



COMMISSION OF INQUIRY RESPECTING THE MUSKRAT FALLS PROJECT

Transcript | Phase 1

Volume 36

Commissioner: Honourable Justice Richard LeBlanc

Tuesday

13 November 2018

CLERK (Mulrooney): All rise.

This Commission of Inquiry is now open.

The Honourable Justice Richard LeBlanc
presiding as Commissioner.

Please be seated.

THE COMMISSIONER: All right. Good morning.

I trust everyone had a good weekend.

Mr. Learmonth?

Just one second now.

MR. LEARMONTH: I'd first like to enter the following –

THE COMMISSIONER: You can just be seated there for (inaudible) –

MR. LEARMONTH: I'd first like to enter the following new Exhibits: P-00945 through P-00953, P-01023 through P-01033 and P-01136 through P-01138.

THE COMMISSIONER: All right, those will be marked as numbered.

MR. LEARMONTH: Okay.

Could – the witness today is Paul Humphries. Could Mr. Humphries be sworn?

THE COMMISSIONER: Okay. Sir, if you could stand, please?

CLERK: Do you swear that the evidence you shall give to this Inquiry shall be the truth, the whole and nothing but the truth –

MR. HUMPHRIES: I do.

CLERK: – so help you God?

MR. HUMPHRIES: I do.

CLERK: Please state your name for the record.

MR. HUMPHRIES: Paul Weston Humphries.

CLERK: Thank you.

THE COMMISSIONER: Sir, you can be seated there.

Mr. Learmonth.

MR. LEARMONTH: Mr. Humphries, you're a resident of St. John's, are you?

MR. HUMPHRIES: Mount Pearl.

MR. LEARMONTH: Mount Pearl, all right.

Could you provide us with some information on your education after you completed high school?

MR. HUMPHRIES: Okay. I graduated with a Bachelor of Electrical Engineering from Memorial in 1982.

MR. LEARMONTH: And after you graduated, what work did you undertake?

MR. HUMPHRIES: I went to work with Newfoundland and Labrador Hydro after graduation. I spent, I think, about 18 months on a graduate development program where I had rotations through the distribution area, the transmission design area and the generation planning.

And in late 1983, I accepted the position as transmission-planning engineer with the System Planning Department at Newfoundland Hydro. I was a transmission-planning engineer from '83 'til, I think, it was '89. In '89 I became the senior transmission-planning engineer. And I held that position from 1989 'til 2005.

In 2005, I was appointed manager of System Planning and I held that position until 2013, at which time I was appointed vice-president of System Operations and Planning.

And I retired on August 31, 2016.

MR. LEARMONTH: So your entire career has been spent in system –

MR. HUMPHRIES: System –

MR. LEARMONTH: – planning –

MR. HUMPHRIES: System –

MR. LEARMONTH: – and transmission?

MR. HUMPHRIES: Yeah, I had 22 years as a transmission planner, so the majority of my background was in transmission planning, yes.

MR. LEARMONTH: All right. So in 2012 the position you had was manager?

MR. HUMPHRIES: Manager of System Planning, yes.

MR. LEARMONTH: Okay. And – so the questions I have for you today relate to the period up to December 2012 when the project was sanctioned.

MR. HUMPHRIES: Okay.

MR. LEARMONTH: So anyway, you occupied that position before – at the time of sanction that was your position as manager, is that right?

MR. HUMPHRIES: Manager of System Planning, yes.

MR. LEARMONTH: Yeah. And did – is it correct that Paul Stratton and Robert Moulton reported to you?

MR. HUMPHRIES: Yes, they did.

MR. LEARMONTH: Yeah. And what positions did they occupy?

MR. HUMPHRIES: At that time, Paul Stratton was the senior market analyst and Bob Moulton was the senior generation and rural planning engineer.

MR. LEARMONTH: All right. And what involvement did you have in developing the Isolated Island scenario and the Interconnected Island scenario for DG2 and DG3?

MR. HUMPHRIES: The Isolated Island scenario, we would've had – I would've – my staff would've developed the plan, and I would've overseen the work they were doing. And the planning for the Isolated system was an ongoing event that we were – we had been for

40 years operating in an isolated environment and potentially would continue to operate into the future. So the planning – the primary planning role at that time was the Isolated system. And up 'til today it still is.

MR. LEARMONTH: So the planning part of – for the Isolated Island system was an ongoing process that you did every year or ...?

MR. HUMPHRIES: Yes, every year, yeah.

MR. LEARMONTH: Yeah. So the selection that was made for the Isolated Island scenario, were you involved in making that selection? Because there's certain components to it. Who chose those components?

MR. HUMPHRIES: Well, the components and the ultimate expansion plan that was generated at both DG2 and DG3 would've been – there were – would've been a portfolio of options developed that had been in existence for some time and updated regularly. And these would be the pool of resources that would've been used to determine the ultimate – or optimum, not ultimate – optimum expansion plan for the Isolated system.

MR. LEARMONTH: So there were people that were working on it that reported to you and then you signed off on it –

MR. HUMPHRIES: Yes, that's correct.

MR. LEARMONTH: – when it was finalized? And what about the Interconnected Island scenario? Was that –?

MR. HUMPHRIES: Well, the Interconnected Island – well, obviously it – the piece involving the development of the Lower Churchill and the Muskrat Falls and the Labrador-Island Link, that was pretty well a given to us. But we were involved in the technical evaluation of that facility, the integration of it into the power system; identification of potential issues that would need to be done – or would arise and how they would be mitigated, and you know, looked at the whole integration of at interconnection into the existing Island system.

MR. LEARMONTH: Yes, and what participation did you have in compiling the

cumulative present worth analysis for both DG2 and DG3?

MR. HUMPHRIES: I didn't have any direct involvement. My staff prepared it and I oversaw their work.

MR. LEARMONTH: Okay, so you didn't have any direct involvement?

MR. HUMPHRIES: In the CPW – preparation of the CPW?

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: No.

MR. LEARMONTH: Okay. That's the Strategist –

MR. HUMPHRIES: The Strategist, yes.

MR. LEARMONTH: – Ventyx. And who would've prepared that?

MR. HUMPHRIES: Mr. Moulton.

MR. LEARMONTH: Just Mr. Moulton? Not My Stratton?

MR. HUMPHRIES: Well, Mr. Stratton would've provided an input to that – the forecast input, but Mr. Moulton would've actually taken all the data and input it into the Strategist program and completed the analysis.

MR. LEARMONTH: Okay. And whose decision was it to use a 50-year plus period, as opposed to a more conventional 20-year period for forecasting?

MR. HUMPHRIES: Well – and that decision dates back pre-me in System Planning. We'd probably be looking at the Interconnection from Labrador – I know we were looking at it in the '90s, and it was evaluated then against a continued Isolated scenario, and the 50 years was used then.

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: And it's my understanding that at the time that the supposed experts in the evaluation process, the people who created the

software that we used for evaluation, would've been consulted, and it was determined that the 50-year analysis was the best and fairest way to evaluate that type of an option.

MR. LEARMONTH: And that's for system planning, but what about load forecasting?

MR. HUMPHRIES: Well –

MR. LEARMONTH: Is it true that, conventionally, the convention is that utilities use a maximum of 20-year period for load forecasting?

MR. HUMPHRIES: Traditionally, yes. But if you're gonna do a 50-year evaluation, you have to have a 50-year load forecast as well, and that was consistent back when we did the analysis in the 1990s –

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: – there was a 50-year load forecast used at those times as well.

MR. LEARMONTH: Is this is first time that you used a 50-year load forecast?

MR. HUMPHRIES: Not this – no, it would've been done in the '90s as well.

MR. LEARMONTH: I'm not talking about for the system planning; I'm talking about the load forecast.

MR. HUMPHRIES: We used a 50-year load forecast in this analysis for the Lower Churchill at DG2 and DG3, but in previous iterations of the Lower Churchill analysis back through the Hydro-Québec days and all that, there would've been 50-year analysis done as well of the –

MR. LEARMONTH: For load forecasting?

MR. HUMPHRIES: For load – yes, you had to have a 50-year load forecasting.

MR. LEARMONTH: So this wasn't the first time that you did it?

MR. HUMPHRIES: No.

MR. LEARMONTH: No.

Now, for DG2 and DG3, was conservation demand management applied in your planning?

MR. HUMPHRIES: No, it wasn't directly applied in the planning.

MR. LEARMONTH: Okay. Why not?

MR. HUMPHRIES: Well, the main reason is that when you're looking at – particularly in the Isolated case, the expansion plan that you're putting forward in the Isolated case, you had to have a high-level of confidence so that you could achieve that and you were gonna get the results you needed. Because it's an Isolated system you don't have the luxury of knocking on your neighbour's door when you get in trouble and those types of things, so you had to be fairly confident about what's in the plan –

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: – you could achieve.

MR. LEARMONTH: Okay.

MR. HUMPHRIES: And when you look at CDM, while there was lots of information out there on potential, there was very little information there to give you the level of comfort that you were going to be able to achieve these results based on where we were, even up to 2012, with conservation and demand management.

MR. LEARMONTH: Yeah, but do you agree that CDM management – conservation demand management is used as a planning tool by virtually every utility in North America?

MR. HUMPHRIES: It is.

MR. LEARMONTH: So why wasn't it used in this situation?

MR. HUMPHRIES: Well, virtually every utility in North America didn't have the same problems we have of the fact of the isolation and the fact that you had to ensure – you had nobody to back you up.

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: And that if you made wrong decisions that the lead time for new generations, at times was two, three, four years. It's –

MR. LEARMONTH: But I don't – please explain why that would be a justification for not using the CDM as a –

MR. HUMPHRIES: Yeah.

MR. LEARMONTH: – tool in planning load – for load forecasting?

MR. HUMPHRIES: Because you had to – it reduced the confidence you would have in your forecast and your ability to be able to supply.

MR. LEARMONTH: Yeah. But do you –

MR. HUMPHRIES: Because of the uncertainty, you know, of being able to achieve the results.

MR. LEARMONTH: Why the uncertainty of achieving the results? Why?

MR. HUMPHRIES: We have no histories to show that this will work for us. It works in other jurisdictions. We've had just probably been five or six years at start of the program. The uptake by customers wasn't the greatest. We did not have the level of confidence that was needed to ensure that this was going to deliver for us.

MR. LEARMONTH: But, you know, you have to start somewhere. If you didn't have the level of – I mean, if it's used by virtually all utilities in North America, which I think you've acknowledged – I mean, they had to start somewhere so I don't understand the reason why –

MR. HUMPHRIES: Yes, they had to start somewhere. And we had to start somewhere. We had initiated programs – and they're ongoing today. I don't know – I've been retired for two years now, I don't know how successful they are. But we were in the infancy stage of the CDM programs. But to have the level of confidence to hang your hat on that and say that in 2020 – for argument's sake – that I'm going to have this level of load reduction – I didn't

have that level of comfort or – and we didn't have that level of comfort in 2012.

MR. LEARMONTH: Okay. But do you agree that integrating any reasonable amount of CDM reduces the load forecast and also reduces the needs for generation planning?

MR. HUMPHRIES: It can, if it's successful, yes.

MR. LEARMONTH: Yeah.

Now, I – a witness that testified earlier, a Mr. Philip Raphals, are you familiar with him?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: I'm gonna quote something he said at page 54 of his transcript that he – of his evidence here. He says –

THE COMMISSIONER: Can you just speak up just a bit, Mr. Learmonth? I'm having trouble hearing you.

MR. LEARMONTH: Okay. I was referring to something that Philip Raphals said when he testified here back in October. And I want to put this to you and see whether you have any comment on it.

He said: "NLH has chosen to exclude consideration of CDM savings as a resource in its 50-year power plan. I'm not aware of any other utility in North America that has so blatantly disregarded CDM as a resource."

So he's saying that you blatantly disregarded it. Do you have any comment on that, in addition to what you've said earlier?

MR. HUMPHRIES: No, other than I think on the Isolated Island – the Isolated system in Newfoundland, the situation is different than in the rest of North America. The Interconnected North American grid is a very strong grid and – with lots of interconnections, lots of reserves. If customers do not – or if utilities on the interconnected system do not achieve the full potential they expect, it's not the end of the world. In our Isolated case, if we were counting on that load reduction to serve the load, it could

effectively be the end of the world, from a utility perspective.

MR. LEARMONTH: Sorry, say that again?

MR. HUMPHRIES: It could be the end of the world. If we relied on that CDM for generation – or as an alternative to generation, and for whatever reason it didn't materialize, in all likelihood at some point the lights would go out because we would not have enough generation to serve the load.

MR. LEARMONTH: But –

MR. HUMPHRIES: I don't think that exists anywhere else in North America.

MR. LEARMONTH: Yeah. But you could – okay, assuming what you said is correct, you could still apply it to a – maybe to a lesser degree than what's recommended by, say, Marbek, but you could apply it to a certain degree, could you not?

MR. HUMPHRIES: We – I think Newfoundland Hydro is applying it now, but – and I don't know, as I said, how the success with the programs has progressed in the past couple of years. But back in 2012, there was not enough data available on the success of the programs that would convince me or lead me to want to take the chance on ...

MR. LEARMONTH: Yeah, but I want to refer you to Exhibit 00246 which is tab 2, which is the Marbek Resource Consultants Ltd. report of January 31, 2008?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Yeah.

Now, if we turn to page 5, I'm just going to read from paragraph 2 in the introduction. It says: "This study will also be a significant component in the further implementation of the Province's recently released Energy Plan. The Energy Plan establishes a long-term vision for how the province's energy resources will be developed and utilized to benefit the people of the province today as well ... for future generations. Electricity conservation and demand management ... are an important component of

the provincial Energy Plan as are the conservation and demand management components for the other energy resources of the province.”

And then it goes on to say: “This report meets, in part, the requirements of the Public Utilities Board Order PU 8 2007 requiring NLH to file this study and a five-year plan for implementation of CDM programs in 2008.” So it appears that this issue was before the Public Utilities Board in 2007 and this report was filed in order to comply with the report.

Now, I heard what your evidence is, but I mean this report was dated January 31, 2008. So would it be fair to say that you disregarded the recommendations of the Marbek report?

MR. HUMPHRIES: No, I –

MR. LEARMONTH: Exhibit 00246?

MR. HUMPHRIES: No, I don’t think we disregarded it and that – through that whole period from 2008 up to 2012, there was work being done to advance CDM initiatives in the province.

But all I’m saying that at 2012 there was not sufficient data available to ensure – to make us confident enough to include that in a generation expansion plan.

MR. LEARMONTH: Okay, well let’s turn to page 13 of Exhibit 00246. Could you read out the first two paragraphs on that page, Sir?

MR. HUMPHRIES: Page –?

MR. LEARMONTH: Thirteen – numbered in the top right-hand corner.

MR. HUMPHRIES: Okay. Oh, sorry, I’m looking at the (inaudible).

MR. LEARMONTH: Yeah. Okay.

MR. HUMPHRIES: “The study findings confirm the existence of significant potential cost-effective opportunities for CDM in Newfoundland and Labrador’s Residential, Commercial and Industrial sectors

“Exhibits 2.1 and 2.2 summarize the total combined electricity savings for the Residential, Commercial and Industrial sectors that have been identified in each of the individual sector reports for, respectively, the Island and Isolated” – Island Isolated – “and the Labrador Interconnected service regions.”

MR. LEARMONTH: Yeah.

So, I mean, as of the date of this report, December 31, 2008, Marbek is saying that their findings confirm the existence of significant potential cost-effective opportunities for CDM, and that’s both in residential, commercial and also industrial sectors. So, with that finding, can you explain why you didn’t immediately address this issue in a more complete manner than you’ve indicated?

MR. HUMPHRIES: Well, from the perspective of going out and implementing the programs to ensure that you achieve this saving through the CDM initiative; I was not responsible for that. There was a move – an area within the organization that was responsible and was moving that effort forward.

But from the perspective of me looking at that and assessing it as a viable alternative that would reduce the load, where we were sitting in 2012 I did not have the confidence that that was going to cut it. And that – I had a real concern that if that did not materialize, we would be left short.

MR. LEARMONTH: Yeah.

So you didn’t agree with the recommendations of the Marbek report?

MR. HUMPHRIES: No, I agreed that the potential was there, but the potential being there and actually being able to access and get it are two different things. We were in the process of testing it, testing the market, putting in programs to try to achieve it and we had not gotten a whole lot of traction up to that point.

MR. LEARMONTH: Yeah.

But I suggest to you that if you agreed with the report, you would have implemented the recommendations –

MR. HUMPHRIES: No.

MR. LEARMONTH: – of the report?

MR. HUMPHRIES: Well, you know, we did – there was a sensitivity done against CDM back at DG2 where we looked at – assuming that we could achieve certain targets, and I think they aligned with what was in here – what would it mean to the different – what would the difference be between the Isolated Island and the Interconnected. And in both those alternatives it – while it reduced the CPW preference for the interconnection, it didn't eliminate it.

MR. LEARMONTH: Yeah.

But I don't want to – you know, I've asked you a few questions on this, but I just want to point out at the bottom of page 35 of Exhibit 00246 there's a reference to the CAMPUT studies. It says: "The CAMPUT study" – this is the second-last paragraph – "which included a review of U.S. and Canadian jurisdictions, concluded that an annual CDM expenditure equal to about 1.5% of annual electricity revenues might be appropriate for a utility (or jurisdiction) that is in the early stages of CDM programming. This level of funding recognizes that it takes time to properly introduce programs into the market"

So what level of funding did NLH spend after receiving this Marbek report, 1.5 per cent?

MR. HUMPHRIES: I'm not sure.

MR. LEARMONTH: Yeah, but you're responsible – this is in your – under your control, is it? I know that other people were involved in the load forecasting, but they reported to you. Is that correct?

MR. HUMPHRIES: Well, yeah, but – and even Mr. Stratton wasn't responsible for initiating these programs and getting them off the ground. There was other areas of the organization was doing that work.

MR. LEARMONTH: Yeah.

And then this – the last paragraph that I'm going to refer to, the last paragraph on page 35 says: "The same study found that once program

delivery experience is gained, a ramping up to a level of about 3% of annual electricity revenues is appropriate" et cetera.

So, once again, if you weren't following it I guess you wouldn't have ever ramped up to 3 per cent. Is that correct?

MR. HUMPHRIES: That's right. It wasn't – that wasn't in my – there were other people running the program and making assessments on how successful it was and, I guess, when it would be ramped up.

MR. LEARMONTH: Okay and who would those people be?

MR. HUMPHRIES: I struggle for that and I don't remember who the people – I think at one stage it was through customer service and then I think I recall there was a separate group, an energy efficiency group that the responsibility fell with under them.

MR. LEARMONTH: But this is a component of your load forecasting, is it not? I mean CDM, as a – if it's applied, would have a bearing on your –

MR. HUMPHRIES: If it's applied and works, yes, it is a function of –

MR. LEARMONTH: So –

MR. HUMPHRIES: – an input to our load forecast.

MR. LEARMONTH: So wouldn't the people who were reporting to you who did work on the load forecasting be interested in this (inaudible).

MR. HUMPHRIES: Yes, they were. Mr. Stratton would have been involved in all discussions that would have been going on. If there were working groups involved, he would have been a part of that.

MR. LEARMONTH: Okay, but not you.

MR. HUMPHRIES: Not me.

MR. LEARMONTH: No.

Did Nalcor conduct any sensitivity tests on loads for either the DG2 or the DG3 process?

MR. HUMPHRIES: Sensitivities were done at DG2.

MR. LEARMONTH: They were?

MR. HUMPHRIES: At DG2, yes, they were done.

MR. LEARMONTH: I don't believe we've been able to find the results for that.

MS. O'BRIEN: DG2.

MR. LEARMONTH: Okay, DG2. Okay, yeah.

MR. HUMPHRIES: Yeah.

MR. LEARMONTH: What about DG3?

MR. HUMPHRIES: Apparently they were not done at DG3.

MR. LEARMONTH: Do you know why?

MR. HUMPHRIES: No, I do not. I really don't know why they were not done.

MR. LEARMONTH: But that was your responsibility to do them, right?

MR. HUMPHRIES: No, we would – at that stage we were completing the analysis and we would have been asked to do it, if it were required. At – even what the work that – the analysis that was done at DG2, System Planning actually did not complete that work. That work was done – and I'll just back, back a little bit.

And part of the reason was to do these, yeah, sensitivities through Strategist is a very complex and time-consuming process. And back in 2010, I guess, at DG2 when the whole issue of sensitivities came up and what we're – how – what was going to be done and how they were going to be handled, it became obvious that this was going to be a huge effort for the one individual that had the capability of doing it and running the Strategist program.

So they – through – and I'm not positive at that time it was PricewaterhouseCoopers or

Navigant, but it was one of the consultants that was involved. There was a process developed, a spreadsheet developed outside of Strategist that could basically do these calculations and estimate the impact on CPW of the sensitivity changes.

That spreadsheet was developed and the sensitivities were actually done by someone in Investment Evaluation. They were not done by System Planning, they were not – they were – the model that they did was calibrated against Strategist runs, but the actual calculation of the CPW differences was done outside of Strategist through this analysis developed by – and I'm not sure if it was Navigant or PricewaterhouseCoopers, one.

MR. LEARMONTH: But – now, I'm suggesting that was under your – that was your responsibility to do these things.

MR. HUMPHRIES: At that stage, the way the project was – the actual decisions on what sensitivities would be run, I did not have the final say on that. There would – there was discussions we would have been involved in discussions, but the sensitivities that were actually ultimately run and reported in the various reports were decided by people within the project team.

MR. LEARMONTH: Who was that?

MR. HUMPHRIES: I really don't know who in the project team. It would've been – we would've been asked through – from someone in the project team – a senior group within the project team. And I do recall back at DG2, when the sensitivities were done, having discussions with Navigant. And they made suggestions upon what sensitivities –

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: – to look at. And, also, as part of the PUB review, Manitoba Hydro also suggested others, which were done, and that they would've been included in the DG2 analysis. But –

MR. LEARMONTH: Yeah, but I'm not talking about DG2.

MR. HUMPHRIES: No, I have no recollection. And I've checked with the people that work with me. They have no recollection of being asked to do anything with load sensitivities, or any sensitivities for that matter, at DG3. The sensitivities that were done at DG3 would've been done outside the planning process, through this financial model.

MR. LEARMONTH: If they were done at all.

MR. HUMPHRIES: Well, there were some done. They were in the reports, so I assume they were done.

MR. LEARMONTH: But I just want you to look at Exhibit 00121.

MR. HUMPHRIES: (Inaudible) tab.

MR. LEARMONTH: Tab – it's not in a tab, it's just Exhibit 00121.

MR. HUMPHRIES: Okay.

MR. LEARMONTH: First, go to page 1.

Okay, just – you can turn that up a little bit. So this is the – as you can see, this is: *Nalcor Energy – Lower Churchill Project Phase 1; Decision Gate 3 Support Package*, November 2012. Correct?

MR. HUMPHRIES: Yes, that's right.

MR. LEARMONTH: So, if we just turn up to page 189, if you look at the third item – well, the heading is: Gatekeeper requirements for DG3, House of Assembly requirements as listed above plus, and 3: "Additional sensitivities – Loss of Island Industrial, ML, additional Labrador Load."

Leader: P. Humphries. That's you, right?

MR. HUMPHRIES: Yes, it is.

MR. LEARMONTH: And it says: Completion date: October. And then comments: Primary focus is on the "ML sensitivity. Awaiting numbers from Ventex; due next week."

So I – you know, reading that on its face, it suggests that when this report was prepared, that

the request had been made for these sensitivities and you were waiting on them.

MR. HUMPHRIES: I recall –

MR. LEARMONTH: Do you agree with that?

MR. HUMPHRIES: Yes. Well, I –

MR. LEARMONTH: With my interpretation of what it says here?

MR. HUMPHRIES: Your interpretation of – I'll give you my interpretation of what's there.

MR. LEARMONTH: Okay, please do. Yeah.

MR. HUMPHRIES: These three items that were listed here, I remember doing work on those. And they were items that I think, as I recall, they were being done sort of like a back pocket – for back-pocket information. The –

MR. LEARMONTH: What do you mean by back-pocket information?

MR. HUMPHRIES: That there are things that could have an impact on CPW if they occurred. They might necessarily occur, but there were potential impacts for these three items that could have an effect on CPW.

MR. LEARMONTH: Right.

MR. HUMPHRIES: And we did an analysis on these three items or provided commentary on these three items on what the impacts would be. And as I recall the loss of the industrial load was not a sensitivity as such on the loss of the industrial load, it was a sensitivity or a quantification at the time.

When we did the sensitivity on loss of an industrial loader at DG2 it involved the loss of a generic 880 gigawatt hours of load. It was meant to represent Corner Brook Pulp and Paper closure. No, we didn't feel comfortable talking about that at the time as identifying it as a – that as a loss and there was a generic CPW – or CPW or a sensitivity done to determine the impact.

MR. LEARMONTH: Yeah, but I'm – I want you to focus –

MR. HUMPHRIES: Yeah, just can I continue?

MR. LEARMONTH: Oh, sorry. Go ahead.

MR. HUMPHRIES: And this piece of work, as I recall, was to quantify the differences between the loss of that generic load and the true loss of it, Corner Brook Pulp and Paper, because there are differences. The sensitivity that was done for the generic loss just looked at taking 880 gigawatt hours load off the system. The Corner Brook Pulp and Paper system is more than a little bit, it's quite different.

Corner Brook Pulp and Paper self-generates most of its requirement. They have 130 megawatts of hydroelectric generation. If you looked at assuming that the load came off and the generation stayed, yes, you're effectively putting out 880 gigawatt hours. If the generation didn't stay, the generation disappeared, it's probably – it's not much of an impact at all.

And the assumption at that time was, I think, that this generation – if Corner Brook were to close the generation would come back to the province. And the generation at Corner Brook and Deer Lake right now, it's – while it's 130 megawatts of it, 80 megawatts of it is 60 hertz, which would be useful to the system today. The other 50 megawatts is 50 hertz, because the load at the mill is 50 hertz or a portion of it. So to make that generation useful to the system, money would have to be spent to convert that to 60 hertz to get full capability.

So this analysis, that's what we did at that time, was to make – to clarify and quantify the differences between the loss of – the generic loss of 888 gigawatt hours and a loss as opposed to the definite loss of Corner Brook.

MR. LEARMONTH: Are you finished?

MR. HUMPHRIES: I think so.

MR. LEARMONTH: Okay, now, just getting back to the comments.

MR. HUMPHRIES: Yeah.

MR. LEARMONTH: The comments say: "Primary focus is on ML sensitivity. Awaiting

numbers from Ventex; due next week." And you're the leader of this initiative.

Now, my question is this: You agree with me when you say: "Awaiting numbers from Ventex" that that means that numbers have been requested of Ventyx?

MR. HUMPHRIES: The numbers were related to the Maritime Link piece.

MR. LEARMONTH: Yeah and then "due next week." Now, did you get any of these things back from Ventyx?

MR. HUMPHRIES: What we were doing at that stage –

MR. LEARMONTH: If you could just answer yes or no. Did you get anything back?

MR. HUMPHRIES: As far as I know, it's still ongoing.

MR. LEARMONTH: Oh, so you haven't got anything back?

MR. HUMPHRIES: We got – we had some information back. We didn't have numbers.

MR. LEARMONTH: Oh, but this says awaiting numbers from Ventyx.

MR. HUMPHRIES: Yeah, so that –

MR. LEARMONTH: So those numbers still haven't come?

MR. HUMPHRIES: Can I explain –

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: – what we were doing?

At the time, when we looked at the Maritime Link, there was very little benefit given to Maritime Link in the analysis. The reality is that the Maritime Link is a second connection to the North American grid and it has the ability to send power both ways: from the Island to Nova Scotia and from Nova Scotia back. There was potential that, if we looked at the – looking at the Interconnected expansion plan as it existed, you will see that once you got out into, say, the

early 2030s, you started to have to add combustion turbines.

If, through reserve sharing agreements and possible further commercial agreements with the Maritime utilities, there was a possibility that you could possibly defer some of those expenditures by putting arrangements in place with the Maritimes to get those – that capacity, this whole analysis Ventyx was setting up – we’d gone to Ventyx. We had no experience in modelling those types of things. Ventyx was trying to get – to model the work for us to get some preliminary numbers.

If that worked, then you – we also started in discussions with the Maritime utilities on the prospects of reserve sharing agreements, the possibility of what excess generation might be there that we would be able to assess – access if we needed. And the whole thought was then to do a further analysis and see if this could further enhance the Interconnected case.

MR. LEARMONTH: Okay, well, I’m just gonna go back to page 189, and I’m gonna read, for the third time, the comments: “Primary focus is on ML sensitivity. Awaiting numbers from Ventyx; due next week.”

Did you ever receive the numbers from Ventyx?

MR. HUMPHRIES: As I –

MR. LEARMONTH: Yes or no?

MR. HUMPHRIES: No.

MR. LEARMONTH: Okay.

MR. HUMPHRIES: There were no numbers.

MR. LEARMONTH: And this was a House of Assembly requirement, was it not?

MR. HUMPHRIES: Now, it was a – as I – it was a requirement of the Gatekeeper.

MR. LEARMONTH: It’s a Gatekeeper requirement for DG3. “House of Assembly requirements as listed above plus.” Yeah. Okay. So you didn’t get it.

And is – are you still expecting to get it? I mean –

MR. HUMPHRIES: I don’t know. I’ve been retired for two years. I don’t know – (inaudible).

MR. LEARMONTH: Okay.

Now, integrated resource planning, are you familiar with that term?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Up until – we’ll say the time of sanction – December 2012, was integrated resource planning a tool that was used by Nalcor in developing load forecasts or for any other purpose?

MR. HUMPHRIES: No, I mean, the planning process we went through would have been – and the methodologies used – that is a – would have been a portion of an integrated resource plan. But no, we hadn’t done full integrated resource planning – excuse me.

There had been discussions around the implementation of it with the Public Utilities Board, and we were looking towards that and looking at the implications of getting into that type of process, the resources that would be required and the – I guess an assessment of the pros and cons and benefits of an IRP as opposed to what we were currently doing.

MR. LEARMONTH: But I suggest to you the IRP is a very standard, universally used tool –

MR. HUMPHRIES: It is.

MR. LEARMONTH: But so why doesn’t Nalcor use it?

MR. HUMPHRIES: Well –

MR. LEARMONTH: Or why didn’t Nalcor –

MR. HUMPHRIES: Well –

MR. LEARMONTH: – use –

MR. HUMPHRIES: I think, you know, this was – it was bigger than Nalcor. This was a public – or a Public Utilities Board driver in this,

because they would have to be a participant as well, as long – as well as the other stakeholders in the system. So it's not – I think the advancement of the IRP would be more than just a Newfoundland Hydro; it would be an industry effort moving forward.

MR. LEARMONTH: Yeah, but in 2004, the PUB said that the IRP was a useful process to pursue. Do you agree with that?

MR. HUMPHRIES: And I agree, yeah.

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: It probably was a useful process.

MR. LEARMONTH: Okay. And then in 2007, once again, the PUB said that – well, Newfoundland and Labrador Hydro should pursue it, but they didn't make an order to pursue it. So did you not follow this advice to pursue it?

MR. HUMPHRIES: No, well – you know, I seem to recall through 2006-2007, we were making – moving in those directions to do some of the things. I think we talked about that prior to our next generation source that if – our next generation decision, we would actually probably go with an RFP to test the market to see if – what other alternatives were out there besides our own, which would've been a step in an IRP.

But all of those things seemed to go cold after the Energy Plan and ...

MR. LEARMONTH: Okay.

Well, the point is that if it's used universally by other utilities in North America, I just would like to know if you have any information as to why Nalcor or Newfoundland and Labrador Hydro wouldn't use it as a tool?

MR. HUMPHRIES: Well, I don't know other than that we are – Newfoundland and Labrador Hydro was still in an evolutionary process. I mean, compared to other utilities in the country, we were relatively young. We were – we'd grown a lot, grown fast in a relatively short period and, you know, we were learning in leaps and bounds as we were going.

It – yes, it is a process that was in place in other utilities. I know, from the perspective of my own, the System Planning perspective, that if we had to be involved in an IRP process, it would mean a considerable increase in workload on the staff and you would need additional resources to do it.

So I – but, yes, it – no argument. It was the in vogue thing to do.

MR. LEARMONTH: Yeah, and as I said, it goes back to, like, it was – it's an old – it goes back before 2004 as a concept or as something that utilities do. But in 2004, the Public Utilities Board did recommend that you have a look at it. So it just seems to – that nothing was done.

MR. HUMPHRIES: Yeah, I – you know, I – back in 2004, I'm not – I wouldn't have been as close to it in 2004 as I would've been in late 2005 and beyond, but, yes, I know there was discussions back and forth and there – internally and with the Public Utilities Board there were discussions on, you know, how this could be moved forward and the benefits of it. But as I said, after 2007, things seemed to go cold on the whole process.

MR. LEARMONTH: Okay. Thank you.

The – and up to the time you left, it still wasn't being applied?

MR. HUMPHRIES: No, it wasn't.

MR. LEARMONTH: And you left in 2016, right?

MR. HUMPHRIES: 2016, yes.

MR. LEARMONTH: All right.

One other Exhibit I just want to have a quick look at is 00926, P-00926. It's not in the book.

MR. HUMPHRIES: Okay.

MR. LEARMONTH: But it will come up on your screen, Mr. Humphries.

MR. HUMPHRIES: Yep.

MR. LEARMONTH: Yeah.

Yeah, this is a DG3 Alignment Session, August 3, 2012. And if we go to page 15, so:

“Why has the CPW changed?”

“Nalcor has already integrated 54MW of wind and committed to an additional 25MW in 2014-2015;

“Nalcor’s 2010 PUB submission identified the possibility of 200MW additional wind to Isolated system, requiring detailed further study;

“Further analysis confirmed integration of 200MW of wind is possible but can occur earlier than anticipated at DG2;

“This has a material impact on CPW preference.”

Can you explain to me why those facts would have a material impact on the CPW preference?

MR. HUMPHRIES: I’m not sure in the context in which that’s being put forward. There was – between DG2 and DG3, there was, yes, an increase in the amount of wind. In theory, the wind would actually have the effect of reducing the cost of the Isolated case because you’re displacing more expensive fuel with wind generation. So that’s going in the opposite direction of what this document is saying.

So I’m struggling at the moment with –

MR. LEARMONTH: So that is going in the opposite direction, isn’t it, what you just said?

MR. HUMPHRIES: It says, “... has a material impact on CPW preference.”

MR. LEARMONTH: Yeah, it doesn’t say which way, though.

MR. HUMPHRIES: Okay, so –

MR. LEARMONTH: Well, I don’t think it does. That’s –

MR. HUMPHRIES: Yeah, but, I mean – well, I’m just thinking – bringing myself back to –

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: – the differences at DG3 and DG2, they were similar.

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: The overall.

MR. LEARMONTH: But this would – is it your understanding – are you able to say that this would tilt in favour of the Isolated Island?

MR. HUMPHRIES: Yes, it would.

MR. LEARMONTH: It would, these facts.

MR. HUMPHRIES: Yeah.

MR. LEARMONTH: Yeah. Okay. But you don’t now how much.

MR. HUMPHRIES: No, not off the –

MR. LEARMONTH: Okay, thank you.

MR. HUMPHRIES: – top of my head.

MR. LEARMONTH: Now, Exhibit – we’re going to get into the – you know, a more focussed examination of the components or elements of the Isolated Island that you reviewed and as a – in part of the screening process, but I first want to go to Exhibit P-00058, first page 16.

MR. HUMPHRIES: Yeah, that’s not in my book.

THE COMMISSIONER: (Inaudible.)

MR. LEARMONTH: No, no, I think I showed it to you yesterday.

MR. HUMPHRIES: Okay, yeah.

MR. LEARMONTH: Or – yes, I did.

Page 16. Just go down – yeah.

So this is the – this is a diagram of the Interconnected Option, and that was – is that familiar to you for the Interconnected?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Okay, and then if we go to page 17. That's the Isolated Island Option.

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Now, is that – is the Isolated Island Option as detailed on page 17, the Isolated Option scenario that you addressed in your work?

MR. HUMPHRIES: It's close. You know, after our meeting yesterday, I went back and did some comparisons. And even, I think, after this report was generated, there was – it looks – it appears to me that there was some further refinements and actually a little bit additional wind, probably 75 or 100 megawatts of extra wind, was added again.

MR. LEARMONTH: After –

MR. HUMPHRIES: After this report, yeah. And that – I think that would've been after the finalization of our own internal studies and the Hatch studies, that the numbers for the wind that ended up in the final DG3 analysis were the numbers that were recommended in that report, which was to bring it up to 300 megawatts.

MR. LEARMONTH: Yes, and were the screening of options done prior to DG2? That would be in November 2010.

MR. HUMPHRIES: Yes.

MR. LEARMONTH: All of them were, yes.

MR. HUMPHRIES: Yes. You know, there was obviously some refinement on wind after DG2, but the –

MR. LEARMONTH: Yes.

MR. HUMPHRIES: – screenings would've been done before it.

MR. LEARMONTH: (Inaudible.) Thank you.

Now, I know you're – I'd like you to address a subject that I know we discussed in the interview, and that's the stability of the Isolated Island system compared to a North American integrated system. And we'll talk later about how your understanding about – on the stability

issue has an impact on the capacity of the system to take on more wind or non-dispatchable hydro power.

But on that subject, generally, can you give an explanation of your understanding of the weaknesses or strengths of the Isolated Island system compared to the Interconnected system?

MR. HUMPHRIES: Yeah, well, you know, it's – the Isolated Island system today is a system of less than 2,000 megawatts. It's dispersed over quite a significant geography. It – again, it's because no connection to the North American grid, so the issues of voltage control and frequency control, you're totally reliant on the resources, the generators in the system to provide the regulation of the system.

And by nature of the fact of the distribution of the various generation around the Island, it – while it's – it is possible to regulate the system energy – we've done a reasonable job in doing that over the past 60 years – it doesn't have the robustness that the Interconnected system has and that when you have disturbances on the system, they do have a far – more far-reaching effect than they would on – than the same disturbance would have on an Interconnected system, to the extent that we have something.

We implemented a program here on the Island called under frequency load shedding which is pretty well unique to us. And, also, it's taboo in an interconnected environment where, for certain conditions on the system – loss of generation and whatnot – that we actually dump customer load to maintain the integrity of the system to keep it from cascading into a failure. That's something that's not acceptable anywhere else in North America and it's a first line of defence, but it has been our first line of defence and our lifeline for the past 60 years.

So it – with the system as we have it today in Isolated, and I think even Isolated into the future, I don't think it would be possible to achieve the level of reliability where we could withstand a loss of generation and not have to dump load to protect the integrity of the system, because of the relative weakness of the system, the inertia that would be there to pick up the load when – or needs to be there when – to pick up the load when an event happens.

MR. LEARMONTH: So are you suggesting the system is, perhaps, delicate – more delicate than –

MR. HUMPHRIES: It is.

MR. LEARMONTH: – or less ...?

MR. HUMPHRIES: It's more delicate, and relative to the events that are not even noticed on an interconnected system, cause grief on this system, or have the potential to cause grief.

MR. LEARMONTH: Can you give us an example?

MR. HUMPHRIES: Well, the simple loss of 50 – a 50-megawatt generator trips off, that's not noticed anywhere on an interconnected system. And if we were interconnected, it wouldn't be noticed, but we have to – nine times out of 10, we end up actually dropping customer load to survive that event. If we didn't drop the customer load, we'd get into a cascading outage and probably have a blackout.

MR. LEARMONTH: Okay.

And can you explain what – or apply what you just said to the prospect of introducing wind into the system, or non-dispatchable hydroelectric power?

MR. HUMPHRIES: Yeah. Yeah, there's two; the non-dispatchable piece, that's – I'll address that first, I guess. There's concerns with the non-dispatchability –

MR. LEARMONTH: Maybe we should just – so everyone understands, can you just – can you explain the difference between dispatchable and non-dispatchable?

MR. HUMPHRIES: Well, okay. Dispatchable generation is a generation – either it's a fossil-fuel generator that you have the ability to turn it on, turn it off and ramp it up and ramp it down. You're pretty well assured that's it going to be there at peak load because you have the ability to do that. And the same with a hydro plant that has storage; it's the same type of thing. You can pretty well guarantee yourself that that's going to be available over peak.

A run-of-the-river hydro, that only operates when there's water running in the river; there's no storage. If there happens to be no water running at peak, you're not going to get any generation out of that. Wind, very similar; if the wind is not blowing at time of peak, you're not going to get the power.

So those are challenges with – of integrating non-dispatchable generation into a system, particularly an Isolated system like ours. And the more of that that you integrate, it makes it harder to operate the system because you haven't got the dependability on the – the ability to be able to rely on those generations. And lots of times you need other sources to back them up and that adds cost.

The stability piece, it's slightly different. And from my perspective it's more of an issue with wind than with small hydro. And the reason for that is that the generation technology used for wind generators is different than the conventional technologies that would be used for hydro and all the other generators that we have on our system.

It gets a little complicated but I'll to explain it as simply as I can. The Interconnected system and the generators on it – the generators are called synchronous generators. They connect to the system and they're all synchronized together; the units move with the system.

MR. LEARMONTH: They adjust.

MR. HUMPHRIES: They adjust.

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: If something happens, one – you know, they equally move and that helps to keep the system stable.

Wind generators are not – they have what's called an induction generator. It's not synchronized to the system. It has the ability to feed power into the system, but it doesn't move and support the system like a synchronous generator does.

Further compound – to compound the issues that if the operating conditions, frequency or voltage on the system get out of an accepted range,

synchronous generators can actually drop off the system – or not – sorry, not synchronous, induction generators, like we have with the wind.

Wind generation technology does have – wind generators have what they call power electronics attached to them that help to smooth the system voltages and conditions to keep them online. And that works within a range of voltage and frequency, and for most applications – like on a large interconnected system – it's not a problem because the deviations of both voltage and frequency never get out in that range.

On our system, because of its lack of robustness, it can get out there. It has. It doesn't happen often but it can. And when that happens, that might happen as a result of an event – we might have a unit trip at Holyrood, for argument's sake. And if we get into a – outside of that operating range that – to the effect that it starts to – would affect the wind and the wind starts to drop off, now we have a larger problem and you're headed to a cascading-type outage.

Up to a certain level, you can integrate this – these technology, induction technology, and I think operate effectively with it. My concern, and it's always been my concern, is as you add more and more of it, you get to stages where the percentage or the – say, yeah, the percentage or amount of this induction generation that – does not much to support – doesn't do a whole lot to support the system. It's close to the amount of synchronous generation that's out there, and given the weaknesses of the system, I figure that there's gonna be more of these events that they will be sensitive to. We haven't done a complete analysis on it, and I also think it's not possible to identify all the scenarios that you could potentially get into that could cause you problems – that, you know, some of them you would learn the hard way, through outages.

And so from the perspective of wind, the penetrations that we have, and that we've gone to in DG3, they are consistent with what other isolated utilities have used, and that's a 10 per cent penetration on capacity. We've gone to that level. I feel fairly confident – still have some apprehensions that things will work at that level, or you can make them work. There may be needs for curtailments and all that type of thing,

which ultimately cuts into the efficiency of the wind. But I think we can manage.

MR. LEARMONTH: At that level?

MR. HUMPHRIES: At that level.

Beyond that we're in uncharted territory – not – the 300 megawatts is uncharted for us, but I think we can get there. Once we go beyond the 10 per cent we're in uncharted for the industry, and that is not a comfortable place to be for something that you are gonna have to depend on and rely on to provide the power.

MR. LEARMONTH: So as part of – if we're part of – well, we will be a part of an integrated system. We're connected to the mainland and to Labrador, so with that being the case, you're saying that we could introduce a lot of wind power –

MR. HUMPHRIES: Well, not –

MR. LEARMONTH: – and the system –

MR. HUMPHRIES: – all these problems go –

MR. LEARMONTH: – could handle it –?

MR. HUMPHRIES: – all these problems go away.

MR. LEARMONTH: Okay. But without it, they –

MR. HUMPHRIES: They –

MR. LEARMONTH: – (inaudible).

MR. HUMPHRIES: – they're real.

MR. LEARMONTH: So –

MR. HUMPHRIES: They are real.

MR. LEARMONTH: So then I guess it's an irony that in order to get to the situation where we can introduce, sort of, an unlimited amount of wind power, we have to be connected.

MR. HUMPHRIES: Yes, that's true.

MR. LEARMONTH: Yeah, so ...

And when we talk about being interconnected with the North American grid, if we just had a connection with Labrador – in other words, forget about the Maritime Link – just the connection for the Labrador-Island Link, would that constitute being part of the North American grid?

MR. HUMPHRIES: Yeah, yes –

MR. LEARMONTH: Or would we have to have the connection to the Maritimes also?

MR. HUMPHRIES: No, I think just the piece to Quebec would – could do the trick from that perspective. But, you know, the connection to Nova Scotia that completes the Link. With just the connection to Labrador, there are still reliability concerns; you’ve only got the one connection and all those types of things. With the connection to Nova Scotia, we have a solid connection to the North American grid two ways, and –

MR. LEARMONTH: But with the connection to the Labrador – that would constitute us being part of the –

MR. HUMPHRIES: North American grid.

MR. LEARMONTH: – (inaudible) grid –

MR. HUMPHRIES: (Inaudible) –

MR. LEARMONTH: – even without the connection to Nova Scotia?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Okay. All right.

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Okay, thank you.

Now, one – I wanna ask you some questions about your work on the Isolated Island Option, but I want to take you to one option, I think, that’s been floated out by other – many people. And that would be adding additional turbines at both Bay d’Espoir and Cat Arm, and then adding wind. The expectation being that you’d use wind – when the wind was available you could use it, and then store water, more water in the

reservoirs and then the water would be there at peak times when you needed it.

Can you give a – your comments on that situation, or that possibility for Bay – adding an additional turbine at both Bay d’Espoir and Cat Arm –

MR. HUMPHRIES: Yes, I –

MR. LEARMONTH: – together with wind?

MR. HUMPHRIES: – can.

MR. LEARMONTH: Together with wind?

MR. HUMPHRIES: Together with wind?

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: Okay.

So yes, there is the potential to be able to add an additional unit at Bay d’Espoir; I think it’s 150 megawatts and approximately a 60-megawatt unit at Cat Arm. Technically, these systems – there’s no extra energy associated with these systems –

MR. LEARMONTH: Right.

MR. HUMPHRIES: – in their – themselves.

So all they bring to – the value they bring initially is capacity, the extra megawatts to get you over your peak. Not ‘undifferent’ than what a combustion turbine does. And these developments would be considerably more costly than a combustion turbine as well, if you were just treating them for capacity.

From the perspective of wind, again, I’ll hearken back to my previous discussion on the concerns with – my concerns with wind, and I think Hydro’s concerns with wind on the stability issue and the analysis that was done up to – in 2012 by both ourselves and Hatch – particularly the Hatch analysis. That – the Hatch analysis indicated that, from the perspective of it preventing spill and those types of things, that there was no increased – or ultimately significant increased risk of spill for the addition of wind. And I think they went up – probably even up to 400, 425 megawatts. You’d have to

get up beyond that level before there was a risk of additional spill.

And so from the perspective of using either Bay d'Espoir or Cat Arm to further facilitate further wind, you would be in the ranges where you were up beyond 450 megawatts – 425 megawatts, whatever it was, before that would become a real value or benefit.

And as I said before, my issue with wind is on the lower end of the stability piece, and right now we're down at 300 megawatts. And until you can get the level of operating comfort, or whatever it takes, to show that we can – we could operate above 300 megawatts, I see not a whole lot of benefit to the Cat Arm and Bay d'Espoir projects, simply for capacity. If you want – if you need capacity, add combustion turbines. At some point in the future, and even on the Interconnected case at some point in the future, these units will likely get developed and added.

MR. LEARMONTH: Yeah. But wouldn't the proposal that we just discussed, like, you know, adding wind at both those facilities, wouldn't that allow water to be stored while the wind turbines were contributing to the power supply?

MR. HUMPHRIES: Well – and again, I struggle with actually how much water would actually get –

MR. LEARMONTH: Saved.

MR. HUMPHRIES: – stored.

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: Saved.

And that the fact that the – I think part of the argument was that you'd save it and take it out at another time. We can do that now without Bay d'Espoir and Cat Arm, and take it out at other times. It's only at times of peak that we got a problem with 'turbinning,' so it's a combination of having the load to be able to supply – it's more complex than just storing it and taking it out later.

MR. LEARMONTH: Yeah.

So would it be fair to say that you don't think much of that proposal?

MR. HUMPHRIES: It's an idea.

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: It's an idea but, you know, I don't think it's – in the situation that we had, I don't think it brings a whole lot of extra value.

MR. LEARMONTH: Yeah. And it's the reliability, the fact that the –

MR. HUMPHRIES: The biggest thing, as I said – for me, the biggest thing in this reliability piece. All the economic stuff you can work around – it's money. But the reliability piece – the lights go out, and you don't want that.

MR. LEARMONTH: And that's based on the delicacy of the –

MR. HUMPHRIES: System.

MR. LEARMONTH: – Isolated Island.

MR. HUMPHRIES: Isolated system, yes.

MR. LEARMONTH: Yeah, okay.

I guess the only other place in North America that would be isolated would be Hawaii, would it?

MR. HUMPHRIES: Yeah, I think so.

MR. LEARMONTH: That's the only other place? Yeah.

All right, now, I wanna discuss the – you know, the main – well, a main component of the Isolated Island scenario was the Holyrood facility. Do you agree with that?

MR. HUMPHRIES: Yes, very much so.

MR. LEARMONTH: (Inaudible) okay.

And I want to refer you to Exhibit 001136. That's tab 4 of your documents, Sir. And page 20 – page 30. Have you got that?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: You do. Okay.

And I'm just going to quote from the second paragraph: "In the Province's Energy Plan, Hydro was directed to pursue one of two options for dealing with environmental concerns related to the HTGS." – that's Holyrood Thermal Generating Station – "The first option was based on replacing the HTGS with energy from the Muskrat Falls development via" the "HVdc link to the Island. The second option was based on an isolated island system, similar to present day operations, but the HTGS environmental concerns of sulphur dioxide ... and particulate emissions will be addressed via the addition of scrubbers and electrostatic precipitators. The scrubbers and electrostatic precipitators will not address greenhouse gas issues. These two options have been named for the purposes of this report as the Interconnected ... scenario and the Isolated Island"

So you agree that the choice to include Holyrood in the Isolated Island was something that – it wasn't something that was developed by Strategist; it was something that was dictated by provincial policy?

MR. HUMPHRIES: Yes, that's correct.

MR. LEARMONTH: Okay.

And can you tell me whether any cost-and-benefit analysis was ever done of the scrubbers and precipitators?

MR. HUMPHRIES: Not to my knowledge.

MR. LEARMONTH: Okay.

So this was a – and correct me if I'm wrong, please. I understand that the estimated cost of the addition of scrubbers and electrostatic precipitators was approximately \$600 million?

MR. HUMPHRIES: Yes, I think that's correct.

MR. LEARMONTH: And to your knowledge, based on what you know, can you confirm that this was not an environmental law requirement; it was just a preference by the province?

MR. HUMPHRIES: Yes, I think that's the case.

MR. LEARMONTH: It wasn't a legal requirement or –

MR. HUMPHRIES: Not that I'm aware of.

MR. LEARMONTH: – either of a federal or provincial law. So there was a choice to add the \$600 million, and that went into the capital – into – as an input into the CPW analysis?

MR. HUMPHRIES: Yes, it did.

MR. LEARMONTH: Which would have made the Isolated Island Option less attractive, is that right?

MR. HUMPHRIES: Well, it –

MR. LEARMONTH: Or more expensive.

MR. HUMPHRIES: – would have made it more expensive, yes.

MR. LEARMONTH: Yeah. But there was no cost-benefit analysis done of this?

MR. HUMPHRIES: Not to my knowledge, no.

MR. LEARMONTH: Okay, do you know why?

MR. HUMPHRIES: At the time, it – there was no negotiation. It was a directive: Include it. As far as I recall, I was told to put it in and that was it.

MR. LEARMONTH: Okay, so there was no – okay.

The – could you go to tab 6 which is P-00945? This is a document produced by the Commission counsel comparing the cost to refurbishing Holyrood and it adding scrubbers and precipitators to three brand new CCTs.

Now, if you look at these, would you agree that it would have been cheaper to simply forget about Holyrood or replace Holyrood with three brand new CCCTs? Would you agree that the capital costs of doing that would be less?

MR. HUMPHRIES: Based on capital, yes, it would.

MR. LEARMONTH: It would be. Okay.

Now, I understand that one disadvantage of adding CCCTs is that they, CCTs, would use diesel fuel which is slightly more expensive than the fuel that's presently used in Holyrood. Is that correct?

MR. HUMPHRIES: It's more expensive, yes.

MR. LEARMONTH: But adding three new 170-megawatt CCTs would have a greater capacity than Holyrood. Correct? Holyrood's about 460 megawatts?

MR. HUMPHRIES: Yeah, 460, 470, somewhere around there. Yeah.

MR. LEARMONTH: Yeah, but the cost of three 170-megawatt CCTs would be less than \$600 million. Do you agree with that?

MR. HUMPHRIES: The capital cost would be, yes.

MR. LEARMONTH: Yeah. And, of course, if you – if there were three brand new CCCTs to replace Holyrood, they'd obviously have a longer life because they'd be brand new. Is that correct?

MR. HUMPHRIES: Yes, yes.

MR. LEARMONTH: Okay.

And is another advantage of a CCCT over the Holyrood facility, that Holyrood needs to run all winter and at a level of at least producing 70 megawatts, whether you need it or not, but the CCT can be turned on and off quickly?

MR. HUMPHRIES: Yes, that's correct.

MR. LEARMONTH: So that means that there would be some saving in that regard, in that focus?

MR. HUMPHRIES: There would be some, yes.

MR. LEARMONTH: Okay.

So why – or I shouldn't say why. Do you have any information as to whether, in considering the Isolated Island Option, the replacement of

the Holyrood facility with three 170-megawatt CCCTs was not considered?

MR. HUMPHRIES: Yes, I – in one of my interviews the question was asked and I – and my assumption at that time, which I have since confirmed, was that we did do an optimization of the Isolated plan stand alone, on its own. And the cost of putting in the scrubbers and precipitators and continuing to operate Holyrood 'til its scheduled retirement dates – which I think was in the early 2030s for units 1 and 2 and 2036, I believe, for unit 3.

And there was a cost comparison done at that against putting in three brand new CCCTs from the start and the CPW preference was compared and – oh, at – oh, the difference was there was a \$700-million dollar preference to continue with Holyrood 'til its scheduled end of life as opposed to converting to the CCCTs.

MR. LEARMONTH: And that would have been using the fuel forecast that was used?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: That would have been based on the fuel forecast –

MR. LEARMONTH: The 50-plus –

MR. HUMPHRIES: – of the day.

MR. LEARMONTH: – years –

MR. HUMPHRIES: Yeah.

MR. LEARMONTH: – fuel forecast.

MR. HUMPHRIES: Well, you know, the analysis really only covers the period after 2033 anyway, because the –

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: – Holyrood units are gone then anyway.

MR. LEARMONTH: Yes.

The – do you agree that there's a – I know there was some upgrade to the type of fuel that was used at Holyrood, but do you agree that there's an even cleaner fuel available that would reduce the emissions by another 10 to 15 per cent?

MR. HUMPHRIES: Yeah, I think there is one further step. We are now down to 0.7 per cent sulphur, I believe it is. Again, I – from recollection I think there is one lower grade, and as for what the actual cost savings is, I don't recall or (inaudible).

MR. LEARMONTH: But wouldn't that have been – but did you study that for the purpose of assessing Holyrood and the inputs related to Holyrood in the CPW analysis?

MR. HUMPHRIES: Yeah, I'm – I think there was analysis done. And I can't recall now but there seems to be, to me, that there was some issue with, again, with going with the lower sulphur fuel, but I'm not positive on that.

MR. LEARMONTH: You're not sure about that?

MR. HUMPHRIES: I'm not sure, but for some reason it's in the back of my mind that 0.7 was as low as we practically could go. But, again, that's a recollection, and my recollection may not be correct, but that's – there was some issue there and I just can't recall what it was.

MR. LEARMONTH: Okay.

Now, this this is just a –

MR. HUMPHRIES: I might note another fact as well: That once the scrubbers and precipitators were in, you would have the ability to go back to the higher sulphur fuels then and – which are cheaper – and there would have been a cost savings there that was incorporated into the CPW analysis.

MR. LEARMONTH: Now, I want you to go the Hatch report. That's tab 9 at page 33.

THE COMMISSIONER: 00057.

MR. LEARMONTH: P-00057, tab 9, page 33. Have you got that, Sir?

MR. HUMPHRIES: Yes, yes, I do.

MR. LEARMONTH: Okay.

Now, can you explain the comments here on the bottom that – the paragraph third from the bottom: "With an additional 150 MW in 2035 or soon after, the total installed wind capacity would be 375 MW plus the refurbished/replacement of 50 ... for a total of The gross wind energy" would be one four, et cetera. And then: "In the Vista modelling done for ... the average operating levels for the Meelpaeg and Long Pond reservoirs increase ... over 2 m in 2020," 1 m in 2025 and 1 "This is the primary causative factor for increased spill, lower hydro generation efficiencies, and thus reduced thermal displacement efficiency."

Can you explain your interpretation of that, or state your interpretation of that?

MR. HUMPHRIES: Okay. So, basically, what the Hatch analysis was measuring was measuring the efficiency of the wind to be able to displace fuel at Holyrood, up to a level of that – without materially affecting the reservoir levels and spill –

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: – on the Island.

MR. LEARMONTH: Yeah, so what's the effect of that?

MR. HUMPHRIES: Well, it's affecting that you're doing – you're probably doing your best to maximize the energy out of both your hydro resource and your wind resource and minimize the output from Holyrood.

MR. LEARMONTH: All right.

And then just turn back to page 31 of that exhibit, Exhibit 00057. This is the Hatch report. Last paragraph: "The wind efficiency is much higher in this case as compared to the analysis with minimum thermal generation. The efficiency of displacing thermal generation is over 90% all the way up to 300 MW of new wind generation, and drops to 78 ... for the next 100 MW increment. This indicates that significantly more wind development could

potentially be economically viable without the thermal minimal constraint.” And that’s the 70 megawatts we talked –

MR. HUMPHRIES: That’s the –

MR. LEARMONTH: – about year, yeah.

MR. HUMPHRIES: – 70 megawatt minimum –

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: – at Holyrood.

MR. LEARMONTH: Yeah. However, it will likely be before the mid-2000 before Holyrood will be replaced as a generation source capable of operating.

So what I’m suggesting in this is that if, instead of, you know, improving the Holyrood facility, three 170 megawatt CCTs replaced the Holyrood facility, then that would allow for increased capacity for integrating wind into the system, is that correct?

MR. HUMPHRIES: On paper, yes, it would, and, obviously, economically, yes, it would, but it still doesn’t address the technical concerns that haunt me, that we will have on the Isolated system.

You know, I look at that 375 megawatts that we are – 350 I think we’re – we bottomed out in, as the maximum that’s acceptable from an operational perspective and a system security perspective.

MR. LEARMONTH: Well then do you disagree with what Hatch said at the –?

MR. HUMPHRIES: No. Yes, you could do it, you could integrate it but it doesn’t – the stability piece – that doesn’t address the stability piece.

MR. LEARMONTH: But would not unexpected, Hatch would put that reservation in there if, you know, they thought –

MR. HUMPHRIES: And I think they do eventually. That – they recommend that we only increase to the – what’s consistent in the

industry now on isolated systems, which is a 10 per cent penetration rate based on energy and that relates back to the 350 megawatts, approximately, that we’ve incorporated.

MR. LEARMONTH: By using CC – C3 – CCCT –

MR. HUMPHRIES: Doesn’t make any difference to the stability issue.

MR. LEARMONTH: As opposed to – what about display, not using the 70 megawatts that –

MR. HUMPHRIES: In order to do that –

MR. LEARMONTH: (Inaudible.)

MR. HUMPHRIES: – you would end up adding more wind and your install capacity would be higher than your technical stability limits.

MR. LEARMONTH: Now, the next item I wanted to consider was natural gas. Were you involved in a process whereby natural gas was screened out as an option?

MR. HUMPHRIES: Not really, other than we would’ve provided the volumes or the amounts of energy we would need to supply the requirement. After that, the analysis would’ve been done by people in the oil and gas division.

MR. LEARMONTH: Okay, and what about LNG?

MR. HUMPHRIES: Same thing.

MR. LEARMONTH: Same thing. So you don’t have anything to offer on that, do you?

MR. HUMPHRIES: No, not really.

MR. LEARMONTH: Okay.

Now, the next category I want to discuss is small island hydro, and there are three small island hydro facilities that are contained in the Isolated Island scenario.

MR. HUMPHRIES: Expansion plan, yes.

MR. LEARMONTH: Yes, yeah.

Now, I understand that in 1998 government put a moratorium on small hydro with the exception of the three facilities that are named in the Isolated Island option. Is that ...?

MR. HUMPHRIES: That's correct.

MR. LEARMONTH: Can you tell me the circumstances surrounding that moratorium, to the best of your knowledge?

MR. HUMPHRIES: Yeah, okay.

Prior to that, I would say starting in the early 1990s, there was an effort, or a move afoot, by independent power producers to allow the development of small hydro projects within the province as – on a non-utilities generator. So these would be independent power producers. They'd build the plants, generate the energy and sell it to Hydro. There was a move to try to create a small hydro industry in the province.

The government, initially, I think, embraced this and Hydro got involved. And there was a fair bit of information out there on hydro potential in the province that had been compiled over the years. Most of these projects were things that Hydro really didn't have an interest in for a number of reasons, either cost, environmental concerns, difficulty in construction, non-dispatchability; these types of things. So they were all projects that were not in Hydro's portfolio and probably would never end up in Hydro's portfolio. But the thought was, yeah, we can release some of these, and if people can develop them at a competitive cost, we would look at buying them.

So we did issue an RFP in '92, I believe, and – looking for up to 50 megawatts of small hydro. And, as I recall, the request was done in two phases. There was an initial expression of interest, which the projects came in, and I think we did have probably 30 projects in that – to that response.

And then Hydro, when some of these projects would have been interconnected to Newfoundland power system, we did an assessment of the impact of interconnecting them to the system, provided the proponents with an estimated cost of interconnection. And then they went away and came back with a bid.

And there was a ceiling price on the bid. It was just under 7 cents, I think. And they were encouraged – they could bid up to that rate; obviously, it was – anything lower would have been better.

So, out of that, I believe, there were 11 projects came in in the final proposal phase. And we actually evaluated and awarded four. There was a total of 38 megawatts. There was the Rattle Brook project, which is a four-megawatt project up in White Bay, near Cat Arm. That was accepted and is built and operational today.

There was a Star Lake project in Central Newfoundland that, at the time it was being developed – it was in the Abitibi watershed, and it was being developed by Abitibi. That was 15 megawatts. And there were two projects on either end of Terra Nova National Park – Northwest and Southwest Brooks, I think they were called – and they were, I believe, 12 and 7 megawatts respectively, for a total of 38.

As I said, the Star Lake and Rattle Brook were developed and placed into service in the later '90s, and – but there was a huge public outcry against the two projects near Terra Nova National Park. There was interest from the salmon association, the Boy Scouts and Girl Guides – they had their camp in the area – and anyway, these projects were halted by the government.

The projects were stopped, never developed. The component – the proponents I think were paid their costs, and the moratorium on small hydro resulted shortly after or at the same time.

MR. LEARMONTH: For environmental reasons?

MR. HUMPHRIES: Well, I don't know if it was all environmental or a combination of environmental, public concern. You know, it ...

MR. LEARMONTH: So at the DG2 stage, am I correct that in the – in completing the screening analysis of small-scale hydro, Nalcor decided to screen out all options except the three that were contained –

MR. HUMPHRIES: That's correct.

MR. LEARMONTH: – in the Isolated Island Option document that I referred to earlier?

MR. HUMPHRIES: Yes, that's right.

MR. LEARMONTH: So there was no consideration given to them at all?

MR. HUMPHRIES: Well, I – you know, they've been given due consideration a number of times over the years, and basically nothing was changing on these projects. You know, if anything, they would probably be more difficult to develop environmentally as time went on than in the past.

As of – when Navigant did the analysis on our work back in – at the time of DG2, they did do, as I recall, an evaluation of – took some of the information from the RFP bids of 1992 and did a projection on that – if some of these projects were released and were allowed to be built, what they would cost. And their determination was that they would be more expensive than wind and that basically they provide the same role as wind would provide.

So there was no real preference for Gull, reopening that story.

MR. LEARMONTH: So all the studies you'd done in the past, they weren't revisited?

MR. HUMPHRIES: No, not in 2010 or 2012. They had been revisited many times before.

MR. LEARMONTH: Okay, now, there's a document – perhaps we could bring up P-00077, and that's in the common exhibits binder. It's also at tab 7 of your documents.

Sorry, it isn't at tab 7 –

MR. HUMPHRIES: Yeah, no –

MR. LEARMONTH: – (inaudible). It's – if we can bring up P-00077 and then go to pages 97 to 99.

MR. HUMPHRIES: P-00077 is tab 1.

MR. LEARMONTH: It will come up on your screen.

MR. HUMPHRIES: Okay.

MR. LEARMONTH: Okay.

P-00077, so – now, in this document, do you agree that the reasons for eliminating all small hydro apart from Island Pond, Round Pond and Portland Creek were – there was three reasons: the 1998 moratorium; the fact that most, although not all, of these small hydro projects were non-dispatchable; and it was more expensive than wind – they were more expensive than wind.

MR. HUMPHRIES: Generally, yes, that's the three.

MR. LEARMONTH: Were those the three reasons?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: As far as you recall?

MR. HUMPHRIES: Yeah.

MR. LEARMONTH: Okay.

What analysis was done to determine that development of these small hydro projects was more expensive than wind?

MR. HUMPHRIES: The analysis was completed by Navigant. They basically took the data that was actually bid in the 1992 RFP, the actual bid prices that the proponents had put in, and brought them up to a current cost and compared it to wind.

MR. LEARMONTH: So that was based on a study done by Nalcor?

MR. HUMPHRIES: Navigant would have done the work as part of the review of our whole screening process, and it's in – there was a report Navigant completed.

MR. LEARMONTH: Okay, and then the other – that's one reason that it was more expensive than wind, or believed to be, and then there's a 1998 moratorium, that's the second reason, and then the fact that some of these project had – the energy that they would produce would be non-dispatchable?

MR. HUMPHRIES: Yeah, that was a fact, but that was really no different than wind either, right? Wind – both – neither wind nor small hydro are dispatchable. So they would basically satisfy the same purpose. Wind and non-dispatchable small hydro would serve the same purpose in your portfolio.

MR. LEARMONTH: Okay. Now, some of the sites that were excluded would be on the Exploits River, like Badger Chute and Red Indian Falls on the Exploits River. Are you familiar with those?

MR. HUMPHRIES: Yes, somewhat.

MR. LEARMONTH: And do you agree that those sites benefit from considerable upstream storage at Red Indian Lake, Star Lake and Twin Lakes?

MR. HUMPHRIES: Yes. Yes, they do.

MR. LEARMONTH: So that would give them – that would convert them from – into a dispatchable (inaudible).

MR. HUMPHRIES: Well, I –

MR. LEARMONTH: Is that correct?

MR. HUMPHRIES: I put it as quasi-dispatchable.

MR. LEARMONTH: Okay, explain that please.

MR. HUMPHRIES: Well, Red Indian Lake is a fair distance from the site of the generation at the current Abitibi – what was the former Abitibi generation, now operated by Nalcor, that's in the Bishop's Falls-Grand Falls area. The reservoir is at Red Indian Lake some distance away. And I stand to be corrected, but I think it's in the ballpark, the number, that if you release water at Red Indian Lake, it takes about 18 hours for it to get down to the generation site.

So while it is dispatchable, it's – somewhat – it's not on-the-dime dispatchable. It takes time for the water to get down. So the level of dispatchability is – you could probably prevent spilling water, but to be able to use the unit to

react to a load, you have to have a well-advanced notice there's a load.

MR. LEARMONTH: So why was it excluded? (Inaudible) –

MR. HUMPHRIES: Well, I think – and that was part of it. But I think, as I recall, that the people within Hydro's engineering department with expertise in hydro looked at them, and – as well as our environment department – and they determined that it would be a challenge, both environmentally and from an engineering and construction perspective, to develop these projects and that it was questionable whether they would receive an environmental approval for them or not.

MR. LEARMONTH: But what was the environmental issue as you recall it?

MR. HUMPHRIES: Well, I think there was a fair bit in additional flooding. As I recall, one of them – that the actual Buchans highway would have to be rerouted and that where the highway is today would be underwater. They were not insignificant things that – and there was a fisheries piece there as well with the Exploits River.

MR. LEARMONTH: Yeah. And finally on that Exploits River hydro possibility, I think if you go to tab – Exhibit P-00130, that's tab 13 at page 2, you'll see that there's another – in addition to Badger Chute and Red Indian Falls, which I mentioned earlier, there's another facility: Four Mile Pond.

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Okay. Can you tell me anything about Four –?

MR. HUMPHRIES: I'm not overly familiar with that and I haven't reviewed it.

UNIDENTIFIED MALE SPEAKER: That's P-01030.

MR. LEARMONTH: Yes, sorry. Yes, 01030, yeah.

So you don't – you didn't give any consideration to that?

MR. HUMPHRIES: No, I think that the – I seem to recall that it was the Badger Chute project that was given the more consideration than the others from a – but, again, they were all reviewed, I think this Newfoundland Hydro document, this was a document I was speaking to – speaking about – looked at all three of them.

MR. LEARMONTH: Okay.

If we go to P-00159, that's tab 14. That's: An Inventory of Small Hydro Sites for Energy Supply, Volume I, prepared by ShawMont in December 1986. And if we go to pages 5 – turn to page 5 first. Under Recommendations – Roman numeral iii at the bottom: The following recommendations are noted to assist Hydro, et cetera “that possibilities for upstream storage and watershed diversions be further reviewed. [In areas where access to upstream structures is difficult, consideration should be given to innovative design and construction ... such as use if winter roads, transport”

Now, this was a recommendation that further investigation be made of this point – on this point. Was it ever done, to your knowledge?

MR. HUMPHRIES: I don't know. Back in '86 I was not involved in the generation piece and I don't recall what extra work may or may not have been done.

MR. LEARMONTH: All right. So you don't really have any information on that, do you?

MR. HUMPHRIES: No, I don't.

MR. LEARMONTH: Okay.

Now, I suggest to you that there are quite a few small hydro projects that do have storage capacity and therefore they would make them more appealing because they'd be dispatchable. Is that correct?

MR. HUMPHRIES: If they have storage, yes, they're dispatchable so they would be more attractive.

MR. LEARMONTH: Okay. So let's look at Exhibit P-00951, that's at tab 15.

And this is – on page 1, it's a reference to the Silver Mountain (Upper Humber) Hydroelectric Development. You familiar with that?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Okay. What can you tell us about that proposal?

MR. HUMPHRIES: That proposal, to begin with, I guess, Kruger or Corner Brook Pulp and Paper have the water rights to that site as part of their entitlement on the Humber River. And in 1996, they would've been trying to initiate this project because, I think it was shortly after that in 1997, we did – Newfoundland Hydro did go out with an additional RFP for generation – up to 200 megawatts at that time – to supply a potential nickel smelter at Argentia. And they would've been preparing to submit that proposal in response to that RFP.

And there were no restrictions on that RFP. It wasn't just small hydro. It could have been thermal co-generations. So, at that time, Kruger would have been trying to move that project forward to – as a submission to that RFP process.

MR. LEARMONTH: Well, how did that turn out?

MR. HUMPHRIES: Well, we went through the RFP. The – we did solicit the bids and bids came in and they were evaluated and compared against our own alternative. I'm not positive, I'm thinking at the time that the hydro proposal alternative was the preferred alternative coming out of it. I'm not 100 per cent confident of that. Again, I wasn't directly involved back then. I was still in the transmission side. But, at the end of the day, the (inaudible) didn't materialize either and the requirement disappeared and there was no further action, at that time, anyway.

MR. LEARMONTH: Yeah.

See what I'm getting at is there were a number of projects that had storage capacity that appears were not considered. I'm gonna go through a few more, I just wanted to make you understand what track I'm on.

MR. HUMPHRIES: Yeah. Well –

MR. LEARMONTH: And I understand your reason for saying that the run-of-river, small hydro facilities would not be worth following because they're non-dispatchable.

MR. HUMPHRIES: Right.

MR. LEARMONTH: But that doesn't apply to the –

MR. HUMPHRIES: It doesn't apply to Silver Mountain, but Newfoundland Hydro didn't have the rights to develop Silver Mountain anyway; they were vested with Kruger. As were, at the time, the Badger Chute and they were vested with Abitibi Consolidated. So they would not be – it would not be at Hydro's discretion to develop themselves. The water rights rested with those customers.

MR. LEARMONTH: But they could've been approached –

MR. HUMPHRIES: Oh, they could've been –

MR. LEARMONTH: – if there was interest.

MR. HUMPHRIES: – approached and, more often than not, they approached us, and that happened a number of times, as well.

MR. LEARMONTH: But they weren't approached at the time of the screening process, is that right?

MR. HUMPHRIES: No, no –

MR. LEARMONTH: Kruger?

MR. HUMPHRIES: – they weren't and, you know, and I don't recall where the ultimate environmental assessment with the Silver Mountain went, but Silver Mountain was – did have, as I recall, environmental sensitivities. It – what they were proposing for the interconnection – tapping the 230 kV line coming from Cat Arm; that wasn't acceptable from a reliability perspective. It would have involved a longer line back down to Deer Lake, and those types, so there were issues associated with them – with it.

And I don't know what the cost of – I don't recall what the cost of it was.

MR. LEARMONTH: Anyway, that wasn't pursued.

MR. HUMPHRIES: It wasn't pursued.

MR. LEARMONTH: Okay.

Okay, if you go to P-01029 at tab 16. This is a March 31, 1977 feasibility study on Burgeo that analyzes two distinct sites near Burgeo; that's – first is Northwest Arm at page 10 and Dry Pond. And both sites have significant storage. Do you acknowledge that?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Yeah, they weren't considered also, were they?

MR. HUMPHRIES: No, they would have been evaluated previously through our normal screening process and screened out for whatever reasons; 1977, I don't recall (inaudible).

MR. LEARMONTH: No, I'm just wondering why wouldn't these – why wouldn't all these small hydro projects, where there – which had storage capacity – why would they not have been re-evaluated to go back and look at them and – perhaps with –

MR. HUMPHRIES: Because –

MR. LEARMONTH: – greater technology –

MR. HUMPHRIES: – well –

MR. LEARMONTH: – and improvements in construction and so on that they may have been a good alternative?

MR. HUMPHRIES: They – I – maybe, maybe not. But, you know, they have been looked at and they have been screened out for a reason. And, for the most part, I think we would have gone back and asked that – or it's probably – might have been even documented somewhere that there is really no benefit to pursue these any further.

MR. LEARMONTH: Yeah. But they were screened out, like, with one stroke of the pen, as I understand it.

MR. HUMPHRIES: Well, it was once –

MR. LEARMONTH: Only the three that were included in the Isolated Island were actually considered.

MR. HUMPHRIES: Yeah, well, you know, there was – there'd been a fair bit of analysis and planning over the years that led us to that point that – where we got to, that these three projects were in. They didn't fall out of the woodwork at – in 2012; they'd been on the books and identified for a long time –

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: – just as long as some of these had.

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: And they made the cut and the others hadn't.

MR. LEARMONTH: Okay, P-01028, it's tab 18.

MR. HUMPHRIES: Tab 18.

MR. LEARMONTH: That's a feasibility study of a development at Lake Michel on the Great Northern Peninsula. You – are the familiar with that?

MR. HUMPHRIES: Generally I'm familiar, yes.

MR. LEARMONTH: Okay and if you go to page 98 of that document you'll see that it has significant storage. Is that true?

MR. HUMPHRIES: Page 98 you say?

MR. LEARMONTH: Ninety-eight.

MR. HUMPHRIES: Yeah. Yes, okay.

MR. LEARMONTH: It had significant storage. Do you confirm that?

MR. HUMPHRIES: Yes, this particular scheme would've had storage.

MR. LEARMONTH: Okay. And that would've been dispatchable, correct?

MR. HUMPHRIES: Yes, it should've been.

MR. LEARMONTH: Yeah.

Okay and then P-01027, tab 19; it's a study of Ten Mile Lake on the Northwest Coast. And schemes 2 and 3, as indicated on page 6 and 7 of the exhibit, have significant storage. Can you confirm that?

MR. HUMPHRIES: Based on this report, yes.

MR. LEARMONTH: Do you have any reason to question the accuracy of this report?

MR. HUMPHRIES: No, I don't.

MR. LEARMONTH: Oh, okay.

Tab 20, Exhibit P-01025; this is an overview of hydroelectric projects in the Bay du Nord and Main Rivers at pages 8 to 10. And can you confirm that the Main River development had significant storage capacity?

MR. HUMPHRIES: Yes, it appears to. Yes.

MR. LEARMONTH: Okay.

Once again, do you know why this wasn't considered – reconsidered at the time of the screening process?

MR. HUMPHRIES: Well, I'm assuming it's because of the environmental or construction cost concerns that would've been raised. And, you know, it would've been dismissed in – probably when the reports were done. And I do know that in the early '80s, prior to the – or around the time that the ShawMont document was created there was another review of the hydro resources there to determine that – if there was any benefits or – to hydro to further look at these to develop them. And that would have been advance – in advance of opening the doors to the independent power producers, that there was a review done at that time. Now, I'm sure it wasn't a detailed engineering review, but to update the thoughts on the findings and to – and from that, these projects would have been, again, screened out and not pursued.

You know, it's – this would have been done. Again, I wouldn't have been directly involved with any of it, but I do know there was an effort that when the – we got into the process of waiving water rights and looking at independent power producers, there was an effort given to ensure that there was stuff here that we wouldn't do ourselves.

MR. LEARMONTH: But they weren't considered in the same (inaudible) year.

MR. HUMPHRIES: No, at – in 2012 they weren't considered – or 2010, no, because they had already been previously screened out.

MR. LEARMONTH: Even though they had storage capacity.

MR. HUMPHRIES: Even though they had storage, yes.

MR. LEARMONTH: Okay, I'm just going to go through a few more; there's many, many, but I'll go through a few more.

If you go to tab 21, it's P-01138. And this is for Dry Pond Brook, Pinware River – we won't count that because that was in Labrador and there was no way to bring the power to the Island but, anyway, for the time being we'll forget about that – Lake Michel and Cloud River. We've already discussed Cloud River. Once again, I suggest that these had significant storage capability. Do you agree?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Yeah.

Tab 22; this is the second volume of the – excuse me, 01023. This is the second volume of the ShawMont report that Nalcor mentioned in its PUB submission. And as we discussed, most sites don't have storage, the ones referred to in this report, but some do, including the following.

If you go to page 31 you'll see the Gisborne Lake development which has, apparently, 52-million cubic metres of storage. Do you agree with that?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Page 166, The Maccles Lake project has 40-million cubic metres of storage.

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Page 323, Indian Bay Brook has 10 million cubic metres of storage.

MR. HUMPHRIES: Yes.

MR. LEARMONTH: And page 329, that Lewaseechjeech Brook – I probably haven't pronounced that wrong – right. That brook project has 25 million cubic metres of storage?

MR. HUMPHRIES: Yes, that's correct.

MR. LEARMONTH: Yeah.

Page 378, Lloyds River has – site has 29 cubic million cubic metres of storage in one version, or if we go to page 366, 39 million cubic metres in another. Do you acknowledge that?

MR. HUMPHRIES: Yes, I do recall Lloyds River was a project that was looked at a number of times in various configurations and was never advanced for reasons I'm not aware of.

But I just – I think it's important to say here that these – a lot of these – most of these reports are high-level screening reports. And based on that you would make a judgment that before these projects would make it into your portfolio, they would need to go through a couple of levels of further feasibility study and cost –

MR. LEARMONTH: Right.

MR. HUMPHRIES: – development before they get there. And based on – decisions would have been made based on the information of these reports and whether there was value in further pursuing the level – other levels of feasibility.

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: So even if – when we talk of getting to 2010 or 2012 when we did our screening, we would not have been able, really – they have been screened based on this previous, but to get it to a level where we would include it in a portfolio, it would have had to gone through

and passed the other levels of feasibility as well and have a more definitive cost and –

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: – energy profile.

MR. LEARMONTH: And I'm not suggesting to you that these were projects that should definitely have been pursued, what I'm suggesting to you is that these projects should have been reconsidered as part of the screening process. It may have been that they were – they would be rejected again, but I'm suggesting that they should have been reconsidered on some level before they were discarded as options.

MR. HUMPHRIES: Yeah and I think from time to time they had been.

MR. LEARMONTH: But not at D –

MR. HUMPHRIES: Not at DG2.

MR. LEARMONTH: No, or 3, obviously. Yeah.

Okay, just a few more. Page 387 of that report; Mary March's Brook project had – seems to have had 88 million – page 387, yeah. Mary March's Brook project appears to have had 88 million cubic metres of storage. Do you acknowledge that?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: And page 400; New Bay River project appears to have had 12 million cubic metres of storage.

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Page 517; one of the Torrent River sites had apparently 23 million cubic metres of storage?

MR. HUMPHRIES: That's correct.

MR. LEARMONTH: Okay.

And then if we –

MR. HUMPHRIES: And, again, Torrent River was another site that ultimately in one of the – I

don't think it was a site with storage; it would've been a run-of-the-river site that got waived and proposed by a proponent back in the '92 RFP.

MR. LEARMONTH: If we go to tab 23, that's Exhibit P-01137. This is an October 25, 1971, summary entitled: International Correspondence Memorandum from H. R. Young, Planning Engineer. He was – and then the next page 2 says: The Newfoundland and Labrador Power Commission. So that's – what is the Newfoundland and Labrador Power Commission?

MR. HUMPHRIES: That was –

MR. LEARMONTH: That was –

MR. HUMPHRIES: – the forerunner of Newfoundland and Labrador Hydro.

MR. LEARMONTH: – the same thing. Yeah, okay.

Now, if we look at – so this is a summary of existing sites. If you go to page 10 there's a description of that document, 01137 – description of the Lower Terra Nova project. And the proposal was diverting the Terra Nova River through Terra Nova National Park into Clode Sound and that would allow good storage and flow regulation. And it would have 82,000 horsepower, which would be translated into 61 megawatts of capacity, so it's a fairly big facility. Was anything done with that?

MR. HUMPHRIES: No. That's in the heart of Terra Nova National Park. That would –

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: – would never be touched.

MR. LEARMONTH: That wouldn't be possible to –?

MR. HUMPHRIES: I don't think so. I wouldn't want to tackle it.

MR. LEARMONTH: It wasn't considered anyway.

MR. HUMPHRIES: Not – I mean, not – I don't remember this being considered. In 1971 I was 9

years – 10 years old, or something like that, 11 years old.

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: And it – no, I don't – you know, I don't recall anything in Terra Nova National Park being even considered in my – the length of my career.

MR. LEARMONTH: Would that be for environmental reasons?

MR. HUMPHRIES: Well, environmental and a lot of other, I would say.

MR. LEARMONTH: Okay.

And the last reference I'm going to make is page 29, which is a reference to a 1952 study showing the possibility of creating a large reservoir, the Bay du Nord wilderness reserve, to support a project that would produce 35 megawatts of power. Was that considered?

MR. HUMPHRIES: Not to my knowledge. What is the date on that?

MR. LEARMONTH: Yeah, 1952.

MR. HUMPHRIES: Oh no. No, that wasn't debated. That's a wilderness reserve now, you know. That's –

MR. LEARMONTH: So that wouldn't be possible?

MR. HUMPHRIES: I guess anything is possible –

MR. LEARMONTH: Yeah. Yeah.

MR. HUMPHRIES: – but probable? I doubt it.

MR. LEARMONTH: Yeah. Now, often in your evidence you mention environmental concerns.

MR. HUMPHRIES: Yeah.

MR. LEARMONTH: You agree.

But what I don't – and I understand environment is very important, but it seems to me that in proposing, and ultimately developing the

Muskrat Falls Project, that one could argue that not much consideration was given to the environment in Labrador.

So, if it was important – if these environmental considerations were important for the Island, why wasn't the same consideration given to environmental concerns in Labrador, where you're, you know –

MR. HUMPHRIES: I –

MR. LEARMONTH: – doing major work in a river –

MR. HUMPHRIES: I can't say that the concern wasn't given to it. I mean, in the – Muskrat Falls went through an environmental process –

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: – as would any of these projects here. But given the – and, I mean, there's an order of magnitude piece here, as well. A lot of these developments we're talking about here are pretty small. So – and they do have a lot of disruption, some of them probably even more disruption than we see at Muskrat Falls.

So there was a general feeling that a lot of these projects, at least on the Island, would not make it through the environmental process; however, Muskrat Falls was put through the environmental process and it was approved, so ...

So to say that you ignored the environment, I don't think that's correct.

MR. LEARMONTH: Well, I don't want to get in a debate – you're not the right person – but I think some groups – Indigenous groups and Labrador land keepers and Riverkeepers – might argue that the recommendations of the Joint Review Panel were not followed; for example, the methylmercury issue is still unresolved. So I know you're not the right person to discuss that –

MR. HUMPHRIES: Yeah, I – you know, that's –

MR. LEARMONTH: – but I think there’s a point there that perhaps others will pursue. I’m not going to pursue it any further.

THE COMMISSIONER: I wonder if this should be a spot for our break. I see we’re a half hour later than I usually take it; I didn’t realize we were that late this morning.

MR. LEARMONTH: Okay, I won’t be too much longer, but we can break now. That would be fine.

THE COMMISSIONER: All right, let’s take 10 minutes now then.

CLERK: All rise.

Recess

CLERK: All rise.

Please be seated.

THE COMMISSIONER: Okay, go ahead, Mr. Learmonth.

MR. LEARMONTH: Thank you.

I just have a few more points I wanted to put to you. You said in your testimony earlier that someone told you to put the \$600-million Holyrood refurbishment amount into the CPW analysis.

MR. HUMPHRIES: Yes, we were told.

MR. LEARMONTH: Who?

MR. HUMPHRIES: I don’t recall. It was a given when we looked at the scope and the inputs.

MR. LEARMONTH: You said you didn’t do it, so that means you didn’t make the decision. Is that what you said?

MR. HUMPHRIES: No, I didn’t make the decision, but –

MR. LEARMONTH: But who did?

MR. HUMPHRIES: In my understanding, it was based on the directives that were in the

Energy Plan. And we were told to do it based on that.

MR. LEARMONTH: But who told you to do it?

MR. HUMPHRIES: I don’t know. Somebody from the project team, I guess.

MR. LEARMONTH: Do you know who?

MR. HUMPHRIES: No, I don’t. I don’t recall.

MR. LEARMONTH: Well, do you – can you say with certainty that it was someone from the project team?

MR. HUMPHRIES: I can’t even say with certainty, no, that it was, but I assume that’s where –

MR. LEARMONTH: Okay.

MR. HUMPHRIES: – it’d come from.

MR. LEARMONTH: And also, another point I wanted to clarify that – when I asked you about the – this question about the sensitivities for the – for DG3.

MR. HUMPHRIES: Yes.

MR. LEARMONTH: You said that was something that was done by Investment Evaluation?

MR. HUMPHRIES: The actual calculations, I assume they were done using the same spreadsheet technology that was used at DG2.

MR. LEARMONTH: By Investment Evaluation?

MR. HUMPHRIES: Yes, as far as I’m aware.

MR. LEARMONTH: Okay. Now, the reason I ask is that Mr. – in the panel discussion in Labrador, Wednesday, September 26, Ms. O’Brien asked Auburn Warren – you’re familiar with him?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: On page 54, question: “And, Mr. Warren, I just wanna make clear. I understand that you – in Investment Evaluation, you could actually run sensitivities on fuel, and capex and interest rates, but you – am I right – you could not run sensitivities on load. Is that correct?”

Mr. Warren’s reply: “To run the sensitivities, you’d have to have Mr. Moulton run it through Strategist.”

And then Mr. – that’s what Mr. Warren said. And then Mr. Warren – Mr. Moulton said: “That’s correct.”

(Inaudible.)

MR. HUMPHRIES: I’m aware of that and I actually saw it; I was watching the testimony at the time. And when I went back and started to try to determine and remind myself what happened – and then I did involve Mr. Moulton, as well. I spoke to Mr. Moulton.

MR. LEARMONTH: But that’s not quite what you said this morning. You didn’t mention that this morning, I don’t think.

MR. HUMPHRIES: Mention what?

MR. LEARMONTH: Mention that you’d spoken to Mr. – I thought your evidence this morning was that that was something that Investment Evaluation would do.

MR. HUMPHRIES: I can – you can confirm through the evidence at the Public Utilities Board that was filed and there are sub-notes on the tables and saying that this was completed outside of Strategist. And the load sensitivities were included in that.

MR. LEARMONTH: No, but I – the point I want clarified is when this came up this morning, I don’t believe that you said – there will be a transcript, so I –

MR. HUMPHRIES: Okay, I –

MR. LEARMONTH: – stand to be corrected if I’m wrong. I don’t recall you mentioning that that’s something Mr. Moulton was – would do. I

believe the gist of what you said was that that’s something that Investment Evaluation would do.

MR. HUMPHRIES: And I did say that. And based on what was done at DG2 and how they were done at DG2, Investment Evaluation was quite capable of doing them the same way at DG3. And Mr. Moulton didn’t do the sensitivities, the load sensitivities, at DG2.

MR. LEARMONTH: Okay.

MR. HUMPHRIES: And, you know, I’ve gone back and confirmed that. He might have thought there was some runs done, maybe one or two runs to calibrate the model that was developed against Strategist, but the rest of the analysis was done outside of Strategist. And the information that was filed with the PUB, there are footnotes on the tables to that effect.

MR. LEARMONTH: So is that your answer? You don’t want to say anymore on it.

MR. HUMPHRIES: That’s my answer, yes.

MR. LEARMONTH: Okay.

Conservation and demand management – we were talking about these figures from the Marbek report, that, you know, 1.5 per cent and then you’d increase it up to 3 per cent over time. Are you familiar with what I’m talking about?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: But one thing I want clarification on, if you don’t start this process how are you going to ever move forward on it?

MR. HUMPHRIES: Well, exactly, you have to start it and move it forward.

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: And at 2012 I think that’s where we were. We were in the process of starting and moving forward.

MR. LEARMONTH: In the process of starting – but that was a long time after you should’ve started, I suggest.

MR. HUMPHRIES: Yeah, and, you know, the report was 2008 and I don't know when the initiative was finally started, but even up to 2000 – definitely in 2010 and even in 2012 I don't think there was conclusive evidence that we were gaining the – making the gains that we should've – excuse me – should've been making at that time.

MR. LEARMONTH: And was there a reason for that? I mean you were in charge of this department.

MR. HUMPHRIES: No, I was not in charge of it.

MR. LEARMONTH: You were the manager.

MR. HUMPHRIES: I was manager of System Planning.

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: So my job would've been to evaluate the alternatives and determine if they were valid alternatives.

MR. LEARMONTH: Mm-hmm.

MR. HUMPHRIES: And that would stand the test of time when the time came as we move forward and if CDM would be in the state it was at that time, a valid alternative. And I felt it – as we all did in System Planning – that it wasn't because there wasn't enough data there to confirm that you could achieve what the reports were saying you could.

MR. LEARMONTH: But would you need more than four months – four years to confirm that the Marbek report was –

MR. HUMPHRIES: Well, I think even in the four years, we hadn't achieved in the four years what we had anticipated.

MR. LEARMONTH: Anyway, it wasn't until 2012 that you got moving on this?

MR. HUMPHRIES: Well, you know, I – we got moving at – it's moving and it's – System Planning is not moving it, it's the division of Newfoundland Hydro dealing with energy efficiency and running the takeCHARGE

program. These are the people that are dealing with it.

MR. LEARMONTH: So you're saying that that was their responsibility?

MR. HUMPHRIES: Yes, to make –

MR. LEARMONTH: Actually, that –

MR. HUMPHRIES: – that program work.

MR. LEARMONTH: – group, I think you mentioned that this morning.

MR. HUMPHRIES: Yeah.

MR. LEARMONTH: Yeah, earlier this morning, I should say.

One other point, I – you gave evidence on the IRP, the integrated resource planning. And that never got underway, is that correct? Is that –

MR. HUMPHRIES: Yes.

MR. LEARMONTH: – a fair way to put it?

MR. HUMPHRIES: Yeah.

MR. LEARMONTH: And I've got a letter here, it's going to be entered as an exhibit. It's a letter from Mr. Geoffrey Young, senior legal counsel Newfoundland and Labrador Hydro, to the Board of Commissioners of Public Utilities dated November 12, 2008.

This will be entered as an exhibit. I just want to read you these paragraphs because this might refresh your memory as to why nothing was done about the IRP process. I'll just read the first two paragraphs on page 2:

“Were time and money unlimited, it would be possible to carry out full planning and engineering processes for two possible contingencies: a future where the island's long-term needs are met by the Lower Churchill Project and an HVDC link, and a future where the Island Interconnected System remains an isolated electrical system ... Though it is clear from the *Labrador Hydro Project Exemption Order* that the Board cannot participate in that planning process, the Board, the parties, and the

general public in the Province would be aware that, obviously, considerable planning and analysis is being carried out with regard to that project. The question remains whether it is of value to the ratepayer to do the analysis and pricing planned for an IRP process for the Isolated Island case at the time.

And then Mr. Young goes on to say: “In Hydro’s view, this would unavoidably involve a considerable amount of engineering and support work to prepare for a future that, very likely, will not materialize. Hydro understands that there is a requirement for two parallel generation expansion plans to be developed; its *Generation Planning Issues 2008 Mid Year Update* provides the analysis at the appropriate level of detail in In-feed and the Isolated Island cases. The question is to what level of detail” the “work should be done in advance of a decision on which of these paths the Province’s electrical energy will take. Carrying out this work to the level proposed by the Industrial Customers and ... Consumer Advocate is a very expensive proposition that would draw heavily upon scarce engineering and financial resources.”

So, were you familiar with that letter?

MR. HUMPHRIES: Generally, I think so. The concepts in it, yes, I am.

MR. LEARMONTH: Yeah, so that suggests to me – I’d like your view on it – that you weren’t putting any money into this.

MR. HUMPHRIES: No. No, we weren’t.

MR. LEARMONTH: So that’s the reason that the IRP process never – was never integrated or advanced at Hydro. Do you – based on this – what I just read.

MR. HUMPHRIES: Based on that, yeah, that seems to be –

MR. LEARMONTH: Okay.

I want you to look briefly at a document that was entered. It’s P-00322 which is an article in *The Telegram*, December 11 – excuse me – August 11, 2012, by Professor Jim Feehan. You’re familiar with him, are you?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: And I showed you this yesterday so you’ll be familiar with it.

MR. HUMPHRIES: Yes.

MR. LEARMONTH: I just wanted to run you through some of the – this is a summary of some of the thoughts that he had on why Muskrat Falls should not be developed and these were some suggestions. So I just want to take you through these briefly and see if you can give me some comments on any relevant points.

Okay, one, cleaner fuel. He says: “First, use higher quality fuel to generate electricity. Under the Isolated Option, Nalcor’s oil-burning plant at Holyrood, which generates about 15 per cent of the island’s electricity ... has to continue operating and would have to provide a rising share of electricity” And then there’s a reference to that \$590 million to install scrubbers. We’ve already dealt with that.

And then he says later on: “However, since 2005, Nalcor has reduced sulphur dioxide emissions, per megawatt ... hour of electricity generated, by about 65 per cent; particulates are down 75 per cent. This has been done by using cleaner fuel.”

And then he says: “There is an even cleaner fuel available that could reduce those emissions” to “another 10 to 15 per cent.

“It costs about 10 per cent more per barrel but it increases the plant’s efficiency so less of it is needed. Also, it gives off less carbon emissions, whereas installing those expensive scrubbers actually increases carbon emissions.

“Further reductions in sulphur and particulate emissions are desirable but not by increasing carbon emissions and burdening ratepayers with a \$590 million bill.

“Use the better quality fuel.”

So was there any consideration give to Professor Feehan’s suggestion that you use a cleaner fuel?

MR. HUMPHRIES: At the time there was no suggestion given.

MR. LEARMONTH: Has there been in the meantime?

MR. HUMPHRIES: I don't know.

MR. LEARMONTH: Do you know why? I mean on the face of it, I don't know how often these things are – when assessed there's technical reasons –

MR. HUMPHRIES: Yeah.

MR. LEARMONTH: – and so on. So I'm not saying that, you know, it was something that was obvious but –

MR. HUMPHRIES: As I said –

MR. LEARMONTH: – was this considered? Was this suggestion considered by Nalcor?

MR. HUMPHRIES: As I said earlier, I seem to recall that there was some issue and I don't even remember what it is in moving forward with the lower sulphur fuel.

MR. LEARMONTH: So you don't know whether anything was done with that?

MR. HUMPHRIES: No, I don't.

MR. LEARMONTH: Okay.

Well, if you don't know, I guess there's no point in me asking you why not, but you just don't know.

MR. HUMPHRIES: Yeah, I don't know.

MR. LEARMONTH: That draws a blank from you, does it?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Okay, fair enough.

Number two of five points Professor Feehan makes this – the: Better use the power we have. And he refers to the fact that the year before – which he acknowledged in his evidence was an unusual year; he wasn't saying this was a typical year. But he said: "Last year, the equivalent of about 800,000 MW ... was lost as water spilled over Nalcor's dams on the island."

He says: "That's huge! It's about 90 per cent of what Holyrood generated in the same year."

"Most of this lost potential electricity occurred in the main part of the island and is likely due to the closure of the Grand Falls mill" et cetera. So he's saying that the – one solution to this problem of spilling is upgrading the transmission system. Do you have any comment on that?

MR. HUMPHRIES: The actual spill is more related to the amount of actual turbine capacity installed to be able to turbine the water than the transmission. But, yes, there would be some impacts from the transmission system, but the bulk of the loss of the actual spill running over the dam was a combination if you didn't have the capacity to turbine it at the time and it's also a combination of load, that there wasn't enough – might not have been a load on the system to actually –

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: – absorb it if you had it.

MR. LEARMONTH: But would a – the suggestion that he makes of an upgrade to the transmission system –

MR. HUMPHRIES: I'm really not sure that an upgrade –

MR. LEARMONTH: – help?

MR. HUMPHRIES: It would help marginally but it would not eliminate the problem. It's – additional turbine capability would have alleviated that problem more than transmission upgrades.

MR. LEARMONTH: So did you see any merit to this recommendation?

MR. HUMPHRIES: Well, you know – and, you know, we were as part of the whole expansion process for both – either the Isolated or the Interconnected case, we were upgrading the transmission system, we were building an additional 230 kV circuit from Bay d'Espoir to Western Avalon to alleviate transmission bottlenecks and better be able to move power from Central and Western Newfoundland to the

Avalon where the load centre is. That was already in the works and being done and it's in service today.

MR. LEARMONTH: All right.

The third: More wind – I think we've talked about that.

MR. HUMPHRIES: Yeah. Yeah, I think we did.

MR. LEARMONTH: Number four – this is on page 2 now, Mr. Humphries – Bring in smaller hydro. And we've covered a lot of –

MR. HUMPHRIES: Yeah. And, you know, small hydro and wind go – they're hand in hand. You can't bring in unlimited amounts of either of those.

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: For dispatchability and reliability reasons.

MR. LEARMONTH: And he makes the point that I alluded to earlier at the bottom of the first column on page 2: "Furthermore, if Muskrat goes ahead, think of all the rivers, wilderness areas, hunting grounds and watersheds that would be affected by that project's hundreds and hundreds of kilometres of transmission lines."

And so this was the point I was making that the environment of Labrador is an important –

MR. HUMPHRIES: I agree.

MR. LEARMONTH: – point also. Yeah.

Reduced demand – now, we've talked about that, to a certain extent, earlier today. But there is this – on the demand side of this policy consideration, there's the time-of-use pricing. In other words, consumers pay the standard rate for most of the day but at peak hours, to be designated, they would pay a higher amount for their use of electricity. And apparently this is, you know, the objective is – he states is to get people to shift some of their electricity consumption to off-peak hours.

Has any – up until the time of sanction of this project, was any consideration given to time-of-use pricing?

MR. HUMPHRIES: Yes, as I recall, prior to, say, sanction and some period before there was an (inaudible) initiative, and it probably even started through our rates department, to investigate the benefits of time-of-day rates or potential benefits of time-of-day rates and those types of things.

MR. LEARMONTH: Well, was that – was anything done to –?

MR. HUMPHRIES: No, to my knowledge, nothing was done.

MR. LEARMONTH: Any reason?

MR. HUMPHRIES: I'm really not sure what the reason, but – no, I'm not sure what the reasons were.

MR. LEARMONTH: Okay.

And the last subject I want to talk about is the – well, we already know that this projected time was only up to 2057. Are you aware why consideration does not appear to have been given to the energy electrical needs of the Island, say, up until 2030 or 2031; why it had to go as far as it did?

The reason I say this is as follows: That we all know that in 2041 the Upper Churchill – the Quebec contracts for the Upper Churchill come to an end and different options open at that point. But we also know that the decision – or what's going to happen in the Upper Churchill has to be finalized well in advance of 2041 because Quebec will have to know eight or 10 years before 2041 whether they're gonna get renewal of the contract in some form.

So I'm suggesting that consideration might've been given to, you know, addressing the energy needs of the province – not up to 2057, but up to, say, 2030 or 2031 – as sort of a step process, rather than making this massive investment in – irreversible investment in Muskrat Falls.

Are you aware as to whether any consideration was given to that point?

MR. HUMPHRIES: Well, there was an alternative out there, and I think – I’m trying to be quick about – but I believe there was a sensitivity done on it, on the option of Isolated until 2041 and then Muskrat Falls. And there was a – I think there was a CPW done on that and compared to the case we’re evaluating today – it had a higher cost.

MR. LEARMONTH: But that wasn’t in the Interconnected – that wasn’t the Interconnected Option (inaudible) –?

MR. HUMPHRIES: No, no. It was done as a sensitivity.

MR. LEARMONTH: So you wouldn’t be involved in that point too much, would you?

MR. HUMPHRIES: Not a whole lot, no.

MR. LEARMONTH: No, okay.

Those are all my questions.

Thank you very much, Mr. Humphries.

MR. HUMPHRIES: Thank you.

THE COMMISSIONER: The Province of Newfoundland and Labrador?

MR. RALPH: No questions, Commissioner.

THE COMMISSIONER: The Concerned Citizens Coalition?

MR. BUDDEN: Good morning, Mr. Humphries.

MR. HUMPHRIES: Good morning.

MR. BUDDEN: My name is Geoff Budden, I’m the lawyer for the Concerned –

MS. O’BRIEN: Your mic.

THE COMMISSIONER: Mic.

MR. BUDDEN: My name is Geoff Budden, I’m the lawyer for the Concerned Citizens Coalition. And as you may know, the coalition is a group of individuals who, for a number of years, have been critics of the Muskrat Falls Project.

Have you been following the Inquiry, Mr. Humphries?

MR. HUMPHRIES: I have to say I have been, yes.

MR. BUDDEN: You have been?

MR. HUMPHRIES: Yes.

MR. BUDDEN: And in preparation for today, other than with Mr. Simmons and his associate lawyers, have you discussed your evidence with anyone else?

MR. HUMPHRIES: I did – I guess, in advance of – or in preparing I did check with the legal counsel to see if there would’ve been any issues in talking to people at Nalcor that I worked with to basically confirm some of the information, because other than the documents that are public – I’ve been retired two years; I don’t have files, I don’t have emails and all those types of things.

MR. BUDDEN: Sure.

MR. HUMPHRIES: So I did consult with Mr. Simmons, and he consulted with the board counsel to allow me to touch base with people. And I did on very few occasions, I had a couple of conversations with Mr. Moulton. That’s the only individual –

MR. BUDDEN: Sure.

MR. HUMPHRIES: – that I’ve consulted with.

MR. BUDDEN: Gotcha, and I presume –

MR. LEARMONTH: Can I just make a point?

Just in fairness, not that you’ve been unfair – but in advance of these discussions, Mr. Humphries, through his counsel had asked Commission counsel whether it was acceptable for him to discuss the letters and we said yes. So he did ask us before he did it.

MR. BUDDEN: Sure. Yeah, I wasn’t suggesting any impropriety, but it’s – where this – Mr. Humphries has been retired now since 2016, I understand.

MR. HUMPHRIES: Yes.

MR. BUDDEN: So even though you've been retired at least two years, you have made some effort to refresh yourself as to these events?

MR. HUMPHRIES: Yes, I have.

MR. BUDDEN: Okay, that's fine.

So just quickly, you were the manager of System Planning for Nalcor – I guess for Hydro then Nalcor, from 2005 to 2013, am I correct on that?

MR. HUMPHRIES: Yeah, it was – I was always a Newfoundland Hydro employee right 'til the time I retired –

MR. BUDDEN: Okay.

MR. HUMPHRIES: – even as vice president, I was the vice president of Newfoundland Hydro, not –

MR. BUDDEN: Okay, that's – so you've never drew a paycheque from Nalcor directly?

MR. HUMPHRIES: No, no.

MR. BUDDEN: Okay.

You indicated in your evidence, and I believe in your transcript and again the Grant Thornton – you sort of fairly emphatically said: Look, I'm not a load forecaster. However, you would've had a responsibility in that position to supervise the actual load forecast, or Mr. Stratton. I'm correct on that, am I?

MR. HUMPHRIES: That's correct.

MR. BUDDEN: Okay, so clearly you would have a responsibility to have a degree of knowledge in order to be able to supervise him.

MR. HUMPHRIES: That's correct, yes.

MR. BUDDEN: Okay, who did you, yourself, report to throughout the period of your being in this position?

MR. HUMPHRIES: I've moved around a bit, but during the time of sanction I reported up through the Project Execution and Technical Services division.

MR. BUDDEN: Okay.

MR. HUMPHRIES: And so from the time I took the position in 2005 'til sometime in 2010 – late 2010, my supervisor would've been John Mallam; who would've been the vice president of Project Execution and Technical Services. And from 2010 then on 'til 2013, the time I became vice president of System Operations and Planning, it would've been John MacIsaac.

MR. BUDDEN: Okay, John Manning and then John MacIsaac?

MR. HUMPHRIES: John Mallam.

MR. BUDDEN: John Manning – John Mallam, I'm sorry.

MR. HUMPHRIES: Mallam, and then John MacIsaac.

MR. BUDDEN: Gotcha, okay.

To move to another topic, as I understand it, as you and your team developed the CPW models for the analysis that had to be done, obviously you would've depended on the Nalcor project team for certain key inputs?

MR. HUMPHRIES: Yes.

MR. BUDDEN: Yes, and I'm thinking particularly the project schedule, for instance.

MR. HUMPHRIES: Well, the way the – you know, the schedule obviously mattered and the in-service dates. But the way the project – the generation source and the transmission in Labrador was modelled – it was modelled as a purchase agreement, so it – those numbers and timelines would've come to the Investment Evaluation people.

The power purchase requirements would've been – and pricing would've been developed, and that would've been our input into Strategist.

MR. BUDDEN: Sure.

MR. HUMPHRIES: So we didn't effectively, like, put the capital cost of the project into the model. We were inputting the Power Purchase Agreement.

MR. BUDDEN: Okay, and I'll get back to that in a moment, but the operating and maintenance costs obviously would've come from the project team as well?

MR. HUMPHRIES: Yes, they would have.

MR. BUDDEN: Okay, while the load forecast would've been entirely a product of your own – that input – that would've been entirely a product of your own people?

MR. HUMPHRIES: That's correct.

MR. BUDDEN: Okay.

Just so I understand, the – with – as you – if you've been following the Inquiry, you know there's been some evidence about whether the project was even, in the moment of sanction, known by the project management team to be effectively a P1 schedule. You've heard that evidence, I assume?

MR. HUMPHRIES: Yes, I have.

MR. BUDDEN: Okay, were you aware of that at the time you were doing the CPW inputs?

MR. HUMPHRIES: No, I was not.

MR. BUDDEN: Okay, what were your assumptions about the schedule?

MR. HUMPHRIES: My assumptions were that the schedule was valid, and that's what we used as an input.

MR. BUDDEN: Okay, so your input was that the project would essentially be completed for the purpose of power flowing as of July 2017?

MR. HUMPHRIES: I think it was first power in July 2017, as I recall.

MR. BUDDEN: Yes. What would be the impact on the analysis – I'm not talking down to the dollar, but just give us some sense of the general impact of the analysis if it were a P – okay, well, to put it simpler, let's say the project was operating on a 6½-year schedule, first power in July 2019, as opposed to a 4½-year schedule you thought you were operating on.

MR. HUMPHRIES: Well, there would have been an additional year-and-a-half's cost in the Isolated case that weren't there before.

MR. BUDDEN: Well, two years, I believe –

MR. HUMPHRIES: Two years, yeah, whatever. And assumedly there would – some extra cost in the – on the other side because of delay in one thing or another, but –

MR. BUDDEN: Okay.

MR. HUMPHRIES: So what the difference would be, I really don't know.

MR. BUDDEN: Okay, but clearly it would've had – even though you can't quantify it right now, hardly surprisingly, clearly it would've had an impact on the CPW analysis?

MR. HUMPHRIES: Yeah, probably more in the Isolated than the Interconnected, but that's just an off-the-cuff opinion here right now.

MR. BUDDEN: Okay, yeah.

Okay, going to ask you some questions about demand forecast, which is really the heart of what we're interested in here right here today.

And perhaps we could start with Exhibit, Madam Clerk, P-00058. That is the MHI report of October 2012. And I'm not sure if you have that in front of you or not.

MR. HUMPHRIES: It's on the screen.

MR. BUDDEN: Is it? Okay.

Perhaps, Madam Clerk, we could go to page 19, and there'll be a chart there that we'd – I'd like to have a look at.

Yeah, that's the one.

So obviously that chart looks familiar to you, I assume?

MR. HUMPHRIES: Yes.

MR. BUDDEN: Okay. And what this is, obviously, is a projection of the growth in the Island demand, and it's the projection that you

guys – the forecast that you guys used in your CPW analysis. I'm correct on that?

MR. HUMPHRIES: Yes.

MR. BUDDEN: Okay. And so this anticipated a significant growth in power-consumption forecasts for the Island of Newfoundland, I think, specifically, over that period of time, a growth of approximately 3,500 gigawatt hours. I'm correct on that, am I?

MR. HUMPHRIES: Yes, that's what the charts say.

MR. BUDDEN: Okay. And this was assuming – I believe, from the evidence of Mr. Stratton and Mr. Moulton, that this was assuming no change in the industrial growth, that the four industrial users would continue throughout this period, none dropping out, none being added. Is that – do you recall that?

MR. HUMPHRIES: Yeah, I think the only one – the Duck Pond mine closed in that period or around there –

MR. BUDDEN: Okay.

MR. HUMPHRIES: – but other than that, yes.

MR. BUDDEN: Other than that, yes.

And it also, if my understanding is correct, assumes essentially minimal population growth for Newfoundland throughout this period of time. Is that square with your understanding as well?

MR. HUMPHRIES: Yeah, it's whatever the projections of population growth were at that time.

MR. BUDDEN: And they were minimal.

MR. HUMPHRIES: They were minimal.

MR. BUDDEN: Yes.

So if we're going to – I guess my question is, generally, where will this significant, I believe, about 40 per cent growth in consumption come from over this period of time?

MR. HUMPHRIES: It's based on – it's – there is assumed to be an annual growth rate, and I think the numbers are around 1 per cent –

MR. BUDDEN: Sure.

MR. HUMPHRIES: – per year.

MR. BUDDEN: Yes, I believe 0.8 per cent. We'll get to that.

MR. HUMPHRIES: Point – yeah.

MR. BUDDEN: Yeah.

MR. HUMPHRIES: Yeah.

MR. BUDDEN: My question was a little more general, and we'll crunch the numbers in a moment, but what kind of use – if the population is static, why might it be that demand would grow 40 per cent over this period of time?

MR. HUMPHRIES: Well, there would be further – a continuation of further conversions to electric heating, that –probably the most significant.

MR. BUDDEN: Okay. So the operating assumption was that the trend towards converting to electric heating would continue into the indefinite future?

MR. HUMPHRIES: Yeah, and that's based – that was Mr. Stratton's forecast based on the data he had and the –

MR. BUDDEN: The –

MR. HUMPHRIES: – looking at history and looking forward.

MR. BUDDEN: Sure. We've heard evidence, and I'm not sure if you were – if you followed this or not, but when the MHI team were testifying, I put it to one of those witnesses that forecasting is inherently variable, and I picked up on their assertion in their report, which I can bring you to if you wish, but essentially that a reasonable performance measure for accuracy is a maximum forecast deviation of plus or minus 1 per cent a year. Does that sound familiar to you?

MR. HUMPHRIES: I have no reason to dispute it, yeah. I think it's ...

MR. BUDDEN: Pardon?

MR. HUMPHRIES: I think so, yes.

MR. BUDDEN: Okay.

So it's a given that demand forecasting – we all know, certainly by this point in the Inquiry, we all know it's not an exact science, and as with any effort to predict the future, it's inherently risky. So you wouldn't dispute that?

MR. HUMPHRIES: No, I wouldn't.

MR. BUDDEN: One does the best one can –?

MR. HUMPHRIES: Based on the information you have at hand at the time, yes.

MR. BUDDEN: Okay.

You – I presume you were aware of the significance for the larger CPW analysis of the demand forecast, how important that was as a component of the total analysis.

MR. HUMPHRIES: Well, yes, 'cause ultimately in the – could you just repeat that question again.

MR. BUDDEN: Sure. You were aware, at the time, that the demand forecast was a very significant component in the ultimate determination of which – of the CPW analysis, which in turn would lead to a determination which was the best business case for Newfoundland, which option to proceed with.

MR. HUMPHRIES: It would have a role, yes.

MR. BUDDEN: Okay, and obviously an important role, because if the demand wasn't there, that would impact –

MR. HUMPHRIES: It would have more impact on, yes, the Isolated case than the Interconnected.

MR. BUDDEN: Yes, okay.

Do you recall any discussions you had with your supervisors or perhaps with members of the project team as to the reliability of the demand forecast, the inherent risk around demand forecasting? To what degree was that on the radar, to your knowledge, of the project team? To your knowledge.

MR. HUMPHRIES: To my knowledge, yeah, it would have been on their radar. It would have been highlighted in the MHI report that the Public Utilities Board done, so there had to have been an awareness, on their part, of it.

MR. BUDDEN: Okay.

With respect to yourself as the manager of this system and presumably the point of contact between your staff – you're doing the number crunching, and your superiors are relying on that – those numbers – what role did you play in briefing your superiors of the project team about the risk of demand forecasting, the inherent variability there?

MR. HUMPHRIES: Well, I think, you know, we would have had discussions based on the outcomes of the MHI review.

We would have – after the sensitivity analysis, the load forecasts, were done at DG2, you know, that would have – there would have been some significant data there that would show that, you know, there were some significant stresses put on that forecast with the drop of 880 gigawatt hours at one time, reducing the gross rate to half of what it was there.

And even then, there was still – it didn't bring the CPW differences down to a negative difference. There was still the positive difference.

MR. BUDDEN: Sure.

MR. HUMPHRIES: And they were – these were stress cases, and that – in my view, based on what – the data that was there and the sensitivity that was done on the forecast, which was a fairly good stress case.

MR. BUDDEN: Okay.

MR. HUMPHRIES: There was still preference for the project even though it was smaller, but at the end of the day, even if these two alternatives had equal CPWs, that doesn't mean that you wouldn't –

MR. BUDDEN: Sure. (Inaudible) –

MR. HUMPHRIES: I think at best it would mean you'd be indifferent to what you did at that stage.

MR. BUDDEN: Okay. You're getting a little bit ahead of where, I guess, where my question was. My – let me put it even simpler.

Did you, yourself, brief your superior or the project team about the inherent risks of project forecasting? Do you recall such a briefing?

MR. HUMPHRIES: I don't recall a briefing as such, but I recall discussions about the forecast and the variabilities in it, but I wouldn't call it a briefing. It might have been an around-the-table discussion (inaudible).

MR. BUDDEN: Okay.

Do you recall whom you had those discussions with?

MR. HUMPHRIES: Well, it would have been senior members of the project team, so you know, Ed Martin would likely have been there and Gilbert Bennett –

MR. BUDDEN: Okay.

MR. HUMPHRIES: – and others.

MR. BUDDEN: So are you confident, as manager of this department, that you personally would have made Mr. Martin and Mr. Bennett aware of the inherent variability and risk of demand forecasting, demand – of load forecasting?

MR. HUMPHRIES: I think so, yes.

MR. BUDDEN: Okay.

So if they didn't know, it wasn't because you never told them?

MR. HUMPHRIES: I don't think so.

MR. BUDDEN: Okay. Thank you.

Perhaps we call up Exhibit 00042, Madam Clerk. That's the Navigant report.

Firstly, by way of background, we're aware, of course, that MHI and of the Navigant report. Are you aware of any other independent assessments that Nalcor would have been in possession of the – your department's load forecasting, any assessments or reviews other than MHI and Navigant?

MR. HUMPHRIES: At a couple of times, I guess, through my career, the Public Utilities Board would've commissioned a review of the hydro operations, planning techniques, load forecasting and all that, so the forecasting methodology would've been reviewed independently at those stages.

MR. BUDDEN: And again by whom?

MR. HUMPHRIES: The Public Utilities Board would have initiated it. I'm trying to think now, they had an independent consultant review it.

MR. BUDDEN: You're referring to MHI?

MR. HUMPHRIES: No.

MR. BUDDEN: Okay.

MR. HUMPHRIES: No, no, this would be back years before even this. You know, there was a review of the – our overall operations, and part of that review would have been load forecasting.

Now, these date back, they're significant years before the Lower Churchill Project and we did, after the fact, coming out of DarkNL 2014, there were a number of reviews again, but that was more looking at –

MR. BUDDEN: Liberty and so forth, yeah.

MR. HUMPHRIES: – looking at the short term more so than the long.

MR. BUDDEN: Yeah, we're thinking obviously pre-sanction here. So these earlier reports, are

we talking back in the '80s? Are we talking the early 2000s? Can you give us any –?

MR. HUMPHRIES: Yeah, the would have been in the '80s and '90s and, you know – but, at that time, it's quite likely that we were still looking at these projects, and we probably would've had 50-year forecasts on the books in some of those things because we did evaluate the Lower Churchill back in the '80s and '90s as well at the infed.

MR. BUDDEN: Okay, so you're evidence is you believe there were 50-year forecasts dating back into the '80s and '90s.

MR. HUMPHRIES: Oh, yes.

MR. BUDDEN: Okay.

All right, perhaps, Madam Clerk, we could scroll down to page 40, and when we get to page 40, we can scroll a little further perhaps and that first paragraph there. Back a tiny bit more, Madam Clerk. Up again. Yes, that first paragraph, the one that begins: Nalcor's forecast. Do you see it there, Mr. Humphries?

MR. HUMPHRIES: Yes.

MR. BUDDEN: Could you perhaps just read that into the record for us.

MR. HUMPHRIES: "Nalcor's forecast load growth in the 2010 – 2067 period is 0.8 percent. Exclusive of the impact of Vale's facility, the forecast load growth in 2010 – 2067 period is 0.7 percent. For comparison, the National Energy Board projects a 1 percent compound annual growth rate in electric energy demand for Canada as a whole from 2010 to 2020."

MR. BUDDEN: Sure. And, firstly, that's confirmation of the figure of 0.8 per cent that you and I discussed there a couple of minutes ago.

MR. HUMPHRIES: Yes.

MR. BUDDEN: So that appears to be correct.

I found it surprising, and perhaps you can – you might be able to enlighten us a bit, as we've discussed, Newfoundland throughout this period

of the next coming decades, even in 2012, minimal population growth was anticipated and yet there's an anticipated growth rate of 0.8 per cent.

Meanwhile, Canada, which as a country as a whole, I guess I would suggest to you, I don't have the figures here, but the population of Canada is in fact not static, but is in fact growing; significantly growing. Would that appear to be correct to you?

MR. HUMPHRIES: Yes.

MR. BUDDEN: Okay. Yet the growth, projected growth for Canada is not a whole lot higher, 1 per cent.

Can you enlighten us, I guess, on why Newfoundland, even though its population is not growing, compared to Canada as a whole, nevertheless its demand is growing at almost the same rate?

MR. HUMPHRIES: Well, again, Mr. Stratton, I don't know if you questioned him on that, I don't – but some of the fact is, is we spoke about earlier, conversions from other heating sources to electricity, and also the electric grid in Newfoundland is relatively young, compared to the rest of Canada and North America, and the penetration of things like dishwashers, more televisions, there's – we haven't saturated on a lot of those things, yet.

People are still continuing, and with the move, with the population shift from rural to urban areas, it's – you get, you know, there's an uptake in those types of devices: electric hot water heaters that – where they've probably saturated in other jurisdictions, there's still a segment of the load base out there that's yet to convert and probably forecast. And I think that would've impacted somewhat of the additional growth, besides the electric heat.

MR. BUDDEN: Okay, but you believe electric heat was the major –

MR. HUMPHRIES: The biggest part of it –

MR. BUDDEN: – (inaudible) of growth.

MR. HUMPHRIES: – yes.

MR. BUDDEN: Okay.

MR. HUMPHRIES: Yeah, conversion.

MR. BUDDEN: The – a couple of questions now about demand elasticity, which we've talked about with various witnesses and which you obviously understand the significance of.

It was – it's common ground, I don't think anybody disputes that whatever scenario is used, Isolated or Interconnected, that the power rates for consumers are going up significantly in the years to come. That's unavoidable, isn't it? That's my understanding.

MR. HUMPHRIES: That's right.

MR. BUDDEN: Okay. And, presumably, that significant growth would have an impact on demand in the sense that to the degree that demand is elastic, one would have presumed that increase in price would cause people to use less electricity where they can.

MR. HUMPHRIES: I think that's the general assumption, but –

MR. BUDDEN: Okay, and one you would accept.

MR. HUMPHRIES: Generally, yes.

MR. BUDDEN: Okay.

To what degree, I guess, did Nalcor attempt to quantify the impact that would have? And I'm thinking here of your own internal research. Again, we've had some discussions with Mr. Stratton on this, but perhaps even more importantly, are you aware of any attempts to retain specialist consultants to determine the impact that demand elasticity would have on forecasting, on the load forecast?

MR. HUMPHRIES: I'm not aware, I do know Mr. Stratton had done a fair bit of research on it and I think, as he would have testified, that, you know, the whole question of how much elasticity was there at that – there was a certain degree of inelasticity in its calculations. But, no, I'm not aware of anything further than that.

MR. BUDDEN: Okay.

MR. HUMPHRIES: And we're getting into the area now that's deeper than my –

MR. BUDDEN: Sure.

MR. HUMPHRIES: – level of understanding.

MR. BUDDEN: Because that's a pretty specialized topic isn't it, the determination of demand elasticity?

MR. HUMPHRIES: I think so, yes.

MR. BUDDEN: Okay.

So, it would require, presumably, specialized skills to make such a determination.

MR. HUMPHRIES: Yes.

MR. BUDDEN: Okay.

Was it was your belief that your team possessed those skills, or did you believe that was something that required greater specialization than anybody on your team had?

MR. HUMPHRIES: No, well, you know, you have to look back, I think, to the evolution of the team as well. That initially in the economic analysis section, which later became market evaluation, or market analysis, Mr. Steve Goudie was also a – he was Paul Stratton's mentor and director when he first started, so he was well versed and had a well-rounded background in those areas as well, and he basically trained Mr. Stratton. And up 'til 2012, even though Mr. Stratton didn't report to Mr. Goudie anymore, Mr. Goudie was in the company and they consulted quite frequently and compared notes and those types of things.

MR. BUDDEN: And to your knowledge, did Mr. Goudie have specialized skills with respect to demand forecasting?

MR. HUMPHRIES: I'm really not sure what his actual training was.

MR. BUDDEN: Okay.

MR. HUMPHRIES: Like I say, Mr. Goudie only worked for me for a very short time. And the whole economic analysis and load

forecasting division was not a part – always a part of system planning. That came into system planning sometime in the, I would say, late '90s, early 2000s.

MR. BUDDEN: Okay, so by the time we get to sanction, it had been within the – your system planning for 15 years or so.

MR. HUMPHRIES: Yeah, 12 to 15 years.

MR. BUDDEN: Sure. You'd been manager of that system for –

MR. HUMPHRIES: For –

MR. BUDDEN: – five, six, seven years?

MR. HUMPHRIES: Six, seven years, yeah.

MR. BUDDEN: Okay, and I guess my question is, to your knowledge, did anybody within your division, on your team, have any specialized knowledge or training with regard to demand elasticity?

MR. HUMPHRIES: Whether they had specialized training – I cannot say one way or the other what they – I don't know.

MR. BUDDEN: Okay, sure. Perhaps we can go to Exhibit 00076, Madam Clerk. What this is – I'm using this as a way of getting to the continuing discussing of demand forecast. This is a presentation that the present CEO of Nalcor, Mr. Stan Marshall, gave in 2017. And perhaps we could go to page 25 of that, Madam Clerk?

And what he's talking about here, and perhaps I'll skim through it to save time. Mr. Marshall at this point is talking about load forecasting and he says: "look: I understand this; it's the real world. But, you have to understand me, too." I'm interested in all this came about. And then he skips a bit, and he goes down: "'How much energy do you really need?' So, people are doing studies for 40 or 50 years. Can you imagine? I can't predict what the energy load is going to be two years from now, but, you've got to assume something. Well, they assumed something; the assumptions were reasonable, but, you know what? You dropped about 80 terawatt hours."

Firstly, that reference to: "You dropped about 80 terawatt hours." Can you explain that? Do you understand that?

MR. HUMPHRIES: I don't know what that is.

MR. BUDDEN: Okay. Well, let's – we'll get to that in a moment. Let's continue down a bit.

And down in the next paragraph he's referring to a chart that we don't have as an exhibit, but I can speak to in a moment. He's saying: "This light blue" – he's talking about a line – "is what Hydro initially thought it wanted to serve the island, but, because of that load drop in load, we now have to sell in the open market."

So he's talking now, in 2017, about a load drop. You were there until 2016. What is your understanding of the load forecast – the drop in the load forecast that was delivered during this time, 2016, 2017?

MR. HUMPHRIES: Well, the longer term forecast, yes, did reflect a decrease. The shorter term forecast, we were into increases.

MR. BUDDEN: Very short term.

MR. HUMPHRIES: Well, five year – five, 10 years.

MR. BUDDEN: Okay, but if we took it out to 2040 –

MR. HUMPHRIES: Yeah, well, based on the indicators of the day, I guess, the economic indicators that Mr. Stratton would use in his – yeah, they were obviously lower than they were in 2012, so that would result in an overall lower forecast.

MR. BUDDEN: Yes, and my suggestion to you – it was quite a substantial drop. I believe the original – the difference between the original forecast and the revised forecast of 2017, taking us up to about 2040, was quite a substantial drop. You're familiar with that?

MR. HUMPHRIES: No, I'm not, because the 2017 forecast would have been done a year after I retired, and I don't think even the 2016 forecast had been finalized at the time I retired.

MR. BUDDEN: Okay.

Would you be surprised to know that the growth in demand for the period of 2017 to 2040, as of 2017, was forecast to be about 0.2 terawatt hours or about 200 gigawatt hours over that period of time?

MR. HUMPHRIES: I'm not aware of what the forecast – surprised? I don't know if I'm surprised or not. I'd need to sit –

MR. BUDDEN: Okay.

MR. HUMPHRIES: – down and analyze and look at what the drivers were, and it's – again, we're at a point in time when the economy is depressed and all those things, so I really don't know. I'd have to –

MR. BUDDEN: Sure. Okay, well for my next handful of questions just assume that to be true. If it's not true, then –

MR. HUMPHRIES: Yeah.

MR. BUDDEN: – your answers won't be relevant to us, but I would suggest that we can assume they're true, so that translates to quite flat growth over that period of time. We're talking about an increase of only 200 gigawatt hours over a 23-year period. That's pretty flat, isn't it?

MR. HUMPHRIES: Yes, it is.

MR. BUDDEN: Okay, my understanding is it's actually about 0.1 per cent growth per year. Does that sound about right to you?

MR. HUMPHRIES: Yes, yeah, probably. I guess, based on those numbers, yes.

MR. BUDDEN: Okay, so the – in 2012, the forecast was for 0.8 per cent growth; by 2017, it was down to 0.1 per cent growth if my – what I'm telling is correct, so that's obviously quite a dramatic, substantial drop, isn't it?

MR. HUMPHRIES: It is.

MR. BUDDEN: Okay.

Perhaps we could go to Exhibit P-00049, which is the January 2012 MHI report, and Madam Clerk, if we can go to page 209 of that exhibit.

That chart there, which is labeled, perhaps – yeah – CPW Sensitivity Analysis Summary, are you familiar with this chart, Mr. Humphries? Take a moment, if you need it.

MR. HUMPHRIES: Can you just page down a little.

Yes.

MR. BUDDEN: Okay.

My understanding is that this is a summary of the sensitivities which your team performed at DG2. Is that correct?

MR. HUMPHRIES: Not all of these, as we got into earlier, would've been performed by my team, but yes, I would've been aware that they were done.

MR. BUDDEN: Sure.

MR. HUMPHRIES: Yes.

MR. BUDDEN: Okay.

And some of it was built on information provided by other people, but essentially, we've established what it was.

MR. HUMPHRIES: Yeah.

MR. BUDDEN: Was a similar document prepared or similar sensitivities run at DG3 to your knowledge?

MR. HUMPHRIES: To my knowledge, not all of them, I don't think they were – to my knowledge, now, there were no sensitivities run on the load forecasts –

MR. BUDDEN: Okay.

MR. HUMPHRIES: – since the changes in DG3.

MR. BUDDEN: Okay.

Well, let's look at line 2. Perhaps you can just tell us what line 2 is, just – and walk it across for us.

MR. HUMPHRIES: Yeah, well, that was a annual load decrease of 888 hours, so that's a sudden loss or reduction in load of 888 gigawatt hours, and it was intended to represent the loss of a industrial load –

MR. BUDDEN: Okay.

MR. HUMPHRIES: – at the time.

MR. BUDDEN: Okay.

And the loss of 880 gigawatt hours from the load forecast, that's what it is, right?

MR. HUMPHRIES: Yes.

MR. BUDDEN: Okay, and the impact of that, what does that do to the comparison of the Isolated Island Option, the Infeed Option?

MR. HUMPHRIES: Well, they – the spread reduces – the difference's now only \$408 million as opposed to the 2.1 or \$2.2 billion that was there before.

MR. BUDDEN: Okay.

While not exact, I would suggest to you that's fairly approximate as the difference would be between the 0.8 per cent load forecast and the 0.1 per cent load forecast, between the 2012 and 2017 forecast.

Does that sound about right to you?

MR. HUMPHRIES: I don't know, my math's not that good, but maybe.

MR. BUDDEN: It's probably better than mine, but ...

MR. HUMPHRIES: Yeah, okay, if you say – I can't disagree with you, and I can't necessarily agree, but (inaudible) –

MR. BUDDEN: Okay, but assuming it's correct, then it would follow, I would suggest, that if your team in 2012 were working from the

2017 numbers, the CPW analysis would've resulted somewhere around \$408 million.

MR. HUMPHRIES: But we weren't.

MR. BUDDEN: You weren't, of course, but if you were.

MR. HUMPHRIES: No, we weren't. We were working –

MR. BUDDEN: Yes.

MR. HUMPHRIES: – with what we had at the time, and the information that was available to us at the time, and this was a fairly sensitive sensitivity on that, fairly large, and that's what we did.

MR. BUDDEN: And even five years out it was –

MR. HUMPHRIES: Yeah, but another five years out we could be back in a – the economy's recovered and we're back in a growth scenario.

MR. BUDDEN: Okay. But this is, of course, a projection into the future which presumably isn't overly influenced by whatever moment in the cycle you happen to be in at the time.

MR. HUMPHRIES: Well, it is based on the projections that you see and that's based on what's currently going on in the province. And, you know, in 2012 the province – 2010, 2012 the province was doing relatively well. And the load projections were based on the projections that we got. We didn't make up the projections, they came from other people that look at what the economic outlook was.

Yes, there were changes and they can change again.

MR. BUDDEN: Of course, it did assume – you took information from other people. We've heard from Mr. Stratton on that, and I suggest to Mr. Stratton that the sources that he choose from were sources that tended to reflect an economy doing better than – other than the meta-sources were suggesting.

MR. HUMPHRIES: I'm not aware, I'm not – I really can't comment on that because I don't know.

MR. BUDDEN: You weren't into the weeds to that degree.

MR. HUMPHRIES: No.

MR. BUDDEN: Okay.

But just on that final point, I mean, surely you would acknowledge that the purpose of a load forecast is not to just project out from the moment in the economic cycle you happen to be in, it's much more complex than that.

MR. HUMPHRIES: It is but you have to use – it's done based on a base assumption of inputs and the inputs that were put in were assessed to be valid at that point in time. Everything changes, and, yes, we can do this analysis now and you could've said these numbers were like this back in 2012. Yes, we would've had these smaller CPW differences and, yes, we would've probably scrutinized it a lot more. But based on what we had and what we did, on the information we had, we – to the best of our ability – projected what we thought it was going to look like. And that's what we had in 2012.

MR. BUDDEN: But the point remains, I would suggest to you, that even a difference of five years, which is not a great length of time, can cause variation in what a – way over \$1 billion, \$1.5 billion in CPW analysis.

MR. HUMPHRIES: Yes, and a further five years could turn that around.

MR. BUDDEN: Okay.

Let's go to line 10. Could you scroll down just a tiny bit more?

What this is, if I understand correctly, is the – taking the assumption we just discussed in line 2, a decrease in load and an increase of 10 per cent in the capital cost, and if I understand that correctly, at that point the difference between the two options is reduced to virtually nil.

MR. HUMPHRIES: That's correct.

MR. BUDDEN: Okay. So that's all it takes: a little twig of a forecast and a little twig of the capital cost?

MR. HUMPHRIES: Well, it's more than a little twig; 880 gigawatt hours was a significant twig of the forecast.

MR. BUDDEN: Okay.

MR. HUMPHRIES: And that's not like a gradual decrease, that was plucked out right at – right from the beginning. And the capital cost, well that's 10 per cent, I really – how significant that is.

You know, hindsight is always 20/20 when you – but that was deemed to be a reasonable – and not by me, it was deemed by the people that determine what the sensitivities were going to look at.

MR. BUDDEN: Sure.

I've got another five or maybe 10 minutes. What would you want me to do?

THE COMMISSIONER: Well, it's up to you, if you'd like to finish, we can finish. If you want to come back at 2 o'clock, we'll come back at 2 o'clock.

MR. BUDDEN: Perhaps we'll come back at 2.

THE COMMISSIONER: Okay.

Let's start at 2 o'clock sharp then, and we'll go from there. So we'll adjourn 'til 2.

CLERK: All rise.

Recess

CLERK: All rise.

Please be seated.

THE COMMISSIONER: Okay, Mr. Budden.

MR. BUDDEN: Yes.

Mr. Humphries, I – so let's assume that your forecast – 2012 forecast is correct – which was obviously the assumption that was made at the

time of sanction, and Newfoundland really will require all the energy that was anticipated at that time, so we'll go back to that assumption – will we still, under that scenario, be able to meet – will Nalcor be able to meet its obligations to Emera under the Energy Access Agreement? Is there still going to be sufficient power?

MR. HUMPHRIES: Yes, I believe there will be.

MR. BUDDEN: Okay. Do you recall testifying before the Nova Scotia UARB? I believe it was 2013.

MR. HUMPHRIES: Yes, I do.

MR. BUDDEN: Okay.

Do you recall saying, at that time, something – and it's not your exact words but something to the effect that: If Nalcor did require more power to meet its obligations under the EAA, the Energy Access Agreement, then it would construct further generating capacity. Do you recall saying something to that effect?

MR. HUMPHRIES: Yes, to that effect. I think, within the agreement there is a clause that if it becomes that Nalcor could not deliver, that Emera and Nalcor would go – look jointly at what the options would be to rectify the shortfalls. And that could be – end up Nalcor building something else, but the likelihood of that is fairly low.

MR. BUDDEN: The –

MR. HUMPHRIES: The likelihood of that happening would be, in my opinion, very low.

MR. BUDDEN: Okay and what do you found that opinion on?

MR. HUMPHRIES: Well, based on that's – provided that the hydrological sequence for the province continues along the lines that it has for the past 60 years, there should be no issue in providing that energy. So something would have to change with the level of inflows, and we would see a new firm energy that would be lower than what we're predicting now to –

MR. BUDDEN: Okay.

MR. HUMPHRIES: – get to the situation where we couldn't provide the excess energy on the Energy Access Agreement.

MR. BUDDEN: Do those assumptions rely at all on the power that might be available in 2041, or the independent of that?

MR. HUMPHRIES: Independent of that.

MR. BUDDEN: Totally independent of that?

MR. HUMPHRIES: Yes.

MR. BUDDEN: Okay.

So when I said a moment ago that – or my question a moment ago: Are we still able to meet our obligations to Emera under the EAA, assuming that the demand forecast of 2012 proves accurate, you hesitated but you said, yes. Is that the basis of your hesitation, the – trying to meet these obligations?

MR. HUMPHRIES: No, the hesitation was probably just thinking –

MR. BUDDEN: Okay.

MR. HUMPHRIES: – it through in my head.

MR. BUDDEN: Okay.

I'd like to take you to your transcript, and there's a couple of quotes in there that I just want to put to you for confirmation and then ask you a question or two about them.

And the first one, you speak – reading your transcript, you speak very succinctly and very strongly – you have an opinion, you certainly express it, and I'm thinking that's far from a criticism, it's good to see.

I'm reading now your transcript, page 37, for anyone who is following. And you're talking about DarkNL, which comes a little after this, but it's a starting point of some quotes I'm putting to you.

You said: We went 40, 50 years and, yeah, you would have your problems, but you always rode through them. You never got to the stage where you run out of generation. But on January 2,

2014, we ran out of generation. We didn't have enough, there was no gas left in the tank. And I mean that was a cardinal sin. It just – so I mean, it was like taking a knife and driving it through my heart.

Do you remember saying that?

MR. HUMPHRIES: Yes, I do.

MR. BUDDEN: Okay, so DarkNL had that profound an impact on you?

MR. HUMPHRIES: It did. Yes, it did.

MR. BUDDEN: Okay and why was that again?

MR. HUMPHRIES: Well, because that's – it's one thing you strive not to do, and particularly as a planner, to run short of resource. Now, granted, there was a number of complicating issues that went on during DarkNL, but it did happen and it was a wake-up call just to remind you that it can happen.

MR. BUDDEN: That we're on an Island.

MR. HUMPHRIES: That's right.

MR. BUDDEN: Off grid.

MR. HUMPHRIES: Off grid.

MR. BUDDEN: So if you're the manager of systems planning in Manitoba or Saskatchewan or Milwaukee or somewhere, you don't have those concerns.

MR. HUMPHRIES: No, you know that you got options to cover the load if you get in that situation. You got neighbours, you go interconnections; you can, in all probabilities, get out and if you hadn't already got those arrangements in place, very quickly make arrangements to get emergency supply and keep the lights on.

MR. BUDDEN: Sure.

And another place you said: If we were interconnected, we would never see people in the dark either, we'd do what we could.

MR. HUMPHRIES: That's right.

MR. BUDDEN: Yeah, so that's sort of the understanding.

MR. HUMPHRIES: That's how interconnected utilities work.

MR. BUDDEN: Okay.

MR. HUMPHRIES: They help each other out, yes.

MR. BUDDEN: Though we are not interconnected, we are isolated.

MR. HUMPHRIES: That is correct.

MR. BUDDEN: And this fear, I guess, the fear that was realized on January 2, 2014, that wasn't a new fear for you, was it, (inaudible).

MR. HUMPHRIES: No, it's always there.

MR. BUDDEN: It's always there.

MR. HUMPHRIES: Always there.

MR. BUDDEN: And have been for years.

MR. HUMPHRIES: As long as I've been at the –

MR. BUDDEN: Okay.

MR. HUMPHRIES: – at it, yes.

MR. BUDDEN: There's a few more quotes from page 28. And you and Ms. O'Brien have – she's put a question to you and I'm not really interested in the question, it's your answer that I think is important.

You say: And, like, if you go that far, like, to get to 2041 – very doubtful if you can get to 2041 without having to replace the units at Holyrood. Once you do that and then you look at that sum cost that – what are you gonna do with them – with that then in 2041? Are you gonna shut it all down and then spill – spend I don't know how many billions of dollars to build the Infeed? What's the, you know – are you – are you committing yourself by doing that? Are you committing yourself forever to an Isolated Island, day by day? Do you remember saying that?

MR. HUMPHRIES: Yes.

MR. BUDDEN: Okay. And then you said – and Ms. O'Brien asked: Do you believe you would be? And you said: I don't know, but I do know we would be committing ourselves to a future that, from an electrical perspective that we're still in the 20th century. We haven't come into the 21st century. The Interconnection brings us on a par with the rest of the world or North America. We will never get there on an isolated case.

That was your belief then?

MR. HUMPHRIES: Yes.

MR. BUDDEN: It had been your belief for years.

MR. HUMPHRIES: A long time.

MR. BUDDEN: And it is your belief now?

MR. HUMPHRIES: Yes, it is.

MR. BUDDEN: Okay.

And in a similar vein, the previous page, page 27, Ms. O'Brien is putting to you about the Isolated Island Option – quote: Has more flexibility in it to respond to changes in the future than does the Interconnected Island. Do you agree with that? And you say: I personally, I think, there's a lot more flexibilities in the Interconnected case. Ms. O'Brien says: Okay, so why? And you say: Well, it's because of the interconnection and the reliability it brings, and the ability to do other things.

So, as I take it, you're saying there that there – in your mind, there's a real reliability difference between the Interconnected versus the Island – the Isolated?

MR. HUMPHRIES: Yes, I am saying that, yes.

MR. BUDDEN: Okay. And then you – the last quote I really have in this sequence, you say in the previous page – again talking about being isolated – you say: One-third of the time you run the risk of getting caught and running out of power and you do not want to run out of power. We did it once in the 60 years we've been

operating – once – and we'd been paying the price of that for the rest of our lives; what happened in 2014.

So, I take it from that, that you, again, see this as an ever-present concern for an isolated system?

MR. HUMPHRIES: It is.

MR. BUDDEN: Running out of power?

MR. HUMPHRIES: Yes, it is.

MR. BUDDEN: Okay.

And finally, on page 15 you say: You can't make the Isolated system as reliable because it has to get bigger to be more reliable and, you know, you just can't do it.

So that is your view of the Isolated Island system. It just can't be made reliable?

MR. HUMPHRIES: Yeah. And that's based on 30-plus years of working with an understanding how it works, how it reacts, what its capabilities and limitations are.

MR. BUDDEN: Sure. And that's your honest belief? Your testifying and you clearly – it's a heartfelt belief?

MR. HUMPHRIES: It is.

MR. BUDDEN: Okay.

I guess what I'm asking you, you undertook this analysis or had your team do so, this comparative analysis of, you know, CPW and all the factors that went into it. To what degree did your heartfelt belief that the Isolated Island Option was not the way to go forward? How did that influence how you undertook that analysis?

MR. HUMPHRIES: I don't think it affected it at all.

MR. BUDDEN: You really don't think –

MR. HUMPHRIES: I really don't. I think we did a fair evaluation of the alternatives that were there.

MR. BUDDEN: Okay. Despite the fact that you yourself essentially already had your mind made up.

MR. HUMPHRIES: Well, it – the interconnection has been a vision for a long time and I – you can date back – I read some information on the weekend back in the early '60s when the Bay d'Espoir development was being built and it was envisioned then as the way to go at that time.

So, yeah, I believe that, but, no, its not at all costs and I do believe, based on the mandate I had as manager of system planning, we did give it a rigorous evaluation and we did a rigorous screening of the alternatives. And the things that were eliminated, were eliminated for reasons.

MR. BUDDEN: Okay.

And when it came to comparing the cost for the two options, are you saying that any weaknesses in that analysis, perhaps any problems you had with the demand forecasting, the problems with projecting the price of oil, anything like that, was not because you secretly were, you know, putting your thumb on the scale but because of just problems inherent to forecasting.

MR. HUMPHRIES: Most definitely.

MR. BUDDEN: Okay.

Thank you.

MR. HUMPHRIES: Thank you.

THE COMMISSIONER: All right, Edmund Martin?

MR. SMITH: No questions, Mr. Chair.

THE COMMISSIONER: Okay.

I don't believe Kathy Dunderdale is here.

Provincial Government Officials 03-15?

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: Consumer Advocate?

MR. PEDDIGREW: Good afternoon, Mr. Humphries.

MR. HUMPHRIES: Good afternoon.

MR. PEDDIGREW: My name is Chris Peddigrew and I am legal counsel for the Consumer Advocate, so for the ratepayers of the province. So I do have some questions for you today.

Just a few questions around your background and, I guess, what you're currently doing as well. So you retired about two years ago you said.

MR. HUMPHRIES: Yeah, that's correct.

MR. PEDDIGREW: Okay. And so since then, have you worked at all or you been completely retired?

MR. HUMPHRIES: Completely retired and enjoying it.

MR. PEDDIGREW: Okay. So no work at all for Hydro or Nalcor since then.

MR. HUMPHRIES: No.

MR. PEDDIGREW: Okay.

(Inaudible) some questions about your background. So you graduated in 1982. Since that time, did you do any training throughout your career to upgrade your credentials?

MR. HUMPHRIES: No academic or university-type updating. But I did do a fair amount of training in my early days, in short courses in our system planning techniques, which was a course that gives a general overview of the whole system planning facet,

which would include generation, transmission, load – a small section on load forecast. I would have done courses in power system analysis, that's the modelling of the power system, load flow, stability, fault levels – several courses in that over the years.

MR. PEDDIGREW: Okay. And when would these courses have been done?

MR. HUMPHRIES: Most of these would have been in the '80s and early '90s. I've done several courses in HVDC technology and the integration of that into systems.

MR. PEDDIGREW: Same time frame or more recently?

MR. HUMPHRIES: Yeah, they might've gone up into the – might have done – I've done several of those. I'd say it was still, though, the late '90s, early 2000s.

MR. PEDDIGREW: Okay. And anything since then?

MR. HUMPHRIES: No.

MR. PEDDIGREW: And what about other people on your team? Was there any sort of requirements within Hydro for on-going education or upgrading of credentials?

MR. HUMPHRIES: There was no formal requirement, but pretty well all of the engineers that I had working under me had MBA degrees as well, that they went and pursued of their own accord, that obviously was a benefit to the work they were doing.

I had one individual in particular who I would classify as a subject-matter expert in our system analysis and I would stack up against anybody in this country, (inaudible.)

MR. PEDDIGREW: Who would that be?

MR. HUMPHRIES: Mr. Peter Thomas.

MR. PEDDIGREW: Peter?

MR. HUMPHRIES: Thomas.

MR. PEDDIGREW: Thomas, okay.

MR. HUMPHRIES: He has knowledge and abilities to be able to conduct – and his power system analysis and understand and interpret the results. He is something – he is an expert.

MR. PEDDIGREW: And what was his position?

MR. HUMPHRIES: He was – well, he was a senior transmission planning engineer that ultimately became manager of transmission planning, I guess, post – once I became vice president, there was a little bit of a reorganization and we introduced a management level in the planning at both generation and transmission. Peter was in that role, and then he moved over – actually moved to the Lower Churchill team to deal with integration work there; integration issues related to the integration of the project, and he just recently retired.

MR. PEDDIGREW: And do you know around when did he move to the project team from Hydro?

MR. HUMPHRIES: It was before I retired. I would say probably 2015 – late 2014, early 2015.

MR. PEDDIGREW: So after sanction?

MR. HUMPHRIES: Oh, it was after sanction, yes.

MR. PEDDIGREW: Okay, all right.

MR. HUMPHRIES: He was in System Planning all through the sanction process.

MR. PEDDIGREW: Right, okay.

And so just getting back for a moment to – there was no formal requirements within Hydro for training on – I guess what I'm wondering is any specific training on issues like wind, power generation or conservation demand management?

MR. HUMPHRIES: I don't think there were formal requirements. Now, that's not – you know, they would've been – we had a keen interest in wind from a long time back, you know. We started back in the early 2000s with the wind issue and if there were seminars or

courses being offered somewhere, we probably – we took some in. I don't know if I personally took them in, but I know some of the staff would've taken them in to get a feel for, you know, or a better understanding of what was going on in the industry, and to understand how many people were in the same situation, or in similar situations to us within an isolated grid and were experiencing similar issues we were.

MR. PEDDIGREW: Okay.

And so who would be in a similar situation in an isolated grid? I think Hawaii was mentioned here today.

MR. HUMPHRIES: Hawaii, yeah.

MR. PEDDIGREW: Anybody else?

MR. HUMPHRIES: There's not a whole much more – whole lot more, and – that the issues related to operating these generation – types of generation on an isolated system are lost on a lot of people. They just don't understand it, they never – they can't imagine that something so small could have such a big effect on the system.

MR. PEDDIGREW: So some unique issues?

MR. HUMPHRIES: Unique, yeah. There's a lot of unique issues on this Isolated system.

MR. PEDDIGREW: During your interview, in the interview transcript there was some discussion or some questions that were put to you by Ms. O'Brien about the Lower Churchill Executive Committee. I think you said you were a member of that committee. Is that correct?

MR. HUMPHRIES: Yes, I was.

MR. PEDDIGREW: And I think you made some reference to the fact that the committee didn't ultimately, I guess, in your view, fulfill its intended purpose or didn't meet as often. I just wanted to ask you a little bit about that. So what was your understanding of the purpose of the Lower Churchill Executive Committee?

MR. HUMPHRIES: Well, I think initially, as it set out, that my understanding was that this would be a high-level Oversight Committee and that would be kept informed of issues that were

going on with the project – with the integration of the project and things like that. And that if issues of significance arose, that they would be elevated or could be elevated to that committee for a resolution. I don't recall ever getting to the stage where an issue came up for ...

MR. PEDDIGREW: How often did you meet, do you know?

MR. HUMPHRIES: I think the intent was to meet monthly. It didn't always happen monthly and there was not great attendance then when it did happen.

MR. PEDDIGREW: When you say not great attendance, what do you mean? People who were on the committee would not show up?

MR. HUMPHRIES: Yeah.

MR. PEDDIGREW: Okay. And do you recall anybody in particular that had a poor attendance record?

MR. HUMPHRIES: There were a lot.

MR. PEDDIGREW: Pardon me?

MR. HUMPHRIES: There were a lot that had poor attendance, you know.

MR. PEDDIGREW: Okay, who might they be?

MR. HUMPHRIES: Well, people from the project, might've been Mr. Bennett or it might've been Derrick Sturge, the CFO.

You know, I think if there were records of attendance shown, I'd probably – other than the person chairing it, I probably had close to the best attendance.

MR. PEDDIGREW: You figure you had close to the best attendance?

MR. HUMPHRIES: Close.

MR. PEDDIGREW: Okay.

MR. HUMPHRIES: Yeah, there's not many that I missed that ...

MR. PEDDIGREW: And so, would it be fair to say that members of the project team generally had poor attendance at these Lower Churchill Executive –

MR. HUMPHRIES: There was always –

MR. PEDDIGREW: – Committee meetings?

MR. HUMPHRIES: There would generally always be somebody there from the project team. And, you know, like, if there were – and the meetings generally started with an update of what's going on in the field now and, you know, information, good process for transfer of information.

You know, I learned a lot about what was going on in the project from these meetings, but as from the perspective of that, you know, that this was some kind of higher court that things were going to be resolved and that, didn't – there was – that didn't happen (inaudible).

MR. PEDDIGREW: Okay.

So I guess the outcome or the committee didn't meet what you had initially expected it would –

MR. HUMPHRIES: Well, yeah, not what I thought it was intended to be.

MR. PEDDIGREW: All right.

And what about the Muskrat Falls integration committee? What was your understanding of the purpose of that committee?

MR. HUMPHRIES: Well, that was a committee to look at unique issues relating to the integration of the new assets into the old assets. That was more of a technical-based committee that would get into the – down into the weeds of the types of the things, the problems that were there and work their way through it.

MR. PEDDIGREW: And you were on that committee as well?

MR. HUMPHRIES: I was on it, but I wasn't as active as some of the – my staff, Mr. Thomas, as I referred to, who got in and that was living and

breathing all these issues every day as his daily tasks, right?

MR. PEDDIGREW: Anybody else from your staff besides Mr. Thomas?

MR. HUMPHRIES: Yeah, there probably would've – Mr. Thomas would've been a regular. Some of the others – some of the other transmission planning engineers could've been drawn in from time to time but – and, as well, people from System Operations at the time, because I think that committee really got – started to pick up speed after the time I became vice-president and also had responsibility for System Operations. So the manager at the control centre, in charge of the control centre, the operations of the system, he would have been involved with them as well.

MR. PEDDIGREW: And you say when that committee really started to pick up speed, when would that have been around? Around 2013?

MR. HUMPHRIES: Yeah 2013.

MR. PEDDIGREW: Okay.

MR. HUMPHRIES: And I – things are coming to mind now as we're talking but, yeah, it was around 2013. And the intent of my role, when I became vice-president, was to sort of lead all these integration-type issues. I was appointed vice-president in April of 2013 and in January 2014 DarkNL happened. And I was consumed for the rest of my career with DarkNL and I didn't – the work of that committee was going on, but I had minimal involvement and –

MR. PEDDIGREW: So who would have been overseeing in your place if you were –?

MR. HUMPHRIES: Well, I think Mr. Thomas and Mr. Butler who was the manager of System Operations would have been operating that themselves, right?

MR. PEDDIGREW: And were there members of the project team on that committee as well?

MR. HUMPHRIES: Yes, there would have been project ...

MR. PEDDIGREW: Do you recall who?

MR. HUMPHRIES: Off the top of my head I do not recall, but probably Mr. Raj Kaushik and a few others that were over there that were dealing with the electrical-type issues.

MR. PEDDIGREW: Okay.

MR. HUMPHRIES: But I'm not positive on that, I don't fully recall.

MR. PEDDIGREW: Okay.

Just a question, Mr. Humphries, about Gull Island and I know you're you've been – you were with Hydro your entire career, so from the early 1980s. And we've heard other evidence about some of the, I guess, plans to develop Gull Island that were considered over the years.

Do you know – during your time, was there ever a plan that any Gull Island power would be used for on-Island or was it always a case of exporting Gull Island power?

MR. HUMPHRIES: No, it wasn't always the case. If you go back through most of the Hydro-Québec scenarios that would have had either Gull Island developed, or Gull Island and Muskrat Falls as well, there was always – the Island would have been supplied from whatever was developed and the extra exported. So if it were – there would have been scenarios where there was a Gull Island only and you would have had your 800-megawatt Infeed to the Island and the balance would be available for export.

MR. PEDDIGREW: Okay.

So your understanding is that under all those scenarios there was – the plan was to bring power to the Island from whichever, Lower Churchill –

MR. HUMPHRIES: Whichever. Yeah, I'm not aware of one that didn't involve some kind of connection to the Island.

MR. PEDDIGREW: Mr. Humphries, some of the questions this morning – Mr. Budden asked you a few questions about rates, I guess impacts on rates. I guess one of my – I represent the ratepayers, obviously, so very concerned about potential increase in rates resulting from Muskrat Falls. And some of the sensitivities that

were run – was there ever a sensitivity or were there sensitivity analysis run whereby the actual rate that ratepayers would pay was calculated? Was that anything that was done by Investment Evaluation or anybody else?

MR. HUMPHRIES: I'm not sure.

MR. PEDDIGREW: Okay, do you know who would know the answer to that question?

MR. HUMPHRIES: Yeah, Mr. Sturge should know, or the rates people that work under him.

MR. PEDDIGREW: Who would that be?

MR. HUMPHRIES: I can't remember now. I'm not sure who's – there's been a lot of change since I left, you know. I know at one point it was Glenn Mitchell, but Glenn is long retired. I can't recall who's in that role right now.

MR. PEDDIGREW: Okay. But you're not aware, I guess, through your position and what – I guess, the parts you were involved in. You're not aware that – or you didn't see any calculations –

MR. HUMPHRIES: I'm not aware –

MR. PEDDIGREW: – of what those rates would be?

MR. HUMPHRIES: – but that doesn't mean it wasn't done either.

MR. PEDDIGREW: Okay.

Was it discussed? Do you know if it was discussed during – either in lead up to DG2 or DG3, what the (inaudible) would be?

MR. HUMPHRIES: Well, yeah, you know, I think, you know, in the whole history of Hydro, as you go through at the end of the day what the rates will be and the impact on rates was a significant concern and it would've got addressed. Actual discussions on – relating at DG2 or DG3, I don't recall –

MR. PEDDIGREW: Okay.

MR. HUMPHRIES: – if they were or not.

MR. PEDDIGREW: If it was an issue that was at the forefront, would you agree that that's something you would recall?

MR. HUMPHRIES: I would think so, yes.

MR. PEDDIGREW: Mr. Stratton gave some evidence back in September about load forecasting and the practices he used for load forecasting; you talked a little about it today. And I realize he is the expert and he reported to you, but you wouldn't necessarily consider yourself a load forecaster, certainly.

But with the consideration being given to developing Muskrat Falls, do you know was there any consideration given to, I guess, a special type of analysis for load forecasting, or the fact that this wasn't your typical kind of load forecasting. I know you said you had – you're aware that there are 50-year forecasts out there, but I would suggest that Muskrat Falls or the possibility of Muskrat Falls is somewhat unique. Would you agree with that, developing Muskrat Falls?

MR. HUMPHRIES: Well, yes, but I mean, the fact that –

MR. PEDDIGREW: Certainly bigger than anything Hydro had done during your career.

MR. HUMPHRIES: Yes.

MR. PEDDIGREW: And so, I guess in that context then, would – was there any consideration given to, oh look, this is how we forecast generally, you know, in our normal 5-, 10-, 15-, 20-year forecasts, but this is a different type of project, we need to do a different type of forecasting. Was that ever discussed?

MR. HUMPHRIES: No, other than through the review process at DG2 with MHI and their review of the forecasting. They did spend an extensive amount of time coming in, sitting down with Mr. Stratton understanding how we did things and his assumptions and inputs, and at the end of the day that – you know, that, as I recall now that their general thought that the forecast was conservative. They did have some issues with the use of end-use modelling, but at the end of the day I think the conclusions were

that that probably would not make a material difference in the forecast.

MR. PEDDIGREW: Yeah. And my understanding is that Mr. Stratton was the person who did the forecasting within Hydro. Is that correct? And I think he said he had Stephen Goudie there as a resource, but –

MR. HUMPHRIES: Yeah, you know, from some time in, I'd say, 2006, 2007, he was – that was his responsibility. Prior to that, he was probably doing it and Mr. Goudie was signing off and approving it.

MR. PEDDIGREW: But he was the – he didn't have a team of people with him, he was the person.

MR. HUMPHRIES: He had one other person. We did make – we recognized that, or I recognized that as a weakness in our resource that we only had one person. And Mr. Stratton had another staff member that was more – he wasn't a forecaster, he was more of statistics person. And he retired, I'm not sure when. Probably – I'm guessing 2010, maybe 2012 –

MR. PEDDIGREW: Okay.

MR. HUMPHRIES: – I'm not sure. And we did not replace that position with a like person, statistician, we went out and hired a new young economist to bring on to develop and train under Mr. Stratton and eventually take on the role of forecasting and share it with Mr. Stratton as we move forward. And it would be a replacement for Mr. Stratton at –

MR. PEDDIGREW: That would have been, I'm sorry, in the 2010 time frame, thereabouts?

MR. HUMPHRIES: 2010 – no, hang on now. Oh, it was after 2013.

MR. PEDDIGREW: Okay.

MR. HUMPHRIES: It was after 2013. I was vice-president.

MR. PEDDIGREW: So you – so the new person that was brought in to potentially replace Mr. Stratton wasn't brought in until ...

MR. HUMPHRIES: 2013, I think.

MR. PEDDIGREW: (Inaudible) okay.

MR. HUMPHRIES: Again, I'm not 100 per cent sure.

MR. PEDDIGREW: Right, but you remember it based on the position that you were in at the time.

MR. HUMPHRIES: I'm thinking I was vice-president when it was done.

MR. PEDDIGREW: Okay.

MR. HUMPHRIES: Because I was – I know I was concerned and that – yeah, I wanted not to – wanted to get somebody in there that could develop into the role.

MR. PEDDIGREW: Okay.

Mr. Humphries, there's been some questions and some discussion about, I guess, the flexibility, reliability of Interconnected, obviously, versus Isolated. And I believe Mr. Budden just asked you as well about the flexibility; and I guess in your opinion, the flexibility is increased with an Interconnected Option versus an Isolated Island Option. And, I guess, in your view as well you would say it's more reliable.

During your questioning this morning you were asked about a 200-megawatt RFP, I think, that went out in 1997, do you –

MR. HUMPHRIES: Yes.

MR. PEDDIGREW: – recall that?

MR. HUMPHRIES: Yes.

MR. PEDDIGREW: Okay.

And did you say that the decision, ultimately, was made at – that the power was no longer needed, so it was not fulfilled, does that ...?

MR. HUMPHRIES: Yeah. Well, there was a bunch of things happened at that time frame: the load didn't materialize and then shortly after that in 2008 the Abitibi-Consolidated operation in Grand Falls had shut down. So there was a –

there was no longer a pressing need for any generation additions on the Island.

MR. PEDDIGREW: Right.

Would you agree that that's an example of how an Isolated Island system is flexible? I mean, there was an identified need that ultimately did not transpire and so the outlays weren't made to build that new power.

MR. HUMPHRIES: I agree, it's flexible from a cost perspective – a financial perspective, but from an operating perspective and a reliability perspective it's far from flexible.

MR. PEDDIGREW: Right, but in terms of how much money you're gonna spend.

MR. HUMPHRIES: How much money you're gonna spend on that given day, yes, you would. In an Isolated you're spreading your expenditures out for a longer period of time.

MR. PEDDIGREW: In your interview as well there was a question put to you, and you referred to Bay d'Espoir and I think you said that Bay d'Espoir is an example of, you know – if we had not built it 60 years ago where would we be right now? Bay d'Espoir is about – is it – am I correct, 600 megawatts of power?

MR. HUMPHRIES: Yeah, yeah.

MR. PEDDIGREW: Okay. And do you recall that question and that –?

MR. HUMPHRIES: Yeah, I recall, yes.

MR. PEDDIGREW: Okay.

And am I correct – now, I certainly don't know the full history of Bay d'Espoir, but am I correct that Bay d'Espoir – the 600 megawatts was built in increments? It wasn't 600 megawatts built all at the same time?

MR. HUMPHRIES: It was built in three stages.

MR. PEDDIGREW: Okay.

MR. HUMPHRIES: The first 450 megawatts was built pretty well back to back, and the third

unit that – then the 150-megawatt unit was probably built in the mid-1970s.

MR. PEDDIGREW: Okay. And so the first – I think it was 300 watts – megawatts, the first –

MR. HUMPHRIES: Three hundred, then 300 and 100 and – or, oh, no, it wasn't 300. Seventy-five by – 225, 225 and 150.

MR. PEDDIGREW: Right. And were – the second 225 and then the 150, were they built based on demand? Based on need – identified need?

MR. HUMPHRIES: Yes.

MR. PEDDIGREW: And were there ready customers waiting for that power?

MR. HUMPHRIES: I wasn't there, but I anticipate that there probably was. Yes. But – and – just to back back a little bit, and put in context that comment that I made. I'm just talking – back then I was talking about the magnitude of work. When Bay d'Espoir was envisioned back in the 1960s and built, there was basically no power system in Newfoundland.

They not only built the hydroelectric plant. They built a power system – all the high voltage transmission lines and all from a risk and exposure perspective and the complexity of the work that had to have been done – that was nothing compared – or Muskrat Falls, in my opinion, was nothing compared to what those people had to go through when that was built.

MR. PEDDIGREW: Who built that? Who built Bay d'Espoir? Was it an engineering company out of Montreal?

MR. HUMPHRIES: Yeah. It was probably engineered out of Montreal – Montreal Engineering or (inaudible) –

MR. PEDDIGREW: It wasn't a Crown corporation of the province?

MR. HUMPHRIES: No. It – but it was done for the Crown corporation. No different.

MR. PEDDIGREW: And I don't know the answer – I don't know if you do – but do you know who – was there similar legislation in place then, that indicated the ratepayers would pay the cost no matter what, like there is for Muskrat Falls?

MR. HUMPHRIES: I have no idea. But they end up – they did pay all the costs, I think, at the end of the day.

MR. PEDDIGREW: But you don't know how it was ultimately paid for.

MR. HUMPHRIES: Yeah. I don't know. I don't know how it was.

MR. PEDDIGREW: Right.

There's some reference as well in some of your questions during your interview, and again this morning about the Maritime Link and you seem to be suggesting that it would be, you know, a backup system. Would that be a fair –

MR. HUMPHRIES: Yes.

MR. PEDDIGREW: – assessment of –?

MR. HUMPHRIES: Definitely.

MR. PEDDIGREW: Okay. And so if the Labrador-Island Link went down –

MR. HUMPHRIES: We could import power from Nova Scotia. Yes.

MR. PEDDIGREW: Right. And you talked, during your interview, about a limit on how much can be brought in – I think it was 325 megawatts – based on some sort of (inaudible) situation?

MR. HUMPHRIES: Yeah. Right now there are constraints in the Maritimes and New England that would limit the import to around 325 megawatts.

MR. PEDDIGREW: What are those constraints? So (inaudible)

MR. HUMPHRIES: It's a transmission constraint, and when you look at all the possible configurations that – if you got any more than

325 going out and you lose one of the lines it could cause overloads and those types of things.

MR. PEDDIGREW: So as of today, if we had to –

MR. HUMPHRIES: Bring it –

MR. PEDDIGREW: – go to Nova Scotia we'd be limited to 325 megawatts as far as you are aware?

MR. HUMPHRIES: Yes.

MR. PEDDIGREW: Okay. And you had made some reference as well to – you feel that might change in mid-2020s.

MR. HUMPHRIES: Yeah. It's obvious that, you know, there is a – there is a bottleneck between Nova Scotia and New Brunswick's transmission systems. Now – and it's – basically goes right on down – almost down to the US border. But the – at least back in 2010, 2012 when we were talking about – the thought was that that transmission upgrade would happen naturally, probably, in the mid-2020s and then the restriction on the import to Newfoundland would probably be eliminated.

MR. PEDDIGREW: And do you know – has that transmission upgrade happened or are there any plans –

MR. HUMPHRIES: It hasn't happened yet and I don't know – and I haven't been following it since I retired.

MR. PEDDIGREW: So if it doesn't happen we'll stay at that 325 limit?

MR. HUMPHRIES: Conceivably. Not necessarily. There may be other ways around that as well.

MR. PEDDIGREW: You're not aware of what other ways there would be –

MR. HUMPHRIES: Well if there were local generation in Cape Breton that could be close to the terminals – closer to converter stations, you could probably bring the full 500 down.

MR. PEDDIGREW: So – I would suggest that, based on a couple things, I guess; one, there being additional generation that takes place in other provinces –

MR. HUMPHRIES: Yes.

MR. PEDDIGREW: – Nova Scotia –

MR. HUMPHRIES: Yeah. Yup.

MR. PEDDIGREW: – which we don't know whether that will happen.

MR. HUMPHRIES: And we don't, but as we move forward in an interconnected environment, you know, we will – we have already joined and participated in the Atlantic planning area and if we're in a situation where we are providing reserve support to the Maritimes, the opportunities of eliminating our – those bottlenecks and moving forward – would be on the radar as we move forward to alleviate them because they would have – be a benefit to both sides.

MR. PEDDIGREW: Do we – like, do we have – do we know for certain that there is available power in Nova Scotia if we needed it?

MR. HUMPHRIES: Yeah – that – well I don't know, Nova Scotia –

MR. PEDDIGREW: Through Nova Scotia?

MR. HUMPHRIES: Through Nova Scotia there is a gas plant that Emera owns in New Brunswick that only operates – it's 300 megawatts. It only operates for a portion of the year. It supports – there's a part of the year that it sits idle, so there's potential – there's – there are – there is potential out there. They have reserves which they can carry, that in an emergency situation, could be shared. Just like we will have reserves that we can share with them.

MR. PEDDIGREW: Right. But – if – as long as Nova Scotia is not needing that power at the time.

MR. HUMPHRIES: Yes. Yes.

That goes for any utility, anywhere –

MR. PEDDIGREW: Right.

MR. HUMPHRIES: – when you get into reserve-sharing.

MR. PEDDIGREW: In a situation where Nova Scotia may be buying power from us through the EAA.

MR. HUMPHRIES: No, I think there are – I know in the agreement on the firm block – the Nova Scotia Block, the 170 megawatt piece – if there's an issue in – with the Labrador in-feed, where the transmission from Labrador is lost, that's a forgivable event in that agreement and we're not required during that to supply Nova Scotia anything, and I –

MR. PEDDIGREW: Okay.

MR. HUMPHRIES: – and I'm thinking there's similar – similar language in the EAA as well.

MR. PEDDIGREW: Okay.

So Muskrat Falls comes on stream, is that – what's your understanding of what happens at Holyrood after Muskrat Falls comes on stream?

MR. HUMPHRIES: Well, at – there was a period – Holyrood was gonna be kept in a – various states of standby for, at one point they were – we were talking about up to possibly five years.

The first – at least the first winter it would be kept in what they call a hot standby, so that it – if there were an issue it could be ramped up in – to generate in a fairly short period of time. After that, there would be a period of time that it would stay in cold standby, and cold standby for Holyrood is a – take several days to get that unit – those units up from cold.

MR. PEDDIGREW: Is the plan for now that Holyrood will remain as a backup?

MR. HUMPHRIES: No, the plan was that – I think at least by 2020, in it's – in that time frame, that the plant in Holyrood would be retired. Portions of unit 3 would be kept for the synchronous condensing capability it has.

MR. PEDDIGREW: For the what, sorry?

MR. HUMPHRIES: Synchronous –

MR. PEDDIGREW: Okay.

MR. HUMPHRIES: – condensing capability?

MR. PEDDIGREW: Yeah.

MR. HUMPHRIES: So, there would still be a footprint at Holyrood. The new combustion turbine that we added in 2014, that would've been – continued to operate at Holyrood, and the thoughts were that at points along the road, that should additional combustion turbines have to be added, that they would be added at Holyrood because it's – consolidate that operation.

MR. PEDDIGREW: And do you know to what extent the – I guess these aspects of the continuing operation at Holyrood – do you know to what extent they were factored into the CPW analysis for Muskrat Falls?

MR. HUMPHRIES: Well, there were costs included, and any upgrades that were needed on the Island system to make it work – and going forward – were included in the, you know, the work at Holyrood, for argument sake, that's sort of outside the project scope, and if you had to add combustion turbines in the future, they would've been included, yes.

MR. PEDDIGREW: Your understanding is they would've been included.

MR. HUMPHRIES: Yes, they're in the expansion plans. You can see in –

MR. PEDDIGREW: Okay.

MR. HUMPHRIES: – 2030 there's – we start adding combustion turbines again.

MR. PEDDIGREW: Okay.

I guess shutting down Holyrood, if that is ever a decision that's made – is that a Newfoundland and Labrador Hydro decision or is that something that requires approval by the PUB?

MR. HUMPHRIES: I'm not sure.

MR. PEDDIGREW: My understanding is it requires approval of the PUB, but you're not certain of that, are you?

MR. HUMPHRIES: It probably will. I'm just remembering now, I think there is an abandonment clause there that – I remember being involved in a hearing when we shut down Roddickton and there wasn't a PUB hearing on that (inaudible).

MR. PEDDIGREW: Okay.

Madam Clerk, if we could call up Exhibit P-00528, please? And page 19. And down towards the bottom of the page, please. Okay, that's good, thank you.

Now, Mr. Humphries, this is – you may not have seen this exhibit before, it's a paper that was presented as part of this Inquiry process by Professor Guy Holburn. So down at the bottom of the page, you can just read – I'll give you a second to read along there the last paragraph that begins with "The PUB was not the only independent body ..." So I'll just continue reading.

"The PUB was not the only independent body that did not endorse the economic case for Muskrat Falls. The federal-provincial Joint Panel Review (JRP), established in January 2009 primarily to assess the environmental impact of the Muskrat Falls project, also considered the need for and alternatives to the project as part of its mandate. Unlike the PUB, the JRP had the latitude to consider all possible options. After more than 32 months of deliberations and 30 days of public hearings with 230 presentations in nine locations, it issued its 389-page report and recommendations in August 2011. Based on the evidence submitted by Nalcor and intervenors, the Panel concluded that."

So: "that:

"...the Panel did not accept that developing the hydroelectric potential of the lower Churchill River was a "need", and that therefore the Project should be compared to reasonable alternatives that addressed the future demand for electricity...the Panel concluded that Nalcor had not demonstrated the justification of the

project as a whole in" – general – "and economic terms..."

So just on that first paragraph, would I be – would it be fair to say that you disagree with the statement that developing the Lower Churchill is not a need?

MR. HUMPHRIES: It – development of the Lower Churchill was one alternative for satisfying a need. There was a need in the province for new generation.

MR. PEDDIGREW: Based on the forecasts?

MR. HUMPHRIES: Based on the forecasts, and it was very current. And I mean, I don't think anyone will argue that when – after what happened in January 2014, that we had a shortage of generation or we had an issues, so there was a need. Now, there were a number of ways, obviously, to satisfy that need, and that's what the analysis did – looked at a (inaudible) – Muskrat Falls and the Labrador infeed were one of the alternatives, and that – they were evaluated on that basis.

MR. PEDDIGREW: Right. But I guess the conclusion that the JRP made that the development of the Lower Churchill to fulfill that need – developing the Lower Churchill was not a need. Would you – you would disagree with that?

MR. HUMPHRIES: Yes, I think it – based on the analysis that was done, that it – the development of Muskrat Falls and the Lower Churchill – it was satisfying a need and – a current need. Now, was it more than was needed to satisfy that need? That's an academic question, and – but based on the analysis that was done, the information that was available at the time, the load forecasting that was done at the time, it showed that, in the longer term, it was the preferential thing to do.

MR. PEDDIGREW: And then the second paragraph in the JRP, it says here: "...the Panel concluded that Nalcor's analysis, showing that Muskrat Falls to the best and least-cost way to meet domestic demand requirements, was inadequate and recommended a new, independent analysis based on economic, energy and environmental considerations. The analysis

would address” – so, again, the independent analysis they’re talking about here – “would address domestic demand projects, conservation and demand management, alternate on-island energy sources, the role of power from Churchill Falls, Nalcor’s cost estimates and assumptions with respect to its no-Project thermal option” and “the possible use of offshore gas ...”

So given that the JRP was saying an independent analysis of all these factors should be considered, was it ever suggest, by Hydro, to government or to Nalcor, that – let’s put the breaks on here. Let’s take a little bit of time, maybe another couple of years, and see if we can get some more information on things like conservation and demand management?

MR. HUMPHRIES: I don’t know. I wouldn’t have been at a level, at that time, where – to be involved in those types of discussions. If they happened, they would have been at a level higher than me.

MR. PEDDIGREW: It was never anything you raised with anybody?

MR. HUMPHRIES: No, I mean, we, you know – I had to – I grew up in the regulated environment. We’re used to a Public Utilities Board and those processes. And if we were – if it were told to me that we had to go down that road, I’d have no issues with that. We’re used to it. They do it. Yes, it’s a lot of work and a lot of process, but I would have no issue with that.

MR. PEDDIGREW: And the generator – the turbine – and I may be using the terminology incorrectly, but the turbine generator, 140 watts, that was added after DarkNL that added some, I guess, stopgap capacity.

An option like that, is that something that would’ve bought Hydro some additional time to carry out some of these exercises?

MR. HUMPHRIES: Conceivably, yet – you know, that is a stopgap thing. It burns fuel. It burns a lot of fuel. So they’re – depending how long and the cost – but yes, it would have kept the lights on.

MR. PEDDIGREW: And based on your answers this morning, I think that you felt

Newfoundland and Labrador Hydro was in the early stages of its assessment of how valuable conservation and demand management could be or how much you could reduce power demand with CDM. Is that fair?

MR. HUMPHRIES: Yes.

MR. PEDDIGREW: So some additional time to study that and its effect and impact might have been useful for Newfoundland and Labrador Hydro?

MR. HUMPHRIES: Possibly, yes.

MR. PEDDIGREW: When you said this morning that – and again, if I misquote you, certainly clarify – but I think you said that in about 2006 or 2007, when the provincial Energy Plan came out, that talks of moving towards an IRP went cold, I think you said. I just want you to elaborate on that a little bit. What do you mean by went cold?

MR. HUMPHRIES: Well, I don’t recall it being much of a priority any more or any discussion to those ends of moving forward into an IRP process.

MR. PEDDIGREW: And prior to it going cold, what was the general discussion around IRPs?

MR. HUMPHRIES: Well, I think that, you know, that we were considering that that – this might be an option that – to go down for completeness. And you know, there had been discussions at the Public Utilities Board. And I think if – there’s a – evidence there somewhere from Mr. Haynes at a 2006 rate hearing, and there was discussions about it. And it didn’t indicate a resistance to move down that path.

And the fact that – I think everybody acknowledged that it was a – would be a significant effort for Newfoundland Hydro in the – given the resources it had at the time, to get that type of process up and running. But look (inaudible) – at the end of the day if it were decided that yeah, this was the way to go, I personally wouldn’t have had any issues. It’s ...

MR. PEDDIGREW: Did you have any feeling one way or another as to its value, its utility? Did you think it was a (inaudible) –?

MR. HUMPHRIES: Well, I somewhat questioned, at the end of the day, would it come up with anything different? And, you know, one of my larger concerns at the time probably would have been yeah, I will do it, but you gotta give me the resources to do it with. I just ...

MR. PEDDIGREW: You've got to spend money for good information.

MR. HUMPHRIES: Yeah. I can't do it – you know, my view was that we can't do it with the configuration and resources we have internally at that time, right?

MR. PEDDIGREW: Right. It's an in-depth process.

MR. HUMPHRIES: It is. It's involved, drawn out, a lot of stakeholder involvement and that in itself is an education process to get people, all the people to a common place. It's a significant effort.

MR. PEDDIGREW: Has potential to provide useful information certainly.

MR. HUMPHRIES: Potentially, yes.

MR. PEDDIGREW: One question you were asked about this morning was about the \$600 million for the scrubbers and to include it in the CPW for the integrated, or sorry for the Isolated Island. And you said, I think, this morning that you think it came from the project team but you couldn't say for sure. I was just wondering, why do you think it came from the project team direction, that direction?

MR. HUMPHRIES: Well, I'm really not sure and again I just – I'm not sure if it came down through or if it came from the Nalcor executive. Other than the project team of which there's a lot of commonality, I really can't be sure, I don't recall.

MR. PEDDIGREW: But did it come from Nalcor?

MR. HUMPHRIES: Well, ultimately, it came from the Energy Plan, which was – so whether it was Nalcor or the government, I don't know. If that's the question you're asking me, I don't know.

MR. PEDDIGREW: Okay. It wasn't a Hydro decision?

MR. HUMPHRIES: I don't think so. Not that – no, it was a given.

MR. PEDDIGREW: Given meaning you were told.

MR. HUMPHRIES: Told to put it in.

MR. PEDDIGREW: Just a few more questions, Mr. Humphries.

So something like that, being told to include that, I guess I'm just wondering, so when Hydro – when Nalcor was created, and I guess there was some integration and some work between Nalcor and Newfoundland and Labrador Hydro. Just explain, what was the work environment like? Once Nalcor was created, did it change?

MR. HUMPHRIES: Yes, I think it changed, changed over time. Obviously, you know, there was always this bigger picture and, you know, that – and again a lot of that tied back to the Energy Plan and the vision that was in that. Obviously, that from the perspective of the project and it moving forward you had a large team over there that was growing and developing, doing all kinds of work and – but from the Hydro's perspective, not a – particularly from the resources, we were getting the requests to do work in support of Nalcor developments for projects.

We were Hydro employees. We all had Hydro jobs that we had to do, and we weren't – did not have a whole lot of extra resources. We might have got an extra person or something like that, that we had to train and develop to help us through.

So, yes, there were changes, but from the perspective of how it impacted me, other than that I had more work to do, probably not a whole lot.

MR. PEDDIGREW: Was there any sort of sense among the existing Hydro employees that there was, I guess, less of a priority on the traditional aspects of what Hydro was responsible for, prior to Nalcor?

MR. HUMPHRIES: Not that I sensed at that – I don't – I can't say that I sensed that, right.

MR. PEDDIGREW: You didn't sense that, personally?

MR. HUMPHRIES: No.

MR. PEDDIGREW: Okay, those are all my questions.

Thanks, Mr. Humphries.

MR. HUMPHRIES: You're welcome.

THE COMMISSIONER: All right.

NunatuKavut Community Council?

MR. RYAN: Good afternoon, Mr. Humphries.

MR. HUMPHRIES: Hi.

MR. RYAN: Just very quick questions; more a point of clarification.

This morning, while Mr. Learmonth was questioning you, you mentioned that, as it related to small-scale hydro projects on the Island of Newfoundland, that you sensed there was feeling that these types of projects wouldn't pass environmental assessments. Is that a fair characterization of what you said this morning?

MR. HUMPHRIES: Yes, I think so.

MR. RYAN: And is that your opinion or would you say that's the general opinion shared by people at Nalcor?

MR. HUMPHRIES: I think that was a general opinion that was shared; it's not my personal opinion.

MR. RYAN: Could you elaborate on why those particular projects would be unlikely to pass environmental assessment?

MR. HUMPHRIES: And, you know, not all of them, but I – as I recall, a lot of these had significant fisheries issues, salmon, in particular, that the feeling would be – I think the feeling was that to actually mitigate the fisheries issues to a satisfactory level would be – if it could be

done at all – would be cost prohibitive, and the costs would be a significant portion of the overall cost of the project.

MR. RYAN: And when you say fisheries issues, can you just explain –

MR. HUMPHRIES: Well, these – a lot of these were salmon rivers and salmon go up these rivers every year and spawn and come back down, and so there was – there would've been a concern that the development would effect that resource.

MR. RYAN: So, generally speaking at Nalcor, the feeling was that a river that has salmon in it, unlikely to pass an environmental assessment.

MR. HUMPHRIES: Well, I think, you know, again, I'm not the environmental person, but based on developments that have already been done and the level of effort that had to be put into it to mitigate these types of issues, you know, there was some experience there in what this would cost and how it would impact the project. And some of these projects are pretty small so that, you know, you'd be – and in lots of cases, the mitigation costs for the small project could be just as significant as a larger 50-megawatt project, for argument sake.

The fisheries issues are fisheries issues, and, you know, that would be a huge burden on these projects. So, you know, that's an example of why some of these things would've been screened out.

MR. RYAN: Mm-hmm.

MR. HUMPHRIES: You know.

MR. RYAN: That leads me to my next point of clarification, which is that, as I noted, you said something to the effect of the order of magnitude of the smaller proposed projects or potential projects on the Island would make them less viable.

MR. HUMPHRIES: Yeah, they could not support a large environmental mitigation cost. That would be enough to tip the economics of the project. The cost could be significant in relation to the cost of actually developing the project.

MR. RYAN: So when you reference the order of magnitude, you mean –

MR. HUMPHRIES: More on size than – it's the size of the projects compared to the level of mitigation that they would (inaudible).

MR. RYAN: So the amount of electricity generated by these potential projects would essentially not be worthwhile –

MR. HUMPHRIES: Cost effective.

MR. RYAN: – given the environmental mitigation efforts that you assume would have to take place.

MR. HUMPHRIES: That's correct.

MR. RYAN: Okay. Those are all my questions.

Thank you very much.

THE COMMISSIONER: Thank you.

Grand Riverkeeper Labrador/Labrador Land Protectors?

MS. URQUHART: Good afternoon.

MR. HUMPHRIES: Hi.

MS. URQUHART: Good afternoon. Caitlin Urquhart, and I am representing the Grand Riverkeepers and Labrador Land Protectors – who you may be familiar with our environmental organizations, and – based in Labrador. And so I just have a few questions; much of this was sort of, canvassed by the examination by Mr. Learmonth, so I won't belabour the points, but just in terms of conservation and demand management. So as I understand it, your concern was that these targets weren't being met reliably, and that's why they weren't incorporated into load forecasting, is that –?

MR. HUMPHRIES: Yes, basically, my concern was that there was not enough information there to – to assure that there would be to –

MS. URQUHART: So, your meaning in terms of the targets that would have been set out in the

2008 five-year plan, is that what you are referring to?

MR. HUMPHRIES: Yes.

MS. URQUHART: And so, I mean, I guess – my challenge here – like, my question to you, or my – what I'd like a clarification on is: so the government has a policy to engage in conservation and demand management; they have a department as they – you've indicated, folks within Newfoundland Labrador Hydro that are working on this; and they've got targets, they've got funding going towards it. So, in the face of all that, you're still – you're deciding that's not important enough or it's not significant enough to consider in load forecasting.

MR. HUMPHRIES: Back in 2010, it wasn't significant enough. I really don't know what information really is there today, I've been removed from it for a couple of years and – but yes, based back in 2010, my view was that, and I think the system plan view was that, that if we incorporated these things into our forecast at that time, there was a significant probability that we would not achieve them. And that would leave us short on the supply side.

MS. URQUHART: So, it's a sort of, a conservative estimation, is that – that's kind of the justification; it's in order to be conservative in our estimates of the forecast (inaudible).

MR. HUMPHRIES: Yeah, you know, it's – there is a real desire that these plans that – the expansion plans that we put together for the isolated system – that they can be delivered upon, and that we're going to have the resources and – that we need to meet the load. And (inaudible), and I think, you know, that it's – to a certain degree it's not a lot different that the wind.

We've kept the wind now at about 300 megawatts; based on the information we have, we feel that that is the most we can comfortably integrate into the system. There is further potential, but there are a lot of unknowns to be addressed and the CDM at the time was not a whole lot different that these targets were out there but could they actually be achieved. There was not a confidence level and a lot of that was

based on where we were. And like I said I don't know where – today it might be different, but back then at that time it wasn't.

MS. URQUHART: So yes, on that point, I'd like to just go to 2010 and look at some of the numbers that were being provided by your organization at that time and I'm actually getting my numbers from – it'll be Exhibit 00367.

So this is actually a Nalcor document, but they've used the NLH systems operation figures. So on page – and this is a submission, just to give you some context, this is from a submission in April 2011 from Nalcor to the Joint Review Panel.

And if we go to page – oh, sorry, you know what? I'm looking at the wrong document. Sorry, if we could pull up P-00077, apologies. Sorry for that.

And so this is from November 2010 – or sorry, 2011. And it is on page 34, it'll indicate the information that we had at that – those dates. If you just scroll down a little bit more, so this is the table here. And as I say the figures are coming from Newfoundland and Labrador Hydro, Systems Operation. So would that be your – would that be partly from your – like systems operations or that's a separate department?

MR. HUMPHRIES: No, that would have been done through our conservation group –

MS. URQUHART: Okay. Hello

MR. HUMPHRIES: – or whatever.

MS. URQUHART: So in terms of here, we see the five-year plan target in 2009 and 2010, and then the actual amount that was conserved. And on my math I have for 2009 they were 71 per cent of the target and in 2010 they were at 64 per cent of the target. So yes, in my view, perhaps that they're not meeting the target but they're – they are certainly making substantial gains towards those targets. So I guess, I wonder – I understand that you're saying that we're not reliably meeting the targets but there is conservation happening and I wonder what you have to say in terms of why that wouldn't be incorporated into the planning.

MR. HUMPHRIES: Well, it's happening. Do we have enough of a database to determine that it's going to continue to happen? Have we got enough experience with it? And those would have been the concerns that, yeah, we're not achieving our targets at the current date, the current time, and are these going to be sustainable into the future.

MS. URQUHART: So do you have any thoughts as to why we wouldn't have been meeting our targets at that time?

MR. HUMPHRIES: Well, a lot of it, I think, was probably customer uptake in the initiatives that were out there, and, you know, that may be, could be, you know, a lot of reasons for that. Some of it might just be a lack of awareness that we weren't promoting the program enough, I don't know. But it was happening.

MS. URQUHART: So if I can actually go back to the other tab, 00367 there, on page 20. So again, this is a document produced by Nalcor and it indicates here – just scroll down a tiny bit – just below the table here, the forecast considers two key points, and the first point there: "There's a ramping up and growth stage as the market becomes aware of an interested in efficient technologies." Which is exactly what you'd mentioned.

So given that these programs came online, or the plan started in 2008, and we anticipate – like, Nalcor's anticipating that these programs are going to ramp up as people become aware, as you say, as these projects become advertised, I guess, you know, was it known to folks within the forecasting team that these projects are intended to ramp up over time, that that's how the programs work?

MR. HUMPHRIES: Yes, I'm sure they would have been aware, yes.

MS. URQUHART: And if we can scroll down, actually, to page 21 there's a section that's called "Program Expenditures" there and so – excuse me – I did look, there's a table that indicates in 2009 1.7 million was spent on the program, in 2010, 2.6, and in 2011 they were anticipating spending 3.1 million on conservation and demand management programs. That says here in the first line, so:

“Provincial budget for 2011 CDM is currently \$3.1M, approximately 0.75% of utility revenues.”

And it goes on to indicate that essentially in the Marbek study that we were talking about earlier they recommended 1.5 per cent of revenues. So they’re about half of the targeted expenditures at that point. So I guess I wonder whether, you know, in your opinion, would that have been impacting on the ability of these programs to be successful?

MR. HUMPHRIES: It may have, I’m really not sure I’m qualified to comment on that. And, you know, and I think – just trying to it in a little more perspective from where I’m coming from, and the fact that we did not – we were of the view – we did not have a good number that we could bank on from a – to incorporate either in the forecast or the analysis. But we did do a sensitivity analysis that reflected if we achieved these lower or higher targets; what it would mean to the analysis.

And that was informative and, you know, yes, it did decrease the CPW difference, but it didn’t turn the project around. So from the perspective of the point that we ignored it completely, I – we didn’t ignore it completely. It’s there and there was a comparison done. And, you know, and I don’t know if, currently, Hydro includes anything in their load forecast or what the intended plans are. Like I said, I’ve been removed from it now for a while, so I don’t know.

MS. URQUHART: So – and I guess just to speak to that because you brought up the sensitivity analysis. When I did look at the – so again, this was on P-00077, Madam Clerk, if you don’t mind, on page 134. I think that’s where it indicates the sensitivity analysis that was done specifically for the Isolated Island Option.

And I’ll note just – I think it bears noting that the moderate conservation figure that was used is 375, whereas the – by 2031 – whereas the Marbek report indicated that the achievable lower limit, which in my view would likely be the – you know, I would see that as being used as the moderate benchmark – was 556-gigawatt hours by 2026. So the moderate target here is

even substantially lower than that. And, again, the aggressive target there at 750, the upper limit of what Marbek has suggested. And not to say that that necessarily has to be used, but that was – just for a reference – that was 951-gigawatt hours by 2026, rather than the 750-gigawatt hours by 2031.

MR. HUMPHRIES: Again, yes, I – and I don’t recall where these limits that were actually used came from. They probably would’ve come out of the people that were developing the program. I don’t know. I don’t recall.

MS. URQUHART: Mmm.

MR. HUMPHRIES: But I think that, you know, as a minimum that the impact of a modest to moderate CDM program was evaluated as part of the analysis, but it – no, it was definitely not incorporated into the overall long-term forecast, so – or the expansion plan that we ultimately landed on for the Isolated system because of the concerns with the ability to deliver and sustain these results.

MS. URQUHART: Yeah. (Inaudible) just –

UNIDENTIFIED MALE SPEAKER: Mr. Commissioner, can I ask if the witness could speak closer to the mic? It’s difficult to hear.

MR. HUMPHRIES: Sorry, sure.

MS. URQUHART: And I guess in – given that there was a, you know, a policy and a plan in place to create the, you know – to achieve these savings, I guess, I wonder from your opinion why – like, who was (inaudible) down it and why wasn’t that happening?

MR. HUMPHRIES: I really can’t comment on that.

MS. URQUHART: Okay. That’s all.

Thank you.

THE COMMISSIONER: Okay. Thank you.

Emera Inc.?

MR. O’KEEFE: No questions, Commissioner.

THE COMMISSIONER: Okay.

Former Nalcor Board Members?

MS. MORRIS: No questions, thank you.

THE COMMISSIONER: Thank you.

All right, Nalcor Energy.

Did you want to take a break now or do you wanna wait and – or do you wanna start and we'll take our break around 3:30 or so?

MR. SIMMONS: I think we'll start now and I –

THE COMMISSIONER: Perfect.

MR. SIMMONS: – I may not be too long, so ...

THE COMMISSIONER: Yeah.

MR. SIMMONS: Unless, Mr. Humphries, you'd prefer a break at this point.

MR. HUMPHRIES: No, that's fine.

MR. SIMMONS: Okay, good.

So Mr. Humphries, a couple of questions first about System Planning, generally. You were the manager of the System Planning department from 2005 to 2011 – you've told us. So can you give me a general description of what the kind of role and responsibilities of the System Planning department was in that time period?

MR. HUMPHRIES: Well, the main role was to monitor the performance of the system, current and going forward, against the adopted or accepted planning criteria for the systems, and the systems would've included the Isolated Island system on the Island – the Isolated Island system which includes the generation and transmission network on the Island, the bulk system. It would've included the generation on that system.

We would also look at the rural isolated systems, some on the Island and Labrador, and there was also a small area that – areas that are not serviced by Newfoundland Power that we would do the distribution evaluations as well. So there were – there are criteria, planning criteria set out

for all of these various pieces of plant, and annually we would – once the load forecasts was generated, we would evaluate those, evaluate the system against the criteria to ensure that we were meeting the criteria in all area and that there was no violations.

And we would do that – normally you'd look at 20 years; you would identify if there were violations of the criteria. You would evaluate alternatives to eliminate the violations and then recommend the least-cost technically acceptable alternative, as a capital budget proposal for the year – or prior to the year that the violation occurred to get that in the works to have it in place to alleviate the problem.

MR. SIMMONS: So leaving aside the Lower Churchill Project all together, if I understand correctly, the System Planning department would be responsible for preparing an annual load forecast for the power system for the province –

MR. HUMPHRIES: Yes.

MR. SIMMONS: – correct? Yeah.

And for each of the different systems within the province, there were a set of criteria that had to be met and if not, there'd be – what you called – a violation of the criteria. So for example, for generation would that mean there had to be a particular level of reserve available compared to the, you know, compared to the forecast load over that 20 years?

MR. HUMPHRIES: Simplistically, yes.

MR. SIMMONS: Simplistically, so that's – okay.

And this type of planning would be done annually and each year you would look ahead for the next 20 years?

MR. HUMPHRIES: That's correct.

MR. SIMMONS: And the planning would be done for generation as well as transmission?

MR. HUMPHRIES: Yes.

MR. SIMMONS: Yeah, okay.

Now, that's System Planning – there was also a department within Hydro, through this time period I think, called System Operations?

MR. HUMPHRIES: Yes.

MR. SIMMONS: And how do you distinguish what System Operations does from what Systems Planning did?

MR. HUMPHRIES: System Operations does as its name suggests, they operate the system.

MR. SIMMONS: Mmm.

MR. HUMPHRIES: So the System Operations group would be the people responsible for the operation of the Energy Control Centre and ensuring on a day-to-day basis that there's enough resource out there available and ready to go to supply the anticipated load for the next –

MR. SIMMONS: And there's –

MR. HUMPHRIES: – 24 hours to seven days.

MR. SIMMONS: And there's also an engineering department within Hydro through that time period, was there?

MR. HUMPHRIES: Yes, there was.

MR. SIMMONS: And generally, what sort of things would engineering do as compared to what System Planning would do?

MR. HUMPHRIES: Well, they would engineer and execute the capital work –

MR. SIMMONS: Mm-hmm.

MR. HUMPHRIES: – that's coming out of the capital plan. And they would also supply – if we were System Planning for argument sake and we're doing an analysis of alternatives to rectify one of these identified deficiencies, they would provide the – we would go to them with a scope of what we wanted; they would provide a cost estimate to complete that work that would be used in an evaluation –

MR. SIMMONS: Right.

MR. HUMPHRIES: – and ultimately it would end up in a budget proposal.

MR. SIMMONS: Okay. All right.

So we've heard in your evidence this morning that, as part of this ongoing work that system planning does, there would be a portfolio maintained of potential generation sources that could be looked at when you do your annual planning to make sure that there's going to be enough generation available for the coming 20 years.

MR. HUMPHRIES: That's right.

MR. SIMMONS: Right. And – so in maintaining that portfolio, is that something that system planning would've done by themselves or would there have been engineering input –

MR. HUMPHRIES: There would've been –

MR. SIMMONS: – and that sort –

MR. HUMPHRIES: – engineering –

MR. SIMMONS: – of thing?

MR. HUMPHRIES: – input.

MR. SIMMONS: Yeah. Okay.

Okay, now, I had some questions for you regarding sensitivities. Now, I'd like to go to Exhibit P-00121, please? Page 189.

You were asked about this by Mr. Learmonth this morning. This is the DG3 package, and on page 189, this is a schedule to that package, and this particular page has headed on the top: "Gatekeeper requirement for DG3." There are 14 different things listed there as deliverables, the leader for each, a status, which is a green light, a yellow light or a red light, completion date and then some comments.

You were asked about item number 3. So first of all, what's the status shown here for item number 3?

MR. HUMPHRIES: It's shown as green.

MR. SIMMONS: Okay. So what does green indicate here?

MR. HUMPHRIES: Green generally indicates everything is okay.

MR. SIMMONS: Okay. So that whatever the deliverable was had been satisfied, presumably, to the Gatekeeper's satisfaction. Is that what that indicates?

MR. HUMPHRIES: Yes.

MR. SIMMONS: Yeah. Okay.

And there are three things described there as additional sensitivities: "Loss of Island Industrial, ML" and "additional Labrador load."

So my first question is: Do you recall whether or not these were items that were being asked to be prepared as a sensitivity analysis for inclusion in the Decision Gate 3 package or whether they were for some other purpose?

MR. HUMPHRIES: No. My recollection was that they were not for the inclusion in the package, but they were for information purposes for the – ultimately the Gatekeeper –

MR. SIMMONS: Mm-hmm.

MR. HUMPHRIES: – that related to the CPW analysis; that if certain things were to happen –

MR. SIMMONS: Mm-hmm.

MR. HUMPHRIES: – what would this mean?

MR. SIMMONS: Okay. One of those three, "Loss of Island Industrial load," you've answered some questions for Mr. Learmonth around that.

MR. HUMPHRIES: Yes.

MR. SIMMONS: Let me just say what I understand you said; correct me if I'm wrong. I understood you to say that at DG3, there had been a sensitivity done for the loss of 880 –

MR. HUMPHRIES: Gigawatt hours

MR. SIMMONS: – gigawatt hours of load, which was a proxy for modelling the closure of the paper – pulp and paper operation in Corner Brook.

MR. HUMPHRIES: Yes.

MR. SIMMONS: But it had been a simplified calculation just to remove the load from the load forecast.

MR. HUMPHRIES: That's correct.

MR. SIMMONS: And that you've told us that, at this stage, there had been a request to look at it a bit more fully to see if there were offsetting costs or other factors that might have affected the full impact of that.

MR. HUMPHRIES: That's right.

MR. SIMMONS: So that's what that one was about, was it?

MR. HUMPHRIES: Yes.

MR. SIMMONS: Okay. Tell me what the ML one was about.

MR. HUMPHRIES: The Maritime Link one was that – that was – and it gets back to some of the issues, I think, that Mr. Budden – one of – had gotten into the benefits of the Maritime Link and the ability to be able to actually bring power back – or it might have been Mr. Peddigrew, actually, that got into it –

MR. SIMMONS: Yeah.

MR. HUMPHRIES: – to bring power back to the Island in the event of an emergency and others – and this looks – was looking a little deeper than in the event of an emergency. There is already wording in the Maritime Link agreements that the – Nova Scotia will, in the event of an emergency, do everything in their power to help us out.

MR. SIMMONS: Mm-hmm.

MR. HUMPHRIES: But this was looking a little deeper and to look at that either through a reserve-sharing agreement or maybe a commercial arrangement might there be an

opportunity there to provide the same benefit that would be provided by the combustion turbines that were going to be added in starting in the 2030s –

MR. SIMMONS: Mm-hmm.

MR. HUMPHRIES: – over the Maritime Link from Nova Scotia at a lot lower cost.

MR. SIMMONS: So that was a request to explore possible benefits that might have accrued from the Maritime Link that had not been taken into account in the CPW analysis?

MR. HUMPHRIES: That's correct.

MR. SIMMONS: Was there anything that was being explored in relation to that that would have resulted in reducing the preference of Interconnected over Isolated?

MR. HUMPHRIES: At that stage – probably not. You know it was the – and the scope of work that was done was not in-depth enough to be able to even determine that. It's just –

MR. SIMMONS: Okay.

MR. HUMPHRIES: – that this is a possible benefit.

MR. SIMMONS: All right. So this was the information to provide to the Gatekeeper. And additional Labrador load, what was that one about?

MR. HUMPHRIES: Yeah, well, that was – and that one turned in to be more of a commentary than anything else. The question was raised – well, what do you do with load growth in Labrador? And the initial answer was, well, load growth will be – in the shorter term – will be supplied with the remaining recall energy from Churchill Falls and then –

MR. SIMMONS: Mm-hmm.

MR. HUMPHRIES: – take that one step further – well, what happens if you use up all the recall?

MR. SIMMONS: Mm-hmm.

MR. HUMPHRIES: And then it came up – you know that – well, if there is surplus capacity available at – for Muskrat Falls and that were used to service load in Labrador, given that the Island customer is paying the full cost of the – that resource and infrastructure, you would expect that now Labrador customers would start to contribute some of those costs, and that would lessen the burden on the Island ratepayers.

MR. SIMMONS: Okay.

MR. HUMPHRIES: That's – in a nut shell, that's what that's all about.

MR. SIMMONS: Okay. Thank you.

Now, you've been asked quite a few questions on conservation demand management. So I'll try not to ask you too many more.

The first question I have is that we've heard evidence from Mr. Stratton concerning something he called, I think, a technological change variable as part of the load forecasting.

MR. HUMPHRIES: Yeah.

MR. SIMMONS: Is that anything you know anything about?

MR. HUMPHRIES: Yes. To my interpretation that is included in the forecast, and that would incorporate conservation things that happen naturally, that – consumers or customers will have a tendency – you go out; you buy a new washing machine. You look at the tag on it as to how much energy it consumes, and –

MR. SIMMONS: Mm-hmm.

MR. HUMPHRIES: – a lot of customers tend to buy the more efficient machines: washing machines, dishwashers, hot-water heaters, televisions. And that's happening naturally. No one is forcing or paying customers to do that, but they do that, and that's – the impact of that is reflected in this load forecast is my understanding.

MR. SIMMONS: Ms. Urquhart brought you to a table – I think it was in the submission that went to the PUB from Nalcor in 2011 – which showed conservation chart targets and how

much conservation had been achieved. You recall seeing that –

MR. HUMPHRIES: Yes.

MR. SIMMONS: – a moment ago? The conservation that had been achieved, that had found its way into the actual consumption patterns of people in the province – do you know whether or not that conservation is reflected or picked up by the technological change variable that's used in the load forecast?

And maybe that's not a question for you.

MR. HUMPHRIES: I'm really not sure.

MR. SIMMONS: Okay. All right. Now, my other question regarding conservation demand management is a comparison question.

Are you able to comment on what you – how you see the risk of relying on conservation demand management in a generation plan for the isolated system, as it has existed on the island, compared to the risk of relying on conservation demand management in a power system on the mainland of North America that's part of the interconnected grid? How would you view the two?

MR. HUMPHRIES: Well – on an interconnected system, the risk would be very low, in my opinion. Because if the conservation didn't materialize – and it might be a bad year, for –

MR. SIMMONS: Mm-hmm.

MR. HUMPHRIES: – argument's sake, I don't know – that you do have options to pick up additional supply from your interconnected neighbours. And that's not a luxury you have on the Isolated system.

MR. SIMMONS: So in a power system in Ontario or New York or Pennsylvania or wherever, if the plan builds in, you know, conservation that does not materialize, the fact that that jurisdiction hasn't built a combustion turbine to provide the power doesn't make the lights go out. Is that correct?

MR. HUMPHRIES: No, at the end of the day, I guess, it ends up in the overall cost but –

MR. SIMMONS: Yes.

MR. HUMPHRIES: – no, from the perspective of a concern of not –

MR. SIMMONS: Right.

MR. HUMPHRIES: – being able to meet the load, there is no concern in there.

MR. SIMMONS: Right.

So for the Isolated system on the Island of Newfoundland then, is the degree to which you consider incorporating and relying on conservation, is that as much a reliability issue as an economic issue?

MR. HUMPHRIES: In my view, yes, very much so.

MR. SIMMONS: Okay.

You've been asked some questions about where the – or why scrubbers and precipitators were considered as something that had to be built into the Isolated Island plan. Can I look at Exhibit P-00073, please? And it's not one that's in your binders, Mr. Humphries.

Okay, this is Exhibit P-00073. It's entitled: *Environmental Benefits of Closing the Holyrood Thermal Generating Station*. Can you scroll down to the bottom of the page, please? And it's from the Department of Natural Resources, Newfoundland and Labrador, November 2012.

Page 6, please. Scroll down. Okay, you can stop there.

The first paragraph under Muskrat Falls reads: "The Provincial Government supports the development of Muskrat Falls to supply electricity to the Island and for industrial development in Labrador. In the event that the project does not proceed, government will require that scrubbers and precipitators be installed at the Holyrood facility."

So this statement from the Department of Natural Resources in 2012 that the government

would require the scrubbers and precipitators to be installed, was that consistent with your understanding at the time that the CPW analysis was being done in that year?

MR. HUMPHRIES: Yes, it was.

MR. SIMMONS: You were asked, I think by Mr. Peddigrew, whether there had been any work done, I presume in 2012 around DG – sanction time, to calculate what the rate was that would be paid by consumers and I think you said you didn't know. In the process of preparing the generation expansion plan, I understand that the load forecast is an integral part of that. Is that right?

MR. HUMPHRIES: That's correct.

MR. SIMMONS: Yeah.

And we've heard explained, I think by Mr. Moulton and Mr. Stratton that it's an iterative process where there's a seed power rate that would be paid by consumers that feeds into load forecast. That generates a system plan, generates a capital cost, goes back to recalculate a rate. Does that sound familiar to you?

MR. HUMPHRIES: Yes. Yes, that's right.

MR. SIMMONS: So as part of the process of carrying that out in 2012, was it part of that process to actually calculate the rate that would be paid by the consumers?

MR. HUMPHRIES: It would have had to have been, yes.

MR. SIMMONS: Yeah. Okay. So it had to have been done in that case.

The only other question I had for you is you've referred a number of times to project team. And we've heard in other evidence that there is a group that's referred to as the project management team at the Lower Churchill Project office.

When you have spoken today of project team, are you referring to that particular group of people or are you thinking of it in some broader sense?

MR. HUMPHRIES: No, that – it's that group of people, yes.

MR. SIMMONS: Okay.

I think you also mentioned at one point that you would have considered Mr. Martin and Mr. Bennett as part of the project team. Is that correct or not?

MR. HUMPHRIES: I would – personally I would have, yeah.

MR. SIMMONS: Okay.

MR. HUMPHRIES: Whether that's correct.

MR. SIMMONS: Right.

So when you've spoken of project team that would extend beyond Mr. Harrington –

MR. HUMPHRIES: Yes, yes.

MR. SIMMONS: – up to include others –

MR. HUMPHRIES: Yeah.

MR. SIMMONS: – who were involved in the project? Okay.

Thank you very much, Mr. Humphries.

MR. HUMPHRIES: Yeah.

MR. SIMMONS: I don't have any other questions, Commissioner.

THE COMMISSIONER: Redirect?

MR. LEARMONTH: Now, Mr. Humphries, in answering Mr. Simmons's question on page 199 of page – of P-00121, do you remember that, about the project deliverables?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: Well, you had a lot more information this afternoon than you gave me this morning. Did you speak to anyone or receive any information from anyone that allowed you to provide greater information in your answer to that question than you had this morning?

MR. HUMPHRIES: No, I didn't.

MR. LEARMONTH: Well, how – why didn't you provide that information this morning?

MR. HUMPHRIES: Well, because you were focusing on one item and I – a couple of times I tried to get into the other items, but you were more concerned – seemed to be more concerned about were any numbers provided and the note on the side waiting on numbers for Ventyx.

MR. LEARMONTH: Okay.

Well, are you saying that this – that all the information was received that addressed the comments?

MR. HUMPHRIES: Other than the piece of information regarding to the Maritime Link sensitivity –

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: – but that was not complete. We ran into issues, as I recall, with the modelling of the Maritime Link in the Strategist model and Ventyx was involved to try to resolve that. And it took quite some time and I, through a question just this week to Mr. Moulton – that is still a work in progress.

MR. LEARMONTH: Okay, that's for the Maritime Link.

MR. HUMPHRIES: For the Maritime Link.

MR. LEARMONTH: Well, this says primary focus. So what about the other information?

MR. HUMPHRIES: The other work – that was done.

MR. LEARMONTH: And so that's available in your documents? In Nalcor's documents there'd be documentation to substantiate what you're saying?

MR. HUMPHRIES: I can't recall whether the –

MR. LEARMONTH: But –

MR. HUMPHRIES: – in what manner that would've been communicated –

MR. LEARMONTH: Yeah.

MR. HUMPHRIES: – to the Gatekeeper or his representative, but the work was done and I'm sure you'd find records from my staff.

MR. LEARMONTH: I don't think we've had – be able to find anything. And when it says awaiting numbers from Ventyx, well, that wouldn't be –

MR. HUMPHRIES: No – yeah, you wouldn't – nothing on that because there was verbal communications and those numbers never came. I will admit to that.

MR. LEARMONTH: Okay.

MR. HUMPHRIES: Those numbers never came.

MR. LEARMONTH: And that's not just the Maritime Link numbers –

MR. HUMPHRIES: Yes, yes.

MR. LEARMONTH: – that's other numbers.

MR. HUMPHRIES: No, that was all the – that was just the Maritime Link.

MR. LEARMONTH: What is – it says: "Awaiting numbers from Ventyx; due next week."

MR. HUMPHRIES: Ventyx is the proprietor of this Strategist software.

MR. LEARMONTH: I know but this says primary focus, it doesn't say sole focus.

MR. HUMPHRIES: Yeah, well –

MR. LEARMONTH: Primary.

MR. HUMPHRIES: – the only piece Ventyx was doing was the Maritime Link piece.

MR. LEARMONTH: Okay.

So this is – it says: “Awaiting numbers from Ventex”

MR. HUMPHRIES: Yeah, and –

MR. LEARMONTH: So what about the word primary there, primary focus?

MR. HUMPHRIES: I really – I don’t know. I didn’t complete this list (inaudible).

MR. LEARMONTH: Do you see my point?

MR. HUMPHRIES: Yes.

MR. LEARMONTH: If there’s a primary focus, there’s a suggestion that there could be other items that have focus.

MR. HUMPHRIES: Well, and, you know – and I could read that as well at this stage that –

MR. LEARMONTH: Okay.

MR. HUMPHRIES: – that the other items were already addressed and that they were still waiting on me.

MR. LEARMONTH: Yeah.

But, you know, we don’t have any of these additional sensitivities. I’m stating that to you.

MR. HUMPHRIES: And they’re really not sensitivities. There was no CPW calculated.

MR. LEARMONTH: Well –

MR. HUMPHRIES: They were really a heads-up on some of these items.

MR. LEARMONTH: They’re not sensitivities but who put this in this document, this official document?

MR. HUMPHRIES: Oh, I – that was done somewhere over in the ...

MR. LEARMONTH: So you don’t even – you’re saying now there weren’t additional sensitivities, that’s a wrong term?

MR. HUMPHRIES: It – I don’t think it’s an appropriate term.

MR. LEARMONTH: Well, what would be an appropriate term?

MR. HUMPHRIES: Possibly additional analysis, maybe?

MR. LEARMONTH: Yeah, because this is an official November 12 –

MR. HUMPHRIES: I realize that.

MR. LEARMONTH: – Decision Gate 3 support package. So you’re saying that in your opinion, this is an incorrect term?

MR. HUMPHRIES: Based on the work that we did on these areas, I would not really consider these true sensitivity analysis.

MR. LEARMONTH: Okay.

Well, we’ll follow up and see what is available because we don’t have anything from that.

MR. HUMPHRIES: Yeah, okay.

MR. LEARMONTH: And you suggested that – in answer to, I think, Mr. Simmons’s question about the CDM – which we covered this morning – that you had some technological factor that you included in the load factor?

MR. HUMPHRIES: In the load forecast, yes.

MR. LEARMONTH: Yeah, but that doesn’t take the place of the full CDM, does it?

MR. HUMPHRIES: Oh, no. It does not, no. It –

MR. LEARMONTH: It’s just a very minor component.

MR. HUMPHRIES: It accounts for the conservation and demand initiatives that are happening naturally in the –

MR. LEARMONTH: Yeah, people’s historical propensity to use more energy sources over time, in other words.

MR. HUMPHRIES: Yeah.

MR. LEARMONTH: Yeah. And that's just an abstract thing, isn't it?

MR. HUMPHRIES: Again, I'm not sure.

MR. LEARMONTH: Yeah, but, anyway, you acknowledge that that's just a very minor component of the – of a CDM analysis?

MR. HUMPHRIES: I think, yes, I would.

MR. LEARMONTH: Okay.

Thank you very much, Mr. Humphries.

MR. HUMPHRIES: Thank you.

THE COMMISSIONER: All right, thank you, Sir.

You can step down.

MR. HUMPHRIES: Thank you.

MR. LEARMONTH: Oh, yeah, there's one exhibit – if I – before I –

THE COMMISSIONER: Sure, go ahead.

MR. LEARMONTH: The – I referred Mr. Humphries to a letter dated November 12, 2008, from Geoffrey Young of Newfoundland and Labrador Hydro to the Board of Commissioners concerning the IRP. And I would like to enter that exhibit as P-01164.

THE COMMISSIONER: Right. And that will be marked then as numbered.

MR. LEARMONTH: Okay. Thank you.

THE COMMISSIONER: All right, so I don't believe Mr. Thompson is here ready to go, so I guess we start tomorrow with him.

So we'll adjourn now until tomorrow morning then, at 9:30.

CLERK: All rise.

This Commission of the Inquiry is concluded for the day.