: So it's the second –

DR. GILLILAND: – for instance and then on page –

MR. BURGESS: – block I'll take it? And then going down for three blocks, is that – are those the documents?

DR. GILLILAND: Certainly, those ones it looks like ICS –

MR. BURGESS: Oh, sorry.

DR. GILLILAND: – is referred to in these other – keep going.

MR. BURGESS: Yes, okay, I'm sorry. All right.

And so those are the documents you were referring to.

DR. GILLILAND: Right.

MR. BURGESS: Were any of those the final design or a more detailed design?

DR. GILLILAND: No, they were not.

MR. BURGESS: And why was the reason – what was the reason for not asking for or looking at the final design of the ICS in preparing the report?

DR. GILLILAND: Well, as by – as we understood the progression of events, the design went back and forth several times with SNC and, presumably, Nalcor and wasn't completed until later in 2014.

So the – I guess the impact of the – it wasn't so much that we questioned that the design was possible; the issue was the duration between when it started to when the design was complete.

MR. BURGESS: Right. But I understood – if my recollection is correct, when you were being asked questions by Ms. O'Brien this morning, that one of your comments in looking at the design was you wondered about how the design would work. And I just –

DR. GILLILAND: Oh, I see what you mean.

MR. BURGESS: And if that was the case, it would've seemed to me that an inquiry into more detailed design might have answered your question to your – your comment I think was, I wondered why. And I didn't hear you say that you made any other inquiries or looked at any other documents and I'm wondering why that was the case. Why wonder and why not determine it?

DR. GILLILAND: Well, we had limited time and budget to complete the work, I guess, and it didn't get to that level of detail.

MR. BURGESS: Okay, so it was a limitation and you've identified the limitations of your report and opinions. Correct?

DR. GILLILAND: Certainly, yes.

MR. BURGESS: Okay.

Then in – on page 17 on the last paragraph, I just want to bring your attention to that paragraph. And after the first sentence it goes on to talk in your report about subsequent to the tender process. And you talked about what Astaldi would need to do – what Astaldi, Nalcor and SNC would need to do to address IC issues and get approvals or acceptances to proceed, but then it seems, to me, that it stops. So it identifies what ought to be done, but your report doesn't seem to address whether those things were done.

As I understood the scope of your report, it was to identify best practices and also identify if those best practices were followed. Am I right in saying I see the best practices you've identified, but not gone to the next step just to say or inquire as to whether those best practices were followed?

DR. GILLILAND: We didn't follow the issues through to their conclusion through the forensic review, you're right. We didn't have the documents to do so. And within, sort of, the timeline, I guess, limitations in terms of time and resources to get that done, we didn't do it.

MR. BURGESS: Okay. Thank you.

Those are the only questions. Thank you, Sir.

THE COMMISSIONER: Redirect?

MS. O'BRIEN: Thank you.

Just two areas of questioning arising out of Mr. Simmons's examination: first, Madam Clerk, P-01678, page 28. This is your report, Mr. Williams. And Mr. Simmons – please, the bottom sentence of the page, Madam Clerk.

Mr. Simmons had asked you about the source of the last sentence on this page: "Regardless of the ICS, SLI did not believe that the required concrete placement schedule was achievable …." And you said, I believe, that you recalled seeing an email to that effect. And Mr. Simmons had suggested that it would be found among your – the list of documents. I believe I may be able to put you to that email so I just want to confirm.

P-00130, please, Madam Clerk, page 235. Here is an email from Paul Lemay to Jason Kean. Mr. Lemay was the lead estimator for SNC-Lavalin. I'm just going to scroll down here. He was making some observations.

And on the bottom of that email here he makes a conclusion about: "This is a quite aggressive schedule because of the huge quantities involved in a relatively short period of time and although the day/cycle ratio seems to me reasonable, the fact remain that, running at a pace of some 480 m3/day, for almost three consecutive years, at every day, will remain quite a challenge!

"I suggest we put a time or money provision in our contingency plan, to overcome a possible failure that may occur."

Is that the email you were referring to?

DR. GILLILAND: That's the one I was referring to.

MS. O'BRIEN: Okay, I just wanted to tie up that loose end.

DR. GILLILAND: Thank you.

MS. O'BRIEN: Also, with respect to – Mr. Simmons was questioning you on – with respect to your – the findings in your report the best practices on the transmission line and the geotechnical investigations. I know Mr. Simmons questioned you about – and you said

that there was nobody on your team who had experience on a power line, an extensive power line of this type, but I just wanted to explore that a little bit further. Did other people – did people on the team have experience with linear projects as they're sometimes called?

DR. GILLILAND: Right.

Yes, Evelyn certainly does.

MS. O'BRIEN: Okay.

And just can you give me a little bit more detail about that? And then the next obvious question is: Is the experience there transferable to a power transmission line?

DR. GILLILAND: Right.

I guess the short answer – let me just find Evelyn's resume for a moment.

MS. O'BRIEN: Should be at tab 5 –

DR. GILLILAND: Five, yeah.

MS. O'BRIEN: – for you –

DR. GILLILAND: I've got it here.

MS. O'BRIEN: – P-02333.

DR. GILLILAND: Certainly, yeah.

So in terms linear project experience, Evelyn has worked on it considerably. And, as I mentioned earlier, the communications right of way, not for power transmission but for communications, mining applications, roads and highways and pipelines – and pipelines obviously being very linear. And, you know, the extent of geotechnical investigations that occur on a pipeline project, for instance, are very considerable, not just for the fact that it's carrying oil, but for the purposes of geotechnical and design purposes.

MS. O'BRIEN: Okay.

And do you consider –

DR. GILLILAND: So is it –

MS. O'BRIEN: – that to be transferable?

DR. GILLILAND: Do I consider it transferable? Yes, I do absolutely consider this best practice transferable or gold standard or certainly the aspiration to achieve as much detail as possible.

MS. O'BRIEN: Okay. Thank you.

Those are my questions.

THE COMMISSIONER: All right.

Thank you, Sir. You can step down.

Thank you.

DR. GILLILAND: Thank you.

THE COMMISSIONER: All right, we'll move on now to the next witness, Mr. Learmonth.

MR. LEARMONTH: Next witness is James Meaney.

THE COMMISSIONER: All right, James Meaney?

MR. SIMMONS: He's on the way up. He's just downstairs.

THE COMMISSIONER: Okay, we'll just take a couple of minutes. He's on the way up, is he, Mr. –

MR. SIMMONS: Yes, that's correct.

THE COMMISSIONER: Okay.

CLERK: All rise.

THE COMMISSIONER: We'll just take a couple of minutes there.

Recess

CLERK: Please be seated.

THE COMMISSIONER: All right, Mr. Learmonth.

MR. LEARMONTH: Yes.

James Meaney.

THE COMMISSIONER: Okay.

And, Mr. Meaney, could you stand, please? Do you wish to be sworn or affirmed?

MR. MEANEY: Affirmed.

THE COMMISSIONER: Affirmed?

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

MR. MEANEY: I do.

CLERK: Please state your name.

MR. MEANEY: James Meaney.

CLERK: Thank you.

MR. LEARMONTH: Yes.

I'd like to enter some exhibits first.

THE COMMISSIONER: Go ahead.

MR. LEARMONTH: P-02350 to P-02362, P-02366 to P-02398, P-02400 to P-02419.

THE COMMISSIONER: All right. That's it?

MR. LEARMONTH: Yeah.

THE COMMISSIONER: Those exhibits then will be marked as numbered.

MR. LEARMONTH: Mr. Meaney, where do you live?

MR. MEANEY: I live in Paradise, Newfoundland.

MR. LEARMONTH: Yes.

And can you state your present occupation?

MR. MEANEY: Sure.

I am the vice-president of Finance, Power Supply with Nalcor Energy. So I have accountability for the non-regulated electricity components of the Nalcor business.

MR. LEARMONTH: Right.

Please state your educational background after high school.

MR. MEANEY: Sure.

I graduated from Memorial University in 1998 with a Bachelor of Commerce with a finance concentration. And, as well, after graduation from Memorial, I – when I was living in Toronto working in the corporate finance and investment banking field, I earned my chartered financial analyst designation during that time.

MR. LEARMONTH: And that's a designation that's given by the CFA Institute?

MR. MEANEY: That's right.

MR. LEARMONTH: Okay.

MR. MEANEY: Yes, that's an institution out of the US and it's focused around investments and corporate finance-type work.

MR. LEARMONTH: Yes.

And how long did it take you to get that CFA designation?

MR. MEANEY: That was a three-year program.

MR. LEARMONTH: Okay and you're – they call you a charter holder now, is that right?

MR. MEANEY: Yes, I'd be a –

MR. LEARMONTH: Okay.

MR. MEANEY: – charter holder of my chartered financial analyst designation.

MR. LEARMONTH: Okay.

So after you – just to go back, after you finished at Memorial in 1998, what is your work history?

MR. MEANEY: Sure.

In 1998, I moved to Toronto and I worked with a number of firms, as I mentioned, in the corporate finance and investment banking field, working on financing transactions, acquisitions, divestitures, that type of work. And then in 2004, I moved to the United States. I was part of a management team that was sent down to help turn around a consumer products company. They had been bought by a Canadian-based private equity fund.

So I went down in a role of the head of corporate development for that organization. And I would have been responsible for mergers and acquisitions, as well as new business expansion, so building new locations for the company across the United States and Canada. And I was in that role from 2004 until 2010.

MR. LEARMONTH: Okay.

By the way, where – what state and city did you work in that capacity?

MR. MEANEY: It was in Florida.

MR. LEARMONTH: Yes.

MR. MEANEY: And people always ask me why I moved back from Florida to Newfoundland and I told them it wasn't about the weather, there was many other good reasons why. And it would have been in the City of Boca Raton was where our offices were raised out of.

MR. LEARMONTH: Okay.

Okay, so you returned to Newfoundland in 2010 you said.

MR. MEANEY: That's right. I came back in July of 2010 to Newfoundland and started working right away at that point in time with Nalcor Energy. I started in the role of assistant treasurer and I was in that role until early 2011 at which point I became the corporate treasurer for Nalcor Energy. And I was in the role of corporate treasurer until, I think it was, the end of 2012, at which time I became the general manager of Finance for the Lower Churchill Project. And I was in that role until 2016 at which point in time my accountability expanded. So in addition to the Lower Churchill Project, I also had finance accountability for Churchill Falls, the 5,400-megawatt facility, for energy marketing and for Nalcor's oil and gas operations. And then in the spring of 2017, I became the role that I am now, the vice-president, Finance for Power Supply. And as part of that, I have accountability for Lower Churchill Project, Churchill Falls and energy marketing, because the oil and gas business is being spun off from Nalcor, I no longer have accountability for that part of the business.

MR. LEARMONTH: Right.

So since you went to work at Nalcor in July 2010, have you reported to the same person or persons?

MR. MEANEY: For most of that time, yes, either – I guess either directly or indirectly.

So, through most of that period, I would've reported to Derrick Sturge, who is the chief financial officer for Nalcor. There was a period in the early days, where the gentleman who I worked for reported into Derrick, so that's why I said indirectly, but it was – starting in, I guess, when I took on the role of general manager of finance for the Lower Churchill Project in late 2012, I would've reported directly to Derrick all through that period, up until the spring of 2017 when I went into the role of VP of finance for power supply. And there was a brief period there, I guess it was up until last month, that I reported into John MacIsaac, who was the executive vice-president for power supply, but I still had a, I guess, an indirect reporting relationship with Derrick. And then with the departure of John from Nalcor, I'm now back into directly reporting for Derrick Sturge.

MR. LEARMONTH: Okay, well let's say between 2012 and 2015, during that entire period, were you reporting to Derrick Sturge –

MR. MEANEY: Yeah, from the –

MR. LEARMONTH: – the CFO?

MR. MEANEY: – from the end of 2012, yes, until 2015, it would've been direct into Derrick.

MR. LEARMONTH: Though at the time of sanction of the Muskrat Falls Project, December 17, 2012, were you reporting to Derrick Sturge?

MR. MEANEY: Not directly. I would've reported to a gentleman who reported into Derrick, at the time of sanction.

MR. LEARMONTH: Who was that?

MR. MEANEY: That would've been Rob Hull.

MR. LEARMONTH: Rob Hull.

MR. MEANEY: Yeah. And he was a – I think he was a general manager.

MR. LEARMONTH: Okay.

Now, the – in terms of the – so, you still report to Derrick Sturge, I take it.

MR. MEANEY: Correct.

MR. LEARMONTH: I know there was a brief time when you reported –

MR. MEANEY: Yeah.

MR. LEARMONTH: – to John MacIsaac.

MR. MEANEY: Yep.

MR. LEARMONTH: So is there anyone between you and Derrick Sturge on the leadership, the financial department leadership?

MR. MEANEY: Currently?

MR. LEARMONTH: Yes.

MR. MEANEY: No.

MR. LEARMONTH: Okay, so you're next to Derrick –

MR. MEANEY: Exactly.

MR. LEARMONTH: – Derrick Sturge. Okay.

When did you become involved in the Muskrat Falls Project?

MR. MEANEY: I think early on in my time at Nalcor in 2010 started to get some involvement and helping the gentleman who was the corporate treasurer at that time, Mark Bradbury, providing some support. And then it was really, I'd say, almost a full part of my time starting in 2011, when I became the corporate treasurer, and our focus, or the finance team's focus, really, was on developing the financing strategy for the Lower Churchill Project.

So from about 2011 onwards up to, you know, financial close, obviously it was pretty much full time.

MR. LEARMONTH: Okay.

And what are the reporting requirements between the Muskrat Falls Project team and Derrick Sturge and you?

MR. MEANEY: So in terms of how the organization is set up, the Muskrat Falls Project team would report up into the vice-president of the Lower Churchill Project, so for a period that was just Gilbert Bennett, and then I think it was in 2016 that was split between Gilbert on the generation side and John MacIsaac on the transmission side, and then each of those gentlemen would've reported up into the CEO.

And then in terms of finance, I had accountability, the finance team for Lower Churchill Project had separate accountability into Derrick.

MR. LEARMONTH: So finance, just tell us what that means. I mean, I know – I think everyone knows generally, but what – in terms of the financing for the Muskrat Falls Project, just give us a brief description of what that encompasses.

MR. MEANEY: Sure, maybe, a bit of context.

The finance team for the Lower Churchill Project had a couple of major accountabilities. I think in the period we're focusing on now, the primary focus would've been the financing. So, I was part of the team that negotiated the federal loan guarantee, that was part of the Nalcor team, and then I also ran the financing process that resulted in the $5-billion debt issuance in 2013.

We would've also had accountabilities in terms of financial reporting. So, the financial statements of the Lower Churchill Project entities, that would be an accountability of my team. And then some of the financial controllership duties, so making sure that as invoices came in from contractors, they were processed and attested and then paid on a timely basis, and some of the policies and procedures relating to, you know, financial management that went along with that.

MR. LEARMONTH: So in order to report on the financial statements in relation to the Muskrat Falls projects, you would have to, I expect, know what the current applicable budget costs or final forecasts were?

MR. MEANEY: The financial statements would be a record of the historical financial results of the entities.

So, each of the Muskrat Falls companies – Muskrat Falls Corporation, Labrador-Island Link Partnership, the Labrador Transmission asset – Corporation, they each have their own financial statements 'cause they're separate legal entities, and those would capture the historical financial results.

So we would issue the financial statements on a quarterly basis and on an annual basis.

MR. LEARMONTH: So, would you know about the budget costs from time to time as they changed?

MR. MEANEY: Oh yes, yeah. So I guess one thing that I would be aware of would be, as part of the – I'll say the financial controllership duties of my group – one would be that we are the stewards of the authorization for expenditure, you know, the approved budget process. So making sure that if a requirement is needed that the board has to approve an AFE or revised AFE, you know, being the team that gets that documentation together, gets that approved by the board, and then make sure that the processes relating that are managed.

MR. LEARMONTH: Okay, well I'm not just talking about AFEs, I'm talking about budget – you know, final forecast costs, or management outlooks and so on. Not just AFEs.

MR. MEANEY: Okay, sorry. Yeah.

So, I guess final forecast costs would be an input in terms of determining what the AFE would be, but in terms of, I guess managing the final forecast costs and the reporting of final forecast costs, that would be the accountability of the project controls team, within the project team. And that does not report in to me; that's in to the project team.

MR. LEARMONTH: But you – you would report – you were responsible for reporting to the federal government – the monthly construction reports, weren't you?

MR. MEANEY: So the construction reports are a document that are issued under the project finance agreement, so I would have been responsible for, you know, the negotiation of the project finance agreements and some of the ongoing compliance related to that. But in terms of the group that produces the information that goes into the construction reports, that comes out of the project controls team.

MR. LEARMONTH: Yeah. But you receive that information and pass it on to –

MR. MEANEY: Yes, yes.

MR. LEARMONTH: – the federal government.

MR. MEANEY: So they produce the report, then folks on my team issue that report on a monthly basis, along with a number of other documents that relate to the project finance agreements.

MR. LEARMONTH: Do you verify it?

MR. MEANEY: No, that work is done by the project controls team. So all the QA, and review of the information that would have been in terms of cost information, that comes out of the project controls team. I would review the construction report, and read it before it's issued, just in terms of some of the language and the commentary in it, but in terms of the numbers that are presented, I'm taking that as an input from the folks who are in the project controls team.

MR. LEARMONTH: Okay. So, but you – unless – so you'd accept what was presented to you unless you, for example, you knew that there was something that was missing. Is that right?

MR. MEANEY: If I saw something in the – for example, in the commentary or the report that I thought needed to be added, then I would let the project controls folks know: I think you need some added commentary here. And they would update it, and then that would be the document that would be –

MR. LEARMONTH: And that would be without exception, is that correct?

MR. MEANEY: Yeah. On a monthly basis I do (inaudible) now. I mean, there's often months when I have no further comments on the construction reports and they get issued as they are.

MR. LEARMONTH: Yeah.

But if you think that there's something missing in a construction report for any given month, some financial information, or they got the wrong figure or the wrong estimate – you would, I take it, not issue the report until that situation was corrected. Is that true?

MR. MEANEY: I guess in terms of, you know, verifying the numbers that are in the charts in the construction report, I wouldn't be specifically doing that. That would have been part of the function from the project controls team.

MR. LEARMONTH: Yeah.

But if you had actual knowledge that there were other figures that were not included and not used in a monthly report that you were sending to Ottawa, would you not inquire further into it before you submitted it to Ottawa?

MR. MEANEY: Yes, I mean, I guess if there was something, there was some information that I thought would be relevant, then, you know, we'd obviously have a discussion with the folks in the project team about that.

MR. LEARMONTH: And you have a duty to present correct information to Ottawa, is that right?

MR. MEANEY: We have a duty to present the information in the construction report based on the template that was set out in the project finance agreements and –

MR. LEARMONTH: Mmm.

MR. MEANEY: – you know, the representations and warranties that are made around the information in there.

MR. LEARMONTH: Okay. Well, we'll come back to that later, but I just wanted –

MR. MEANEY: Sure.

MR. LEARMONTH: – to make sure that I was correct in that – on that point.

Okay. Now, I'd like you to turn to – you have five volumes there before –

MR. MEANEY: Okay.

MR. LEARMONTH: – you, Mr. Meaney.

MR. MEANEY: Yes.

MR. LEARMONTH: In addition, the exhibits will come up on the screen.

MR. MEANEY: Right.

MR. LEARMONTH: And when we refer to a page number in the exhibits, we're referring to the numbers in the top right-hand corner, not the – nowhere else.

MR. MEANEY: Okay.

MR. LEARMONTH: So I'd like you to turn to volume 4, tab 98, which is Exhibit P-02392.

MR. MEANEY: P-02392. Yes.

MR. LEARMONTH: You have it?

MR. MEANEY: Yes. It's an email about the independent engineer, I think?

MR. LEARMONTH: Okay. Now, turn to page 3 of that report.

MR. MEANEY: Page 3. Yes, yep.

MR. LEARMONTH: Yeah.

So this is the agreement, no. LC-PM-082, and this is the agreement between Nalcor and MWH Canada for the appointment of that company as the independent engineer for the Muskrat Falls Project, is –

MR. MEANEY: Correct.

MR. LEARMONTH: – that correct?

MR. MEANEY: Yes.

MR. LEARMONTH: And you can just turn to page 5.

MR. MEANEY: Page 5. Yes.

MR. LEARMONTH: Yeah.

I think you'll see that this agreement was dated August 27, 2012.

MR. MEANEY: Okay, yes.

MR. LEARMONTH: Yeah.

And then it was signed – if you turn to page 26, you'll see that it was signed by both Nalcor and MWH Canada Inc., correct?

MR. MEANEY: Yes. Yes, yep.

MR. LEARMONTH: Okay.

I'd like you to turn to page 29, under paragraph 3, and we're still on Exhibit P-02392.

I won't read the whole paragraph, but I want to read a couple parts. The first paragraph under point 3.0, client assignment: "Contractor's client for each Project is not the Owner of that Project but, instead, the lenders, the hedge providers, the federal government as guarantor, and such other entities as may be involved in providing financing for, or financial guarantees in support of, each of the Projects (initially and collectively 'Client')."

And then I'll move down to the second paragraph, which says: "The role of the IE is to provide independent engineering advice and independent engineering reports. Given the size, scope, and complexity of LCP, and the schedule for achieving financial close, Contractor will initially be retained and paid by Company on behalf of the Clients so that Contractor can familiarize itself with each of the Projects and LCP as a whole, identify the documents and information that will be required for its IE review, and commence an initial review of the documents and information currently available."

And then the third paragraph, first sentence: "When the lead lenders for each Project are known, or as otherwise required, the Agreement will be retained separately, either directly or indirectly, by those lenders and by the hedge providers and federal guarantor, as the 'Client' for that Project, provided Contractor is acceptable to those lenders." Now, the – at the point that you signed – your – when I say you, I mean Nalcor, obviously – August 27, 2012. Is it correct that you had no communications or limited communications with the federal government at that point?

MR. MEANEY: No, there would've been – and maybe I can give a bit of background in terms of the scope of work –

MR. LEARMONTH: Yeah.

MR. MEANEY: – and the process that unfolded.

MR. LEARMONTH: Yeah.

Well, I think there was a memorandum of agreement signed on August 11, 2011. Is that right?

MR. MEANEY: I – it was – there was a memorandum of agreement in 2011, yes. So that would have been the initial, I guess –

MR. LEARMONTH: Yeah.

MR. MEANEY: – the key principals of what the federal loan guarantee terms –

MR. LEARMONTH: Yeah.

MR. MEANEY: – were gonna entail.

MR. LEARMONTH: Well, did you – were you involved in that stage?

MR. MEANEY: With the memorandum of agreement? Yes.

MR. LEARMONTH: You were?

MR. MEANEY: Yeah, (inaudible) –

MR. LEARMONTH: Okay, well, just take us back and bring us forward from August 2011, or whenever that –

MR. MEANEY: Sure.

MR. LEARMONTH: – memorandum of agreement was signed.

MR. MEANEY: Yeah.

MR. LEARMONTH: And bring us up to your – a description of your involvement in – with respect to the federal loan guarantee from that date, August 2011, up until August 27, 2012.

MR. MEANEY: Sure.

And I guess there was a couple, you know, steps along the way, and I'll tie in how the independent engineer fit into that as well. So as you mentioned, in 2011 we would've executed the memorandum of understanding with the federal government. So that was between Newfoundland, Canada, Nova Scotia and then Emera and Nalcor. And then in – it would've been late 2011, we actually started developing this document, the scope of work for the independent engineer services. And as part of that, we engaged the services of Faskens, Fasken Martineau, they were our financing counsel on the financing arrangements, the federal loan guarantee.

MR. LEARMONTH: They're a law firm in Toronto, right?

MR. MEANEY: They are, yes, and they were –

MR. LEARMONTH: And Vancouver, yeah.

MR. MEANEY: Yeah, they're a global law firm, and they have offices in Toronto, Vancouver, Montreal, a bunch of different places. And they had a gentleman on their team out of their Vancouver office who – his focus and his expertise was construction law, and in particular had a lot of experience acting on behalf of both lenders and borrowers in project financings. So he would be very familiar with the role of an independent engineer as part of a project finance structure.

And it was around that time that Nalcor started developing the concept that the Lower Churchill Project was gonna be structured as a investment-grade project financing, and there's a number of attributes that go along with that in terms of lenders and guarantors, recourse to assets and contracts, equity commitments of the sponsor, how cost recovery is gonna happen in terms of repayment of debt and the need for an independent engineer. So that would've been all stipulated in the rating agencies' criteria and would've been confirmed in our non-guaranteed indicative credit ratings in 2011 and 2012.

So Faskens helped us develop the scope of work. We would've then issued an expression of interest for independent engineer services in late 2011. The list would've been shortlisted to MWH, who was based out of Canada, out of Vancouver; a firm called E3, who were based out of the US; and another firm named Black & Veatch, who were based out of the United States.

So we issued an RFP to them, and I believe it was February 2011. Included in that would've been this scope of services. So, you know, right from the get-go, as – Mr. Learmonth, as you pointed out, it was very clear to anyone bidding on the independent engineer that they were being engaged by Nalcor on an interim basis to get an early start on the process, and then once the financing structure was finalized, they would go work on behalf of the lenders or the guarantors, so there was a process that unfolded through the spring and summer of 2011 where we went through the RFP process for independent engineer services, and eventually MWH was picked out of that process; and during that period we would have been in negotiations with the Government of Canada on what would eventually be the federal loan

guarantee term sheet or federal loan guarantee agreement that was signed in November of 2012.

So before we went ahead and did the, you know, the final award of the independent engineer services RFP, we did consult with the Government of Canada, knowing that they would likely be the entity who the independent engineer would be working for. We also provided them with copies of the contract and the scope of work to make sure that they were okay with that.

MR. LEARMONTH: Yeah, because they have to approve the appointment. You could have – it could have happened that you appointed MWH under this August 27 of 2012 –

MR. MEANEY: Yeah.

MR. LEARMONTH: – agreement and for whatever reason, when you went to the federal government they could have said that's not acceptable –

MR. MEANEY: Exactly.

MR. LEARMONTH: – we want someone else, right?

MR. MEANEY: So – exactly –

MR. LEARMONTH: Yeah.

MR. MEANEY: – so we wanted to make sure that we didn't have that situation.

MR. LEARMONTH: Right.

MR. MEANEY: So we made sure they were okay and then the contract award, as you noted, would have happened in August. There would have been a kickoff meeting with the independent engineer in September –

MR. LEARMONTH: Okay. I just –

MR. MEANEY: – of 2012.

MR. LEARMONTH: – just –

MR. MEANEY: Yeah.

MR. LEARMONTH: – let's slow it down a little bit.

MR. MEANEY: Sure.

MR. LEARMONTH: Mr. Argirov testified yesterday – did you see his testimony?

MR. MEANEY: Yes I did.

MR. LEARMONTH: Or – yeah.

And well – actually on Tuesday, and early yesterday morning. So you followed his testimony did you? Yeah.

MR. MEANEY: I did, yes.

MR. LEARMONTH: He mentioned that at some point in 2011 – late 2011, that MWH Canada had bid for – put in a proposal to be the EPCM contractor?

MR. MEANEY: Yes, I –

MR. LEARMONTH: Which was subsequently awarded to SNC-Lavalin.

MR. MEANEY: Yes, I think –

MR. LEARMONTH: Okay.

MR. MEANEY: – in the early days –

MR. LEARMONTH: Were you aware of that?

MR. MEANEY: Yeah, I was.

I think in the early days of the RFP for EPCM services, MWH actually – I think they teamed up with Black & Veatch, who were one of the other firms that bid on the independent engineer services and subsequently through the process, I think it was Black & Veatch decided they wanted to go themselves. So MWH didn't end up being part of the final RFP on that.

MR. LEARMONTH: And that corresponds generally with what Mr. Argirov said. Yeah.

Okay. So that was the first relationship that you were aware of between Nalcor and MWH when they bid for the –

MR. MEANEY: Yes.

MR. LEARMONTH: – for the EPCM contract –

MR. MEANEY: Yeah and –

MR. LEARMONTH: – which was subsequently awarded –

MR. MEANEY: No, I wouldn't have been involved in that process –

MR. LEARMONTH: Right.

MR. MEANEY: – but, you know, I did find out, I think, one of the project management guys had told me that they had been involved, yes.

MR. LEARMONTH: Okay.

And so the reason for the – for this procedure, that you retain the independent engineer first, is to get a head start on the work, is that correct?

MR. MEANEY: Correct.

And actually, I think you –

MR. LEARMONTH: Yeah.

MR. MEANEY: – read it there. It was stated –

MR. LEARMONTH: Yeah.

MR. MEANEY: – in the scope of –

MR. LEARMONTH: To get a jump on it. Because if you waited until everything was lined up with, in this case, the guarantor or the lenders –

MR. MEANEY: Yes.

MR. LEARMONTH: – you would have lost a lot of time.

MR. MEANEY: Yes.

There – I mean, in terms of what the – the timeline that was gonna be – that was being contemplated to financial close, and knowing that the volume of information that the independent engineer had to review, exactly. Get out ahead of it and let them have the time to go through that information so that when, you know, the lenders or the guarantor were put in place and financial close was able to happen, they would be able to give good advice, I guess, to the guarantor.

MR. LEARMONTH: Yeah. And are these arrangements that you just described industry standard as far as you know or are they unique to this situation?

MR. MEANEY: No, they're not unique to our project. I know there has been other precedents where, you know, borrowers have gone out and done as we did to get ahead of things, yes.

MR. LEARMONTH: Okay.

MR. MEANEY: And I think Mr. Argirov might have confirmed that in his testimony on Tuesday as well.

MR. LEARMONTH: I just wanted to see your knowledge 'cause you're a CFA. You'd probably know a little bit about that, right?

MR. MEANEY: He would know more about independent engineering services than I would, but yes, I know a little bit about financing.

MR. LEARMONTH: All right, thank you.

Anyway, on the same exhibit, P-02392, I'd like you to turn to page 95.

THE COMMISSIONER: Tab number?

MR. LEARMONTH: That's the same tab, 98.

THE COMMISSIONER: 95.

MR. LEARMONTH: It's in the same document that's right before you.

MR. MEANEY: Okay.

MR. LEARMONTH: Okay. Do you see that's the Reliance Agreement?

MR. MEANEY: Yes.

MR. LEARMONTH: 4th of June, 2013?

MR. MEANEY: Yes.

MR. LEARMONTH: Can you – I know – I'm not going to ask you for a legal interpretation. Can you give me your general overall understanding as to what the purpose of this agreement is and what –

MR. MEANEY: Sure. Sure.

MR. LEARMONTH: – what it accomplishes?

MR. MEANEY: Yeah, and I'll give you a bit of background as to why it was required.

So in the federal loan guarantee agreement that was executed in November of 2012, there was a couple of key provisions in that. One related to specifically the independent engineer. And it stated in that that the independent engineer was gonna be engaged to act on behalf of the guarantors or the lenders. And at that point in time we didn't know exactly what the financing structure was gonna be so we used both lenders and guarantors in the document.

And then also there was gonna be a requirement for the independent engineer to produce the independent engineer's report for financial close, which had to be confirmed or approved by the guarantor or the lender.

So following the execution of that agreement in November 2012, the relationship obviously needed to transfer from Nalcor to Canada. And the Reliance Agreement – the initial one signed in June of 2013 – was the contractual means by which that was accomplished.

MR. LEARMONTH: Right.

MR. MEANEY: So basically it said that, you know, through these arrangements, Canada can rely on the independent engineer to provide the services that were contemplated in the federal loan guarantee agreement. It was initially executed – I think this one was referred to as the Interim Reliance Agreement because it was executed with Nalcor, who had initially retained the services of the IE, and then there was going to be a subsequent reliance agreement signed as part of financial close in November of 2013 once the new Muskrat Falls companies were set up.

MR. LEARMONTH: Yeah.

MR. MEANEY: And I think there's another reliance agreement that (inaudible) –

MR. LEARMONTH: Yeah, we'll get to that.

MR. MEANEY: Okay.

MR. LEARMONTH: But they – obviously they couldn't be parties to it –

MR. MEANEY: Because they didn't exist.

MR. LEARMONTH: – in June because they didn't exist at that time.

MR. MEANEY: Exactly.

MR. LEARMONTH: And just to confirm, if you go to page 100, 101 and 102 of the document Exhibit P-02392, can you confirm those are the signature pages for the parties to this agreement?

MR. MEANEY: Yes, so they were Nalcor, MWH and then the Government of Canada on the last page. That's right.

MR. LEARMONTH: Okay.

Then if we turn, in the same exhibit, to page 120.

MR. MEANEY: One, twenty.

MR. LEARMONTH: This is a reliance agreement dated November 29, 2013, between a number of particular subsidiaries – wholly owned subsidiaries of Nalcor, is that correct?

MR. MEANEY: That's right. That's right.

MR. LEARMONTH: And that's the – so this is November 29, 2013, the day of financial close –

MR. MEANEY: Correct.

MR. LEARMONTH: – and this is just to – it's the same type of reliance agreement except there's different parties to it, because those entities were now created.

MR. MEANEY: Exactly. So, as I mentioned, the one in June was always intended to be an interim reliance, and this was the long-term one.

MR. LEARMONTH: Yeah.

MR. MEANEY: So, you know, it became, as you said, the parties for the financing itself, because the independent engineer was a requirement of the financing.

MR. LEARMONTH: Yes.

Okay, the next document I want you to turn to in this exhibit, P-02392, is at page 103.

Do you see that?

MR. MEANEY: Yes, I do.

MR. LEARMONTH: Okay. Now, this is – can you explain – okay, this is dated July 21, 2014.

MR. MEANEY: Yes.

MR. LEARMONTH: So this is well after financial close.

MR. MEANEY: Yes.

MR. LEARMONTH: Can you identify this – the document I just referred you to?

MR. MEANEY: Sure.

So this was a – the folks from the Government of Newfoundland, and I believe it was primarily the folks on the Oversight Committee, primarily, wanted to have access to the independent engineer, in terms of getting the information that he was providing, in terms of being able to participate in site meetings or conference calls with the independent engineer. And I believe this is spelled out in parts 1, 2, 3 and 4. And, also, to have the ability to ask the independent engineer questions, as part of the role that they are fulfilling in the Oversight Committee.

But what it does explicitly state is under part 5: "the Province acknowledges that any reliance" – they – "placed on the reports and information provided as a result of the access to the Contractor granted by this letter is at their sole risk and without liability to the Contractor or Canada …."

MR. LEARMONTH: Yeah. And that's on page 104.

MR. MEANEY: Page 104, yes.

MR. LEARMONTH: Yeah.

MR. MEANEY: So even though, I guess, there was this arrangement put in place with the Province of Newfoundland, the client for the independent engineer remained the Government of Canada –

MR. LEARMONTH: Yes.

MR. MEANEY: – and this just gave the ability for folks from the Government of Newfoundland to ask questions and get information.

MR. LEARMONTH: Can you confirm that, to the best of your knowledge, the Province of Newfoundland and Labrador did not, at any time before this document was signed on July 21, 2014, ask to have access to the work and reports of the independent engineer, to the best of your knowledge?

MR. MEANEY: There would've been some information that they were looking for in 2013.

MR. LEARMONTH: Yeah. That was July 16?

MR. MEANEY: Yeah. It was –

MR. LEARMONTH: Yeah.

MR. MEANEY: – July 2013, yes.

MR. LEARMONTH: Yeah.

MR. MEANEY: And we would've received a draft of the – one of the drafts of the independent engineer report at that point in time –

MR. LEARMONTH: That being the July 2013 report, correct?

MR. MEANEY: Correct.

MR. LEARMONTH: Yeah.

MR. MEANEY: And, I guess, it was a couple of weeks prior to that we had had a meeting with some folks who were representatives of the Government of Newfoundland from Finance and Natural Resources. And in that discussions, of course, they were aware, as part of the federal loan guarantee arrangements, that the independent engineer was going to be producing a report. And they had asked that once we received a draft report that we provide it to them. So we did receive that report in the middle of July of 2013 and then we did post that draft to the data room – the Intralinks data room, which Newfoundland representative, Canada, Nalcor and some of the lawyers all had access to.

MR. LEARMONTH: Okay.

So you're – was it – I believe you told me, earlier in the interview, that it was Charles Bown who first asked for the report –

MR. MEANEY: No, in the meeting that we held in June of 2013 with representatives of government, I don't – Charles was not in that meeting. It would've been Laurie Skinner who was the deputy minister of Finance at that point in time and then there would've been a gentlemen, Paul Morris, who was – I think Paul, at that point in time, was an assistant deputy minister of Natural Resources, so he would've worked for Charles.

MR. LEARMONTH: All right. Well – so you got this verbal request to give the Province of Newfoundland and Labrador access to the July 2013 draft report of the independent engineer, correct?

MR. MEANEY: Yes.

MR. LEARMONTH: And you gave – through your system, your data room system, you gave the Province of Newfoundland and Labrador access to that one report, is that correct?

MR. MEANEY: We gave them that draft, the July draft, yes.

MR. LEARMONTH: Yes, to that report.

MR. MEANEY: Yes.

MR. LEARMONTH: And after – do you know – and I don't want you to speculate. Do you know whether the Province of Newfoundland ever took advantage of that opportunity to look at the July 2013 report?

MR. MEANEY: I don't know.

MR. LEARMONTH: You don't know?

MR. MEANEY: No.

MR. LEARMONTH: So there were no communications about the draft report between you or anyone, to your knowledge, at Nalcor and the government of –?

MR. MEANEY: I don't recall hearing anything subsequent to us posting the draft report.

MR. LEARMONTH: Yeah. So it's – okay, that's all you can say on that.

But after you posted the July report on the – in the data room with access given to the Province of Newfoundland and Labrador, and that was on July 16, 2013, did you ever at any time up until financial close – or we'll say December 13, that's the date the funds were advanced, did you ever receive any request – any other request from the Province of Newfoundland for additional information?

MR. MEANEY: They wouldn't have made any specific requests for documents. I do know that on a weekly basis, I think it was every Monday, we would have a call with Nalcor and Government of Newfoundland folks –

MR. LEARMONTH: Who's we?

MR. MEANEY: It would've been the folks from the Nalcor finance team, predominantly. So myself –

MR. LEARMONTH: So you?

MR. MEANEY: Myself, Derrick Sturge, Auburn Warren, Rob Hull. There was a core group of us on the finance team. So we would've had a call with folks from the Government of Newfoundland; it would've been primarily folks from Natural Resources, Justice and Canada.

And what these were was after the federal loan guarantee agreement was signed in November of 2012 we set up a process of weekly checkpoint calls. So we typically have a call on the Monday with the Nalcor and Newfoundland team and then there would be a call, I think, on Tuesdays and Thursdays with the broader group, which would've included Nalcor, Newfoundland, as well as Government of Canada folks, folks from Emera. All the folks who were involved in the federal loan guarantee process.

And the focus of those discussions would've been there was various conditions precedent that were outlined under that federal loan guarantee agreement. There was conditions precedent that the provinces, Nova Scotia and Newfoundland, had to satisfy. There was conditions precedent that Nalcor had to satisfy and as well as Nova Scotia – or Emera, sorry. So as – and one – of course, as I mentioned earlier, one of the conditions precedent in that agreement was the delivery of an independent engineer report, and both we and Emera had to do that.

So as part of those weekly calls, I'll say, there would've been updates on what was going on with the independent engineer report and that CP, but in terms of, I guess, specific requests for documents, the only one that I recall prior to financial close would've been the draft that we posted to the data room.

MR. LEARMONTH: In July 2013.

MR. MEANEY: Correct.

MR. LEARMONTH: Now these weekly calls that you referred to, do you have any record of, number one, who participated in these calls, when these calls took place and what was discussed during these calls?

MR. MEANEY: I think you would – probably, if I went back into my calendar, in my email, you'd still see the meeting invites were in there, so that would, I would expect, include all the folks who were – are participants to those discussions.

MR. LEARMONTH: Are those available? I haven't seen those.

MR. MEANEY: Yes, I think they would be available, yes.

MR. LEARMONTH: Can you get them for us?

MR. MEANEY: Sure, we can take that as an action item to pull that information together.

MR. LEARMONTH: Okay.

MR. MEANEY: And it would've been set up, I'll say, in the earlier part of 2013. It would've been a recurring call, so it would've been the same group of folks. It would've been a conference bridge; folks who were in different places would've dialled in for it.

But yes, I think if you check my calendar, you'd be able to see who the attendees for those calls were.

MR. LEARMONTH: But are there any minutes of these calls – any records, any emails, summaries of what was said?

MR. MEANEY: There – I don't specifically recall if anyone, kind of, took minutes. I think in my notes – at least in my notes and maybe notes of others, such as Derrick, some of which I understand have been provided, you might see some of the commentary in terms of what was the updates from the call from Canada, from Newfoundland, from –

MR. LEARMONTH: But do you have any records?

MR. MEANEY: I think if you were to go into my notes, that there would probably would have been – some of the calls I would've taken notes in terms of the status of various items.

MR. LEARMONTH: Okay, I just, before I (inaudible) – you've used the term at least once: I do not specifically recall. Is there any difference between I do not specifically recall and I don't recall?

MR. MEANEY: No, sorry –

MR. LEARMONTH: Okay.

MR. MEANEY: – no. I –

MR. LEARMONTH: Okay, so that –

MR. MEANEY: I'll use simple –

MR. LEARMONTH: I just wanted to –

MR. MEANEY: – terminology.

MR. LEARMONTH: – get that clarified at the beginning. So there's no difference. What you –

MR. MEANEY: No.

MR. LEARMONTH: – mean is you don't recall.

MR. MEANEY: Right, exactly, sorry.

MR. LEARMONTH: Okay. No, that's fine.

So is there any – you know, there were a number of draft reports. There was a report March 2013; there was a – this is the engineer's report I'm referring to – there's a report in July, the one we just referred to, and that's –

MR. MEANEY: Yeah.

MR. LEARMONTH: – you say that's the only one you gave to Newfoundland and Labrador. There was another report in October 2013; there was another report November 15, 2013; there was another report on November 29 – 27, 2013. And all those reports were received by Nalcor, is that correct?

MR. MEANEY: Yes, they would've been received by Nalcor, as well as the folks from the Government of Canada as well.

MR. LEARMONTH: Yes.

Is there any reason why, after receiving these reports, you didn't send them to the Province of Newfoundland and Labrador?

MR. MEANEY: No specific reason.

MR. LEARMONTH: But – so that's your answer, no reason?

MR. MEANEY: We – I mean, the folks in the province would have been aware that we were working with Canada and the independent engineer on the draft report. That would have been – as I mentioned, as part of the weekly call, we would have been giving a status update. They would have been aware as the process unfolded – and I think there was some correspondence on that – what were kind of the – as the process evolved what were the key issues in the report that were being worked through in order to finalize it.

So there would have been discussion of that in these weekly check-in calls in terms of the status of how things were progressing with the IE report and what some of the key issues were. There would have been some correspondence, I think, updates, probably. I believe – I do recall a couple of emails from Derrick Sturge when he kind of gave a status update to our CEO and Charles Bown at the time –

MR. LEARMONTH: When was that?

MR. MEANEY: I do recall an email around November – specifically I recall an email around the 25th of November that –

MR. LEARMONTH: Right.

MR. MEANEY: – would have gave a status update, and I believe it was titled 5:45 p.m. update or business issues update.

MR. LEARMONTH: Yeah.

MR. MEANEY: And he would have gone through the list of the various key items, and in that would have been the IE report in terms of –

MR. LEARMONTH: Okay.

Go ahead.

MR. MEANEY: In terms of, you know, here's what the status –

MR. LEARMONTH: Yeah.

MR. MEANEY: – and the teams are working together to resolve them. So there would have been certainly, you know, periodic updates through that period of July, August, September, October, November, where folks from the province were aware that we were working with Canada and the IE to finalize the IE report. But

there was no – I don't – I can't recall why we specifically wouldn't have provided a draft. They never asked for it, and I think they were content with getting the updates from us in terms of what was going on.

MR. LEARMONTH: So they never asked for copies of the reports which they knew you were receiving, correct?

MR. MEANEY: Not through the period post-July 2013.

MR. LEARMONTH: Well, if there's – if – the July 2013 report was a draft.

MR. MEANEY: Yes.

MR. LEARMONTH: So it follows, does it not, logically that if that's a draft, that there's gonna be subsequent reports?

MR. MEANEY: That there would have been a final report.

MR. LEARMONTH: Well, a subsequent reports or report.

MR. MEANEY: Sure. Yes.

MR. LEARMONTH: Yeah.

Okay. So you didn't – the Province of Newfoundland and Labrador didn't ask for these additional reports after July 2013 and you didn't offer them. Is that right?

MR. MEANEY: Correct.

We would have been giving them updates on the –

MR. LEARMONTH: Yeah.

MR. MEANEY: – status. But yeah, we wouldn't have –

MR. LEARMONTH: Well, no. Updates on status, what do you mean by that?

MR. MEANEY: In terms of –

MR. LEARMONTH: And first – before you answer that.

MR. MEANEY: Sure.

MR. LEARMONTH: Do you have any – when you talk about updates on status, do you have any records that will show what these updates on status consist of? Do you have any records?

MR. MEANEY: I can't think of any specific spots. What I would have, Mr. Learmonth, in my notes would be, you know, a note listing all kind of – the items that were discussed in one of these progress calls in terms of the commentary that might've been provided on a specific item. There may have been some on different ones. I don't recall if I had specifically wrote down, you know, what the update we gave on a certain date on the IE report was. But I do recall it was – there was regular weekly calls discussing the status of the conditions precedent under the –

MR. LEARMONTH: Hmm.

MR. MEANEY: – federal loan guarantee agreement. And the IE report would've been one of them.

MR. LEARMONTH: That's just only one of the conditions precedent.

MR. MEANEY: One of many precedents.

MR. LEARMONTH: Yeah.

Okay. Well, tonight, will you check your notes and see if you can find the references that you may have made to these telephone calls, weekly telephone calls with the Government of Newfoundland in relation to the work of the independent engineer?

MR. MEANEY: I can certainly look. Maybe – would it be helpful if we took a shortened time period? Like, would be the period –

MR. LEARMONTH: Okay, well, let's take from – for 2013, let's take from January 1, 2013, to the end – the calendar year 2013, let's say.

MR. MEANEY: I'll go through my notes and –

MR. LEARMONTH: Yeah, and see what you find.

MR. MEANEY: That will take some time –

MR. LEARMONTH: Yeah.

MR. MEANEY: – but yes, I'll go through my notes.

MR. LEARMONTH: Yeah. And you'll do that tonight, will you?

MR. MEANEY: I will try.

MR. LEARMONTH: All right. Well, they're not that long. I mean, I think I've seen – or anyway, you do your best on that. I appreciate that.

Now, when you talk about update status reports, I mean, these reports are – well, they are hundreds of pages over –

MR. MEANEY: The independent engineer –

MR. LEARMONTH: Yeah.

MR. MEANEY: – report.

MR. LEARMONTH: Yeah.

MR. MEANEY: Yes.

MR. LEARMONTH: So is there any way in a meeting when you couldn't give a comprehensive account of the – of what was said in these reports with respect to contingencies, cost estimates, schedule and so on? I mean, is that possible?

MR. MEANEY: No. And we wouldn't – as part of those update calls, we wouldn't have been going down to that level of explaining to folks what were the, you know, the – some of the key terms and language in the IE report. It would've been more – so say, for example, in November there was probably five or six key sections or key issues within the report that everyone was focused on. So we would've been letting folks know: Listen, these are the key focus areas we're working through –

MR. LEARMONTH: Okay, what are the key focus areas –

MR. MEANEY: So –

MR. LEARMONTH: – that you remember –

MR. MEANEY: Sure.

MR. LEARMONTH: – telling the people, the representatives of the Government of Newfoundland and Labrador in these weekly telephone calls?

MR. MEANEY: We probably would've talked about –

MR. LEARMONTH: Well, before you say probably, I want you to know – first, I want you to tell me what you can actually recall, not what you probably …

MR. MEANEY: I can certainly recall that we would've been seeing discussions on a cost contingency and schedule and probably some discussion on Astaldi and as well as questions they had on the North Spur. As we kind of got down to the final stages, those were the four or five key topics –

MR. LEARMONTH: Yeah.

MR. MEANEY: – that were the focus of the independent engineer.

MR. LEARMONTH: Yeah.

Well, anyway, maybe your notes will – this is a long time ago. So maybe your notes will confirm what you're telling us now.

MR. MEANEY: I'd have to look, yes.

MR. LEARMONTH: Yeah, because we're talking about over five years ago, correct?

MR. MEANEY: Yes. Yes.

MR. LEARMONTH: Yeah. And –

MR. MEANEY: And I do recall – sorry, Mr. Learmonth. I do recall – and I think that email that I did mention, the one from Derrick Sturge, I think – I do recall in his list of status on the various CPs there was a point on the IE report, and I think the subjects I just mentioned were noted in his email.

MR. LEARMONTH: Hmm. Well, did – if you discussed contingencies with the Province of Newfoundland, can you tell me what the

response is you got? Because in every draft IE report – well, perhaps not the earlier two, but in the October – November 15 and November 17 there's some very pointed comments on contingencies.

MR. MEANEY: Yes.

MR. LEARMONTH: The comments vary. They're – they shift from report to report. But there's some very pointed comments that say, generally, that the contingencies are too low. Now, are you saying you told the Province of Newfoundland that in these calls?

MR. MEANEY: They would've –

MR. LEARMONTH: No, do you remember telling them that?

MR. MEANEY: I – no.

MR. LEARMONTH: No, okay.

Well, I put to you that if you – if Nalcor had wanted to keep the Province of Newfoundland in the loop and up to date about the work of the independent engineer, that you would've sent the draft reports to the Province of Newfoundland and Labrador because they're the ones that are – on behalf of the taxpayers that are funding this project, and there's very important information on the cost estimates in those. Why did you not send the draft reports – all the draft reports – to the Province of Newfoundland, given the importance of this to the Province?

MR. MEANEY: The July draft that they did receive would've had much of the commentary you're referring to.

MR. LEARMONTH: Well, you know, but – okay, fine. What about the other ones?

MR. MEANEY: I think if you look at the – I guess the iterations of the draft, there was some variation, but a lot of the key themes that were in the July draft would've carried through into the October or November drafts as well.

MR. LEARMONTH: Are you sure about that?

MR. MEANEY: I think – there was some variation in the language, but I do know – I do recall in the July draft, I mean, they did talk about the range of potential outcomes. There was some commentary about contingency in that document. Some of the percentages might've been a bit different in terms of where things landed in the final report. But the – I think the general themes were generally consistent.

MR. LEARMONTH: Okay. Let's assume that that's the case. We can check that.

But please answer my question, which is why – given the importance of this to the Province and the people of Newfoundland and Labrador from a financial point of view, risk exposure – why did Nalcor not send all of the draft reports which it received from the independent engineer, to the Province of Newfoundland and Labrador? Why not?

MR. MEANEY: I don't recall why we didn't, or why we did not.

MR. LEARMONTH: I suggest that if you had wanted to keep the province well informed that you would've done that.

MR. MEANEY: I don't think – at least – I'll speak from my perspective. There was no intention to not inform the province as part of that.

MR. LEARMONTH: But the result of your not providing the reports is that the province was not informed. Do you agree with that?

MR. MEANEY: They may not have been informed on the various updates in terms of the language of the report, but I think the key themes that they would've – assuming that they read the July 2013 report, they would've seen the key themes that were highlighted by the independent engineer.

MR. LEARMONTH: You're saying they may not have been informed. Don't you mean that they weren't informed because they didn't receive the reports?

MR. MEANEY: They wouldn't have seen the subsequent drafts between July and then the interim final report on November 29.

MR. LEARMONTH: But – and you can't offer any explanation – I'll ask you for the last time – you can't offer any explanation, I take it, why these important reports were not sent by Nalcor to the Government of Newfoundland given the fact that the people of Newfoundland and Labrador were on the hook for the cost of this project?

MR. MEANEY: No.

MR. LEARMONTH: You don't have an answer for that? Okay.

The next document I want to refer to you is in tab – it's in volume 3, tab 54 of your documents. This is – it's Exhibit P-02340.

MR. MEANEY: Mr. Learmonth, if I could add a point on the discussion we just had? If you wouldn't mind.

MR. LEARMONTH: By all means.

MR. MEANEY: I recall – I guess to maybe answer your question – I recall we received the draft report in July –

MR. LEARMONTH: 2013, yeah.

MR. MEANEY: – of 2013, yes. I recall sending an email – and I think this might have been an email we reviewed in my interview – off to the guys on the project team – so that would have been Gilbert and Paul Harrington and some of these guys – to let them know that the province had requested a draft of the report and that there was commentary in the report relating to contingency and cost estimates.

And I do remember suggesting to those guys that they, you know, they should have a discussion with Ed in terms of his engagement with the province, that he has a heads-up that this commentary is in there and there may be something – that he may want to talk to the province about that. And that was the only other piece, sorry, that I could add that –

MR. LEARMONTH: Well why would it be necessary to get – you know, to have Ed Martin's involvement in this? I mean you're dealing with the Government of Newfoundland. You're dealing with senior bureaucrats. You're giving them updated information as – which you just mentioned – on a weekly basis. Why would you have to get the permission or consent or approval of Ed Martin to send these reports? I would have thought that would have been a routine matter.

MR. MEANEY: No – I guess I raised the point in terms of the folks who were accountable for the cost estimate and the contingencies within that –

MR. LEARMONTH: Mm-hmm.

MR. MEANEY: – and the folks, I guess, who would have had individual – who would have ultimate sign-off on deciding what the cost estimate and the contingency amount was – which was the CEO. I wanted to make them aware of that, that they may want to have a discussion with the folks of the province. Because it was –

MR. LEARMONTH: Before you sent the draft report.

MR. MEANEY: Yeah. The July one. You just, you know – I gave them that we've received this – it's going to be going over to the province. There's some commentary here on contingency. You know, you guys asked the folks who were accountable for the cost estimate and the contingency. You might want to have a discussion with the CEO and then if he needs to have a discussion with folks in the province.

So this is one piece of information I wanted to add to –

MR. LEARMONTH: Yeah –but – okay – just – all right. If you're giving information to the Province of Newfoundland and Labrador about cost estimates, contingencies – well, for the sake of argument – we'll accept – and only for that purpose – we'll accept that as being the case. If you're giving them to – in verbal telephone conversations – weekly telephone conversations – why is it that you can't just send the report to them when you receive it – to those same people that you're keeping up to date – without getting the approval or permission or heads-up to Ed Martin – why?

MR. MEANEY: I don't think, you know – it wasn't so much about approval – it was just to let him know 'cause he was, I guess, one of the primary points of contacts with folks, you know, senior levels of the province –

MR. LEARMONTH: Yeah.

MR. MEANEY: – just to let them know.

MR. LEARMONTH: Well why would you have to see fit to let them know? Shouldn't it be just a routine transmittal? The province is putting out the money for this. You get out your draft report. You are having ongoing discussions with them every week. There's the report. Read it yourself. Why wouldn't you do that?

MR. MEANEY: We didn't.

MR. LEARMONTH: And you have no explanation as to why you didn't accept that. I take it the province never asked for it. Is that it?

MR. MEANEY: We – yeah. They wouldn't have asked and we were giving them the status updates and I don't recall why we would not have transmitted the report.

MR. LEARMONTH: Do you not agree that there was a duty on Nalcor – perhaps not a legal duty but a moral duty – on Nalcor to keep the Province of Newfoundland up to date on cost estimates that were contained in the draft independent engineer's reports? Did you not feel that there was a duty on you to do that – to make sure they knew what was going on?

MR. MEANEY: They would have been aware of what the cost estimate was that the IE was looking at, which would have been the 6.2. You know, up until early November. And in that information, of course, the Decision Gate package there would have been information on what the contingency was included in that amount.

MR. LEARMONTH: That's at – that's the DG3 numbers.

MR. MEANEY: Yes. The DG3 numbers.

MR. LEARMONTH: Yeah. But I'm not talking about the DG3 numbers. I know the Government of Newfoundland had the DG3 numbers but the contents of the draft independent engineer's reports raised a question as to whether the contingency in the DG3 numbers was adequate. And the conclusion throughout was, in the opinion of the independent engineer, it wasn't – it was inadequate.

MR. MEANEY: Yes. He did indicate that it was on the low end of their range and then, you know –

MR. LEARMONTH: Yeah.

MR. MEANEY: Yes.

MR. LEARMONTH: But you did not feel duty bound to give this information – the black and white hard copy or send it by email – to the Province of Newfoundland.

MR. MEANEY: We didn't.

MR. LEARMONTH: You didn't feel under a duty to do that, is that right?

MR. MEANEY: We didn't provide the information.

MR. LEARMONTH: Did you feel you were under a duty to and didn't do it or did you feel you weren't under a duty to do it?

MR. MEANEY: I think – I'd probably say Nalcor, as an organization, had a duty to inform the province of information that would have been relevant.

MR. LEARMONTH: And by not providing the draft independent engineer's reports, you agree with me that that duty was not discharged?

MR. MEANEY: There may have been means – other means through which the province was informed on the information in the IE report, and I guess one means to do it would have been to provide them with the drafts and it wasn't –

MR. LEARMONTH: Yeah, but, the – that's not my question. My question is do you agree that having decided not to provide these draft independent engineer's reports to the government, that Nalcor failed to discharge the

duty that it owed to the government on behalf of the people of Newfoundland and Labrador? Do you agree?

MR. MEANEY: I don't know if you would say providing drafts of reports would be the only means by which –

MR. LEARMONTH: No, no. I'm talking about the draft reports. We'll talk about other things later. But please answer the question.

MR. MEANEY: I think providing the draft reports would have been one component of Nalcor providing – acting in its duty to provide information to the government.

MR. LEARMONTH: And because it didn't provide the draft reports, it failed in that aspect of its duty. Do you agree?

MR. MEANEY: It didn't provide information to the government.

MR. LEARMONTH: And do you agree that it failed in its duty to do that? Yes or no?

MR. MEANEY: It didn't provide the draft documents.

MR. LEARMONTH: Okay, you can – we can stand here until either you answer the question or until the Commissioner tells me that it's not a proper question.

So by not answering – and you're not, I suggest – it's just gonna prolong things.

The question was: In failing to provide to the Province of Newfoundland all of the draft reports of the independent engineer, do you agree that Nalcor breached its duty to provide relevant information on the Muskrat Falls Project to the Province of Newfoundland and Labrador? Yes or no?

MR. SIMMONS: Commissioner, the question is asking for a conclusion rather than anything factual or any information that Mr. Meaney can directly give. It's a conclusory opinion that's being requested, so I think it's a legitimate point as to whether or not this is an appropriate question for Mr. –

MR. LEARMONTH: Well –

MR. SIMMONS: – Meaney to have to express his view on.

MR. LEARMONTH: Well – may I respond?

THE COMMISSIONER: Go ahead.

MR. LEARMONTH: As far as I'm concerned – number one, I'm not withdrawing the question, and number two, I think it's an entirely proper question.

I will, of course, withdraw the question, Commissioner, if you decide that it's an inappropriate question, but only then. Otherwise, I'll ask him again, again and again.

THE COMMISSIONER: This is a question that, perhaps not asked in the same language, has been asked to other witnesses in Phase 1. I think it's a question that's a fair question to be put to the witness and I think the witness can answer the question.

I think he understands – he's already indicated that he understands that Nalcor was under a duty to provide relevant information to the Province of Newfoundland and Labrador, and he's agreed that the other draft reports after July were not provided to the Province of Newfoundland and Labrador, and the question that he's being asked to answer is: So by failing to provide those reports to the Government of Newfoundland and Labrador, did the government – did Nalcor breach its duty to disclose relevant information?

I think it's a fair question to ask and I'd like to know his answer. And it is a yes or no answer.

MR. MEANEY: Sure.

If it was – if it were deemed to be that providing those reports would be part of the duty of obligation, you know, of Nalcor to provide them, and the fact that, I guess, the drafts weren't, then if you follow –

MR. LEARMONTH: (Inaudible.)

MR. MEANEY: – down the road, I guess the answer –

MR. LEARMONTH: Mmm.

MR. MEANEY: – would be yes.

MR. LEARMONTH: Well, the question – I want an unqualified yes or no.

The Commissioner just said you can answer that yes or no, and what you're doing is you're giving a qualification – qualified yes. I want a yes or a no.

THE COMMISSIONER: Maybe we should go about it this way: Do you see the relevance of the draft reports and providing knowledge in that the contents of those draft reports, you see the – do you see that that would be a relevant group of documents that should've been provided to the Government of Newfoundland and Labrador?

You provided one at their request. So you knew that they were looking for it. There were subsequent drafts coming after this. I mean, it …

MR. MEANEY: Commissioner, I will answer the question, but I'll just provide a little bit of context –

THE COMMISSIONER: Okay.

MR. MEANEY: – (inaudible).

MR. LEARMONTH: I don't want any context. I want an answer.

MR. MEANEY: No, I –

THE COMMISSIONER: (Inaudible) – let's let (inaudible) –

MR. MEANEY: Well, I would like to provide the Commissioner – and then I will. I will answer your question.

MR. LEARMONTH: Okay, fine.

MR. MEANEY: So I guess as the drafts were coming in in the November period – of course from the period of, you know, November 1 through to November 29, that was obviously a, you know, an extremely busy period in terms of everyone pulling together information that was needed to achieve financial close. And the independent engineer's report was – as we talked about earlier – one of many conditions precedent that needed to be satisfied in order to achieve financial close.

There was, you know, information that – CPs that the province had to satisfy, Nalcor had to satisfy and others. So, you know, this was one piece of work that a large number of people were working on. And through that period there was a lot of documents flowing back and forth with Canada, with Newfoundland, with Nalcor. You know, there was a lot of other documents relating to the financing, for example, the legal agreements – all these other documents that were definitely flowing back and forth between Canada – or, sorry, Newfoundland and Nalcor.

And in that period – I guess particularly in November, as Mr. Learmonth noted – there was a number of turns of the IE report and drafts of the IE report. So we were receiving those, having to turn comments around very quickly, get them back to the independent engineer. They were in turn reviewing them, asking more questions, and then, as we got out of bidding in later September, you know, a revised draft did come as Mr. Learmonth noted.

So in terms of specifically, you know – including that independent engineer report in the transmittal of a document that went to the province, no, we didn't put across those subsequent drafts. But it's because they were being worked on in in such a tight time frame, along with others, that while we were keeping folks aware of the progress on the IE report, you know, that document didn't go across.

Many others did, in terms of the financing agreements and the commitments that the province would have to make. And I would say, you know, those were equally important in terms of understanding what the commitment that the province had to make. But those documents did not go across.

So I would say that in terms of Nalcor meeting its duties to the province in terms of many other pieces of information relating to the financing and the federal loan guarantee and whatnot, there certainly was a lot of documents that did flow across, and there was, you know, full disclosure on that. Those drafts – the number of drafts that were going through November did not

go across to Newfoundland. So in terms of, specifically, our obligation to provide that piece of information, Nalcor didn't provide it.

MR. LEARMONTH: Okay. And do you – okay, so that's your background.

So I'll come back to the question, and I want a yes or no answer, please.

MR. MEANEY: Okay.

MR. LEARMONTH: In failing or in deciding not to provide all draft reports from the independent engineer to the Province of Newfoundland, do you agree that Nalcor breached or failed to discharge its duty to disclose to the Province of Newfoundland and Labrador all relevant information in relation to the work of the independent engineer? I'd like a yes or no answer.

MR. MEANEY: The information that was in those drafts, yes.

MR. LEARMONTH: Well the reports. You agree that there was a breach of the duty by not providing that – the drafts to the province, yes or no?

MR. MEANEY: The reason I'm hesitating is, I guess the term you're using in terms of breach of duty, that seems, Commissioner, I – it's almost – it seems to me to be a legal type question, and that's my only reason I'm hesitating, is that, you know, is –

MR. LEARMONTH: Okay, I'll say it's not legal.

THE COMMISSIONER: Just one second now. So let me put this into perspective, so we can move on because I don't want to spend too much more time on this. I think I'm getting adrift.

So you already said that Nalcor was providing a significant amount of other documents, at this time, that were necessary for the federal loan guarantee to go through. The IE reports were obviously another one of those condition precedents to get done.

And from what you just said to me – from what I am basically taking from your answer – because it's really just a question; it's not – we're not talking about legalities, we're talking about an obligation – a moral obligation, whatever it is, to provide all relevant documents. So if the other documents that were conditions precedents were provided – the precedents were provided, and I assume these draft reports would be considered to be relevant, then they, too, should have been provided. That's an answer: yes or no.

MR. MEANEY: In hindsight, yes, they should –

THE COMMISSIONER: Perfect.

MR. MEANEY: – have been provided.

MR. LEARMONTH: Okay.

THE COMMISSIONER: Okay.

MR. LEARMONTH: Okay. Thank you.

THE COMMISSIONER: So we're at a time now –

MR. LEARMONTH: Yeah.

THE COMMISSIONER: – where I'd like to look at, if we can before you move to the next –

MR. LEARMONTH: Okay.

Can I just finish this example –

THE COMMISSIONER: Sure.

Go ahead, yeah.

MR. LEARMONTH: – which I brought up? It'll just take a minute –

THE COMMISSIONER: Sure. Go ahead, yeah.

MR. LEARMONTH: – just to identify it. All right.

Mr. Meaney, tab 54, volume 3, and this is brought up on the screen here as P-02340. It's an acknowledgment.

Can you – just to complete the records in relation to the Reliance Agreements and so on,

can you identify this July 21, 2014 document, which is dated the same day as the reliance letter that Newfoundland obtained. Can you –

MR. MEANEY: Yeah.

MR. LEARMONTH: – just identify this?

MR. MEANEY: This would have been an acknowledgment from Canada that the NLIE Reliance Agreement was executed and that the terms under it were agreed to.

MR. LEARMONTH: Yeah.

And this is in – this is shortly after the time that the Oversight Committee was established.

Is that correct?

MR. MEANEY: Yes, I think it was 2014 when the Oversight Committee was first established.

MR. LEARMONTH: Yeah. I think in March 2014.

Anyway, so that's the end of that exhibit.

So if you would like to take a break now, that would be –

THE COMMISSIONER: Yeah.

MR. LEARMONTH: – fine for me.

THE COMMISSIONER: So I'm just trying to get a feel for where we're going tomorrow because it is Friday.

So, do you think it's prudent that we start at 9 o'clock?

MR. LEARMONTH: Well, yes. I do.

THE COMMISSIONER: Okay.

All right.

So we'll start at 9 tomorrow morning then.

All right. Thank you very much.

Adjourned until (inaudible).

CLERK: All rise.

This Commission of Inquiry is concluded for the day.