Government of Newfoundland and Labrador
Department of Natural Resources
Office of the Deputy Minister

OCT 29 2019

Honourable Justice Richard LeBlanc, Commissioner
Commission of Inquiry Respecting the Muskrat Falls Project
5th Floor, Suite 502
Beothuck Building
20 Crosbie Place
St. John's, NL
A1B 3Y8

Dear Commissioner LeBlanc:

Re: Natural Resources Response to Commission Questions

As requested, please find attached the answers to the two questions posed to the Department of Natural Resources relating to mapping of the geotechnical conditions at the North Spur as well as the costing in relation to the Maritime Link. I have included documentation provided to me by Nalcor officials to help clarify the responses.

Thank you for the opportunity to respond. Should you require anything further, please do not hesitate to contact me.

Sincerely,

TED LOMOND
Deputy Minister

Attachments (4)

Department of Natural Resource

Responses to Commission's questions posed to Honourable Siobhan Coady, Minister of Natural Resources during Commission of Inquiry testimony

Question 1:

Commission Text: I would describe the first issue about which you have agreed to provide further information as whether the appropriateness of the method or process used for mapping the geotechnical conditions at the North Spur, (i.e. whether the geotechnical conditions were being mapped as they were found, or were recorded in field notes and later mapped) "was (ever) flagged to you or in your department that was something that would be of concern?" Based on the Commissioner's follow up, I would suggest it would also be helpful if the Department can also confirm whether it has information as to whether the geotechnical conditions recorded in field notes were later mapped, and if so if they were mapped on the as-built drawings.

Department of Natural Resources Response:

The Department of Natural Resources (NR) is not aware of any concern flagged regarding the appropriateness of the method or process used for mapping geotechnical conditions at the North Spur with respect to whether the geotechnical conditions were being mapped as they were found, or were recorded in field notes and later mapped. NR is also not aware that there is any basis for concern over the methods or process used.

In regards to mapping of North Spur construction field notes, Nalcor has advised that its geotechnical engineers' and geologists' field notes recorded during the construction of the North Spur Stabilization works have been incorporated into the SNC-Lavalin "North Spur Stabilization Works - Construction Report" (SNC, 07-Sep-2018, approved 27-Jan-2019), which is the complete As-Built document for the North Spur. The report includes "Appendix C Foundation Mapping" with the first page providing the detailed "Foundation Mapping Plan" and the pages that follow it providing the handwritten field notes and marked-up photographs of the site features for additional detail. The SNC report and appendices are posted online at http://muskratfalls.nalcorenergy.com/newsroom/reports/ under the heading "North Spur and Related Documents"

Nalcor advises that this SNC Construction Report documentation meets the expectation of the Lower Churchill Management Corporation (LCMC) described in its December 2, 2016 letter to the Muskrat Falls Oversight Committee, as follows:

> *"LCMC agrees with this and notes that considerable data has been collected by the engineering team on site and the contractor, including the scope of information cited as useful by the IE. Some upstream mapping of geological features was done during the winter of 2015/2016 and it is acknowledged that much data remains in note-book form and is to*

be transposed for legacy use at a later date. For example, downstream mapping is planned to be completed during the winter of 2016/2017. As-built or record drawings/documents are typically completed after a work scope is completed, and informed by data collected during the construction process. The IE acknowledges in their report that data is being collected, and I can confirm this information will be compiled as as-built/record drawings or documents."

Question 2:

Q: Commissioner: So has the government – to your knowledge, has anyone in your department or in government generally – Finance or whatever – ever costed out what – you know, we're obviously not getting the Maritime Link for nothing. We're paying Emera back for the fact that they've paid the $1.555 billion for the Maritime Link.

Has anyone in government looked at costing – figuring out a method by which you can cost the number for the province to pay back Emera for, the ownership of the Maritime Link in 35 years' time?

I would describe the second takeaway as providing the Department of Natural Resources analysis of the total cost impact of the Project.

NR Response

NR is not aware of any government-led analysis on the cost of the Maritime Link to Newfoundland and Labrador. NR has asked Nalcor to provide records of Nalcor's internal analysis, which follow below and documented further in Attachment 1, 2, and 3.

Nalcor has noted that without the ML and NS Block, surplus energy from Muskrat Falls would be spilled because of limited capacity to the market for this energy through Quebec. Based on this premise, there was no incremental cost to supply the NS Block other than the construction and operation cost of the ML, which Emera undertook. Nalcor further highlights two additional points:

1. With respect to the Nova Scotia Block, in exchange for Emera paying for 20 per cent of the costs of the total project (which at the time was roughly cost of ML) and providing transmission access through NS, Emera would receive 20 per cent of the output of MF.

2. With respect to the Supplemental Block, this arose because Nalcor did not wish to do a 50-year deal with Emera relating to the ML; so the deal was shortened to 35 years and hence the Supplemental Block.

The attached briefings and analysis summary provide some further background on the basis for the ML/NS Block arrangements with Emera. Nalcor advises the first deck was presented to the Premier in August 2010, and then to the Nalcor Board in September 2010 (the Premier in August

2010 was Mr. Danny Williams (https://www.assembly.nl.ca/pdfs/PremiersNL.pdf). Nalcor advises the second deck and analysis summary were presented to the Nalcor Board in November 2010, and may have also been presented to Government, but Nalcor was not able to confirm.

Nalcor has noted the information above has been provided previously to the Commission through interviews, testimony, document submissions, etc.

ATTACHMENT 1

Nalcor Energy Board Mtg . - RE: Emera

Audrey Brophy to: cathy.bennett, g.shortall, ken.marshall, tclift, Ed Martin 09/09/2010 02:18 PM

Cc: julia.dines, cobennett, Peter Hickman, Wayne Chamberlain, Bev Lane

There will be a Nalcor Energy Board Meeting tomorrow at 9:00am (Newfoundland time) Sept. 10, 2010, Level 6 Boardroom, Hydro Place.

Please dial-in as follows:

Toll Free # **1-888-241-3855**

Chairperson Code: (Wayne Chamberlain) **266-5352#**

Participant Code: **054-1590#**

Thank you.
Audrey

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Sept 20/10
Spent Muskrat
Nalcor Bd

Monetizing Muskrat Falls - Draft

August 26, 2010

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Purpose

The purpose of this presentation is to:

- Summarize how the full power output of Muskrat Falls could be monetized
- Summarize the Emera proposal as currently understood
- Seek alignment on elements of a potential counter proposal
- Summarize suggested next steps

- *Note that we are continuing to clarify and refine the data so the contents of this package are not final.*
- *Targeting a Term Sheet for September 25*

Commercial Structure Summary

- The output of the 824 MW MF plant will be 4.9 TWhrs
  - 824MW x 24hrs/day x 365 days/yr x 68% = 4,908,403 MWhrs
  - 4,908,403 MWhrs divided by 1,000,000 = 4.9 TWhrs
- Consider the MF output to be comprised of 3 blocks of power as outlined on the next page

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Commercial Structure Summary

- Block A – NL Block
  - 2.0 TWhrs growing to 3.9 TWhrs over time to approx 2041
  - The growth is due to anticipated normal increasing NL demand
- Block B – NS Block
  - 1.0 TWhr flat for a defined period
  - Period yet to be specified, range of ~ 30-40 yrs under consideration
- Block C – Remaining Power
  - 1.9 TWhrs decreasing to 0 TWhrs over time, as it is "recalled" for NL needs as demand grows in Block A

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Commercial Structure Summary

- In addition, assume the following points;
- The full project cost of generation and transmission (including Maritime Link) is borne by Block A - NL and Block B – NS
  - Block A absorbs 80% of total project costs and receives 2.0 TWh growing to 3.9 TWh over time
  - Block B absorbs 20% of total project costs and receives 1.0 TWh flat over time
  - Block C absorbs 0% of total project costs and is comprised of 1.9 TWh decreasing to 0 TWh over time, as Block A demand increases
    - In effect, this is spilled water, providing $0 value unless monetized
    - Therefore, whatever net value (revenue less associated incremental costs) is received for this power is pure profit
    - The distribution of this profit is yet to be determined
- Are we receiving appropriate value? Let's look at each block:

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Block B – Nova Scotia

- We are in effect getting *[$120-$160 MWh - TBD]* at Lingan, NS
  - This is what 20% of total project costs including a 10% return divided by 1 TWh will yield
- Note, with all generation and transmission project costs (including the Maritime Link) recovered in Block A and B, any additional sales over the link will not attract any generation or transmission tariff cost to Lingan.
  - i.e. land additional MF power over and above 1 TWh, at Lingan at $0 cost.
- Our alternative is to (note: very low probability of success) pay all project costs ourselves, and sell this 1 TWh directly to NS, NB, PEI, or NE. The expected netback price to Lingan would be in the *[$65-$90 MWh - TBD]*.
- We would be worse off, therefore, we should take the Emera offer for the 1 TWh

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Block A – NL

- We are in effect selling this block of power to the NL ratepayer for *[$160-$200 MWh - TBD]*, decreasing to *[$100-$140 MWh - TBD]* over time as more energy is consumed by NL, thereby reducing the unit cost
- This is less than the isolated island and other options, therefore we should proceed
- This selling price covers the other 80% of the full project cost in this scenario
- Note: How profits from Block C could be utilized to reduce this cost is yet to be determined

Block C – Remaining Power

- Emera has discussed two options to monetize this power
- Option 1 - Emera could purchase the power at a rate equivalent to what they would have to buy power for in the future (either import or build) as outlined in their generation plan. In the event the next best was gas (most likely scenario), they propose a discount which would be higher at higher gas prices and lower at lower gas prices.
- Option 2 – Emera would assist Nalcor in flowing some (or all?) of this power through to New Brunswick, PEI, and/or New England. This option is less developed and we need to discuss in more detail on Monday.
- Note that Nalcor cost to Lingan for Block C is $0 as all generation and transmission costs in NL and Maritime Route have been allocated to Blocks A and B. Anything we net back (revenue less cost) to Lingan is pure profit.

Block C – Remaining Power

- Nalcor has a third option, separate from Emera
- Option 3 – sell through PQ, utilizing remainder of existing recall booking plus non-firm transmission as available, coupled with water management interface with CF(L)Co. Anything we net at the NL/PQ border would be considered pure profit, as all generation and transmission costs in NL have been allocated to Blocks A and B.
- *Note, this would have to be considered a hostile route, with significant risk.*

- In either option 1, 2, or 3, the distribution of this added value could be applied to Gull Island, other investments, dividends to Shareholder, rate reduction to NL ratepayer or any combination of the above
  - This is a policy decision

Block C – Remaining Power

- The other alternative to the Maritime Link (assuming no near term satisfaction with respect to HQ OATT issues) is to seek an offer from PQ/HQ to give us a price at the border which would provide better returns and NPV to above scenarios.
- This option is not recommended at this time;
  - History has shown that PQ/HQ may initially accept such an advance, but then fail to close a reasonable deal.
  - There is high risk that such a delay tactic by PQ/HQ would result in lost opportunity with Nova Scotia, and put us back in the same situation as before. The probability of an Emera/Nova Scotia deal is growing at this point – it would be very difficult to pull back together in future if we leave it now.

NL Value Received for the 1TWh

- A sales price equivalent to cost plus return significantly greater than a market price we could achieve
- Transmission access to Lingan for $0 incremental cost for
  - Block C remaining power, PLUS
  - Any other Island generation developments, PLUS
  - Any other Labrador developments up to available Island link capacity
- Cost and schedule risk (not clear on any limitations yet) on 20% of total project cost shifted to Emera/NSPI and NS
- $1.2B to $1.5B of financing absorbed by Emera
- Reliability of NL electrical system significantly increased

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NL Value Received for the 1TWh

- Opportunity to optimize the full value of our hydraulic resources through NL through arbitrage in multiple markets, and utilizing water management
- We have established another route to monetize MF spill, including any planned Island load growth that does not materialize
- Established strategic relationship with Emera for long term
- Helps get MF off the ground and provides the following added benefits
  - NL needs covered until 2041
  - NL essentially 100% renewable electricity generation
  - full re-call on Block C remaining power
  - Upper Churchill leverage

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NSPI/NS Value Received

- Avoidance of 100MW wind farm cost required in 2015-16, which could cost as much as $120-$160 MWh
- Enables NS to meet provincial 40% renewable target, if they get the 1.0 Twh from us, and buy the remaining requirement from our Block C remaining power
- Enables NS to meet the proposed Federal GHG regulations for coal fired generation
- Rate stability increased for a significant time period
- Increases and diversifies their supply sources
- Increase reliability in NS system
- Alternative to their next best firm generation needs

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Emera Value Proposition

- A quality asset and associated revenue stream, through NSPI
- Strategic long term partner for Emera – NL has significant development potential
  - Emera actively seeking additional investment opportunities
- Potential to grow the energy trading business with us

Communications Issues

- Rate increases to accommodate MF
  - MF is the most economic solution over time
  - Thermal generation would be a big part of our long term solution without MF
  - Rates would go much higher than MF over time with a thermal solution
  - This is the best solution for future generations
  - Provides a 99% GHG free solution for NL

Communications Issues

- Sales prices to Maritimes and through Quebec are lower than cost to NL consumers
  - MF is the most cost effective solution for NL needs over the long term, even without any outside sales
  - Any surplus energy sales will be based on available market prices elsewhere, and over time, market prices elsewhere are expected to exceed NL cost.
- Sales prices to Maritimes and through Quebec are lower than cost to NL consumers (Con't)
  - Even if shorter term sales prices elsewhere are lower than NL cost, we are still better to sell the energy, rather than spill the water, and get zero value

Clarification Questions for Monday

- What are the details of the option to flow through to Maritimes and NE?
- What is the seasonality and shape of the I TWh?
- What type of discount structure is under consideration?
- Are we aligned on the capital cost base to apply the 20%?
  - IDC?
  - Timing of expenditures?
  - Escalation assumptions?
  - Transmission losses?
- Distribution of emissions value?
- What are the tax implications of the deal for Emera?
- Role of NB and PEI?
- Implications of PPP funding?

Things we want ("Living List")

- Maximum achievable share of market based pricing
  - protect upside potential as much as possible
  - anchor to electricity markets, not gas markets
- Maximum flexibility
  - to take advantage of shape, load, demand and water management
  - to take non-firm through PQ at our discretion
  - to sell directly to NB, PEI and/or NE if we desire
- Transmission access to NB/NE/PEI using their existing capacity to the extent possible
- Sunset clause on 1 TWH, short as possible
- Maximum possible cost and schedule exposure to Emera on 20%
- Eternal access to existing link and replacements
  - They may require a pricing renewal clause, with arbitration, in exchange
- Provisions to enable increased capacity of the Maritime Link
- Rights to flow power back to NL
- Alignment of interests to extent possible to avoid predatory practices

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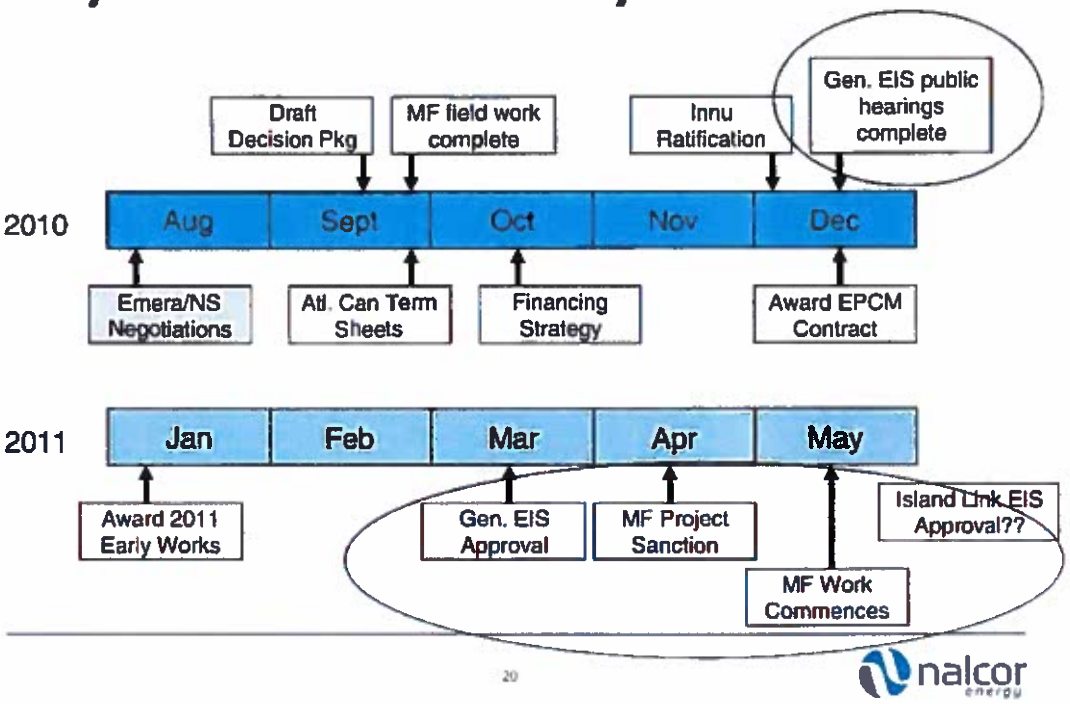
Suggested Next Steps

- August 30
  - Further discussions and clarification with Emera
  - Additional clarifications throughout the ensuing week
- September 3
  - Prepare 1st Draft Term Sheet for review internally with this NL group
  - Complete economic analysis, outlining key cases required for decision making
- September 7-10
  - Work with this group to ensure alignment prior to re-engaging to close with Emera
  - Discussions with Nova Scotia taking place at the same time
- September 25
  - Target - execute a term sheet

Key Milestones for May 2011 MF Start



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Cc: julia.dines, cobennett, Peter Hickman, Wayne Chamberlain, Bev Lane

Bcc: Kathy Winsor

From:	Audrey Brophy/NLHydro
To:	cathy.bennett@warp.nfld.net, g.shortall@rogers.com, ken.marshall@rci.rogers.com, tclift@mun.ca, Ed Martin/NLHydro@NLHydro
Cc:	julia.dines@rci.rogers.com, cobennett@bgoc.ca, Peter Hickman/NLHydro@NLHydro, Wayne Chamberlain/NLHydro@NLHydro, Bev Lane/NLHydro@NLHydro
Bcc:	Kathy Winsor/CRP/NLHydro@NLHydro

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Please dial-in as follows:

Toll Free # **1-888-241-3855**

Chairperson Code: (Wayne Chamberlain) **266-5352#**

Participant Code: **054-1590#**

Peter,
WC attended Mtg.

Thank you.
Audrey

Audrey Brophy
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Executive Leadership
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ATTACHMENT 2

33nd Nalcor Board Mtg
Nov. 10, 2010

Update on Negotiations with Emera

November 9, 2010

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Purpose

The purpose of this presentation is to:

- Discuss the distribution of cost risk for the project

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Background

- Decision 1 is to build Muskrat Falls and the Island Link for NL generation needs
- In this scenario , NL ratepayers and province takes 100% of cost risk for:
  - Muskrat Falls Generation Plant
  - Island Link
- The ratepayer absorbs the first tranche of "prudent" cost overrun with Nalcor/NL taking the next tranche

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Background (2)

- Decision 2 is to monetize the spilled water
- We have chosen to build a Maritime Link and make arrangements with Nova Scotia and Emera to purchase the electricity on commercial terms
  - 20% of electricity for 20% of costs
- NL wants to maintain control of the developments as they are 75/25 owner overall

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Cost Risk

- Muskrat Falls generation Plant
  - Nalcor owns 100%
  - Nalcor pays 100% of costs
  - Nalcor gets upside potential and downside potential in markets
  - NL ratepayers absorb a portion of "prudent" cost risk (2.0-3.9 TWh)
  - Nalcor absorbs subsequent cost overruns
- Island Link (Nalcor 75%, Emera 25%)
  - Nalcor pays 75% of costs, Emera pays 25%
  - In exchange for 25% investment, Emera will provide transmission rights in NS, NB and New England

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Cost Risk

- Island Link (cont'd)
  - Without these rights, Nalcor could not afford to flow to market
    - transmission upgrades are expensive
    - Emera takes full cost risk in providing these transmission rights
      - » "back-ups" provided
  - NL ratepayer takes 100% of first tranche of "prudent" cost overruns
  - Nalcor takes 100% of subsequent cost overruns
    - in exchange for Emera taking transmission cost risk
  - Nalcor was taking 100% cost risk in Decision 1 in any event

Maritime Link

- Emera owns 100%
  - Ownership returns to Nalcor after 35 years
- Emera pays 100% of costs
- In exchange:
  - Nalcor provides 0.98 TWh to NS ratepayer (equates to ~ $125 LUEC)
  - Nalcor gets all transmission capacity for $0 tariff
  - Nalcor receives ownership of ML after 35 years
- NS ratepayer will only pay up to the cost of a renewable alternative
  - good price for the power
  - Likely capped after a certain point, although NS ratepayer will absorb 100% cost overrun for "prudent" costs up to some unknown limit; maybe 10% - 15%

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Maritime Link (cont'd)

- NL/Nalcor want s to retain "Go/No-Go" decision on ML, in event cost overruns are not covered by NS ratepayer
- Three points of cost risk decision presented, two agreed;
  - Point #1 at UARB initial approval 6 months prior
  - Point #2 at project sanction Q3 2013
  - Point #3 during or at end of construction
    (major capital invested; completion is a must)

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Points #1 - #2

- If some costs in the cost overrun are not approved by the UARB
  - Emera has a right to absorb the costs and continue
  - If Emera chooses not to cover the additional costs, then Nalcor has the "Go/No-Go" decision
    - If Nalcor chooses to absorb the cost overrun, then Emera is out of ML, Nalcor assumes ownership, and ML proceeds. NS to give Nalcor PPA equivalent to approved costs. Emera retains Island Link transmission investment and Nalcor maintains NS, NB and New England transmission rights
    - If Nalcor chooses not to absorb the cost increase, and decides not to proceed with ML, Emera looses Island Link investments and ML. Nalcor back to MF, Island Link and spill.

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Point #3

- Emera decides to continue at sanction
- Emera has invested significant capital and cannot "walk away"
- Construction costs are overrun
- NS ratepayer has picked up some of the cost overrun, but some remains
- ***How are such costs handled?***
  - Nalcor's position is that Emera absorbs the extra costs not covered by NS ratepayer
  - This is unacceptable to Emera
    - In order to cover costs they want control over the ML project
    - In this scenario it's too late to say "Go/No-Go"
    - Even so, they are prepared to accept a certain amount of risk in this scenario

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Point #3

- Why should Nalcor agree to share cost risk in this case:
  - We want the full package deal with Emera and Nova Scotia
    - Price for 0.98 TWh is attractive
    - Emera brings access to Maritime and NE market which only they can provide at a costs that works for Nalcor
      - » Emera is assuming risk on transmission
  - Once we have come this far, we want to encourage completion
  - We want Emera's $1.8 billion capital investment
  - Nalcor has 80% of the power for sale
  - Nalcor retains "Go/No-Go Decision"
  - First tranche is still handled by NS ratepayer

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Elements of Maritime Link and Risk

	MM $ Cdn (includes 15% contingency)	Risk
Converter Stations (2)	$500	Lower
Cable	$300	Lower
Installation (incl. weather risk)	$200	Higher
Overhead Lines	$200	Lower
Total	$1,200	

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Proposed Cost Overrun Risk Sharing

% Over-runs	Option 1	Option 2	Option 3	Option 4
0 -15 %	Contingency	Contingency	Contingency	Contingency
15 – 25 %	NS Rate Payers	NS Rate Payers	NS Rate Payers	NS Rate Payers
25 -30%	100 % Emera	75 % Emera / 25% Nalcor	75 % Emera 25% Nalcor	50 % Emera / 50% Nalcor
30 -35 %	75% Emera / 25% Nalcor	75% Emera / 25% Nalcor	50% Emera / 50% Nalcor	50% Emera / 50% Nalcor
35 – 40%	50% Emera / 50% Nalcor	50% Emera / 50% Nalcor	50% Emera / 50% Nalcor	25% Emera / 75% Nalcor
40 – 45%	25% Emera / 75% Nalcor	25% Emera / 75% Nalcor	25% Emera / 75% Nalcor	25% Emera / 75% Nalcor
45% +	10% Emera / 90% Nalcor	10% Emera / 90% Nalcor	10% Emera / 90% Nalcor	10% Emera / 90% Nalcor

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Pros and Cons of Risk Sharing Structure

- Pros
  - Graduated sharing of risk but Nalcor still holds the "Go/ No-Go decision" at sanction
  - Emera to take 100% of first tier-higher probability overruns, Nalcor bearing higher % of lower probability overruns;
  - Best solution now – (greater leverage now).
- Cons
  - Nalcor will need to give Emera participation / control in decision-making for ML.
  - Emera's risk tolerance, may not exceed 10% (~ $120 M) therefore, may need to scale back the tiers.

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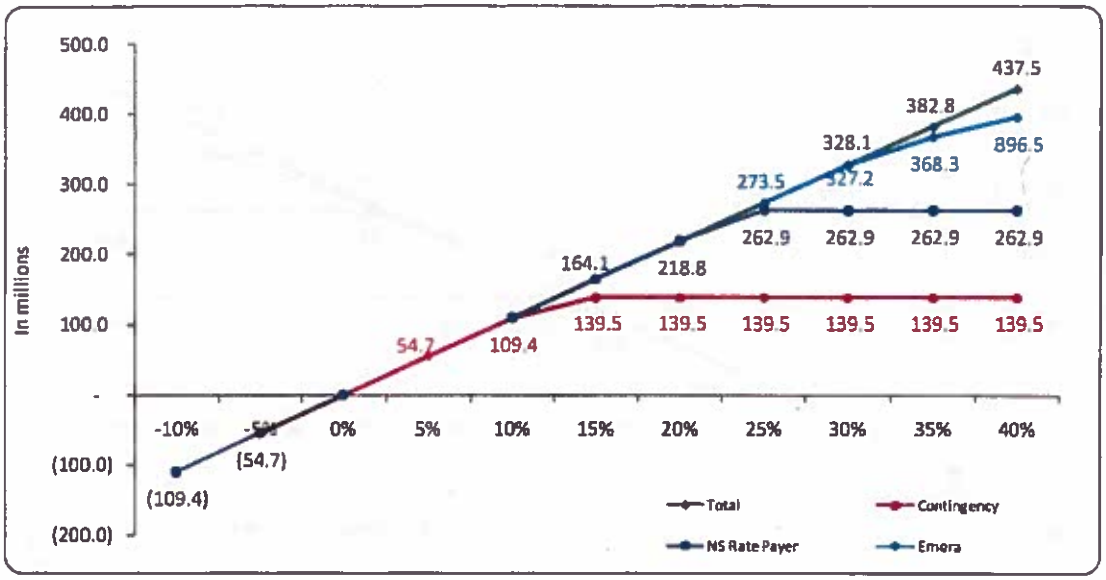

First ~15% = contingency
Next 10% = NS rate payer
Next 5% = 100% Emera / 0% Nalcor
Next 5% = 75% Emera / 25% Nalcor
Next 5% = 50% Emera / 50% Nalcor
Next 5% = 25% Emera / 75% Nalcor
Thereafter = 10% Emera / 90% Nalcor

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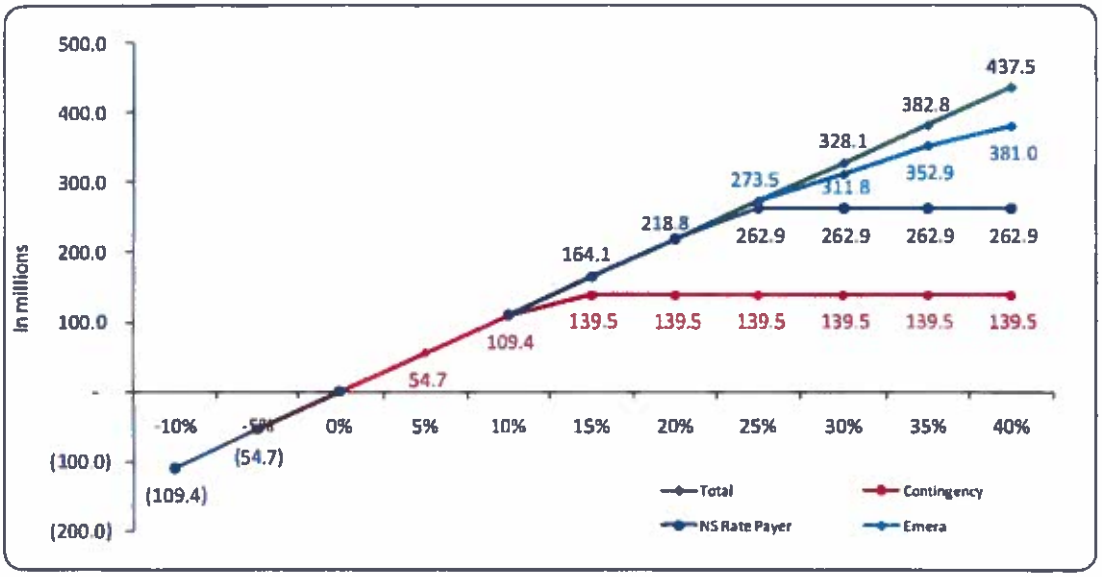

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Next 5% = 25% Emera / 75% Nalcor

Thereafter = 10% Emera / 90% Nalcor

OPTION #2

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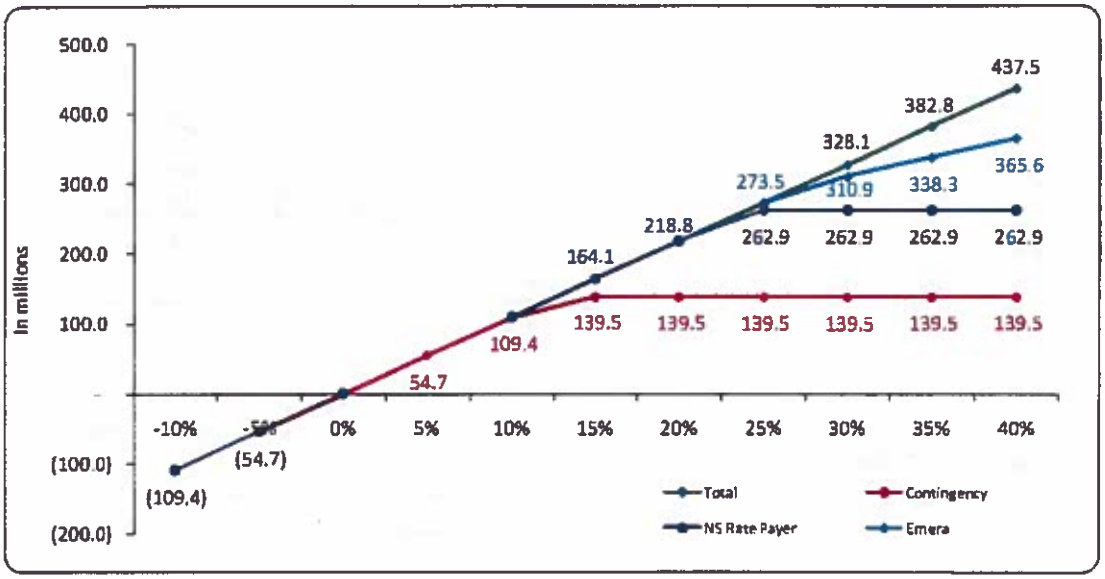

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Next 5% = 25% Emera / 75% Nalcor

Thereafter = 10% Emera / 90% Nalcor

OPTION #3

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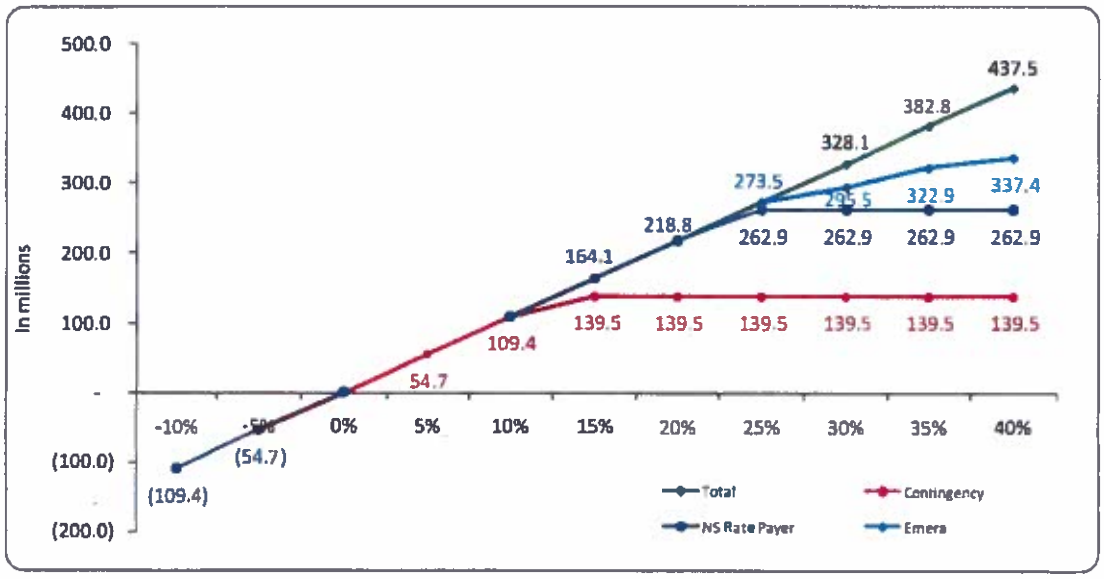

First ~15% = contingency **OPTION #4**

Next 10% = NS rate payer

Next 5% = 50% Emera / 50% Nalcor

Next 5% = 50% Emera / 50% Nalcor

Next 5% = 25% Emera / 75% Nalcor

Next 5% = 25% Emera / 75% Nalcor

Thereafter = 10% Emera / 90% Nalcor

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Presentation to Board of Directors
Update on Negotiations with Emera

November 10, 2010

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Purpose

The purpose of this presentation is to:

- Summarize current Nalcor/Emera negotiations status

Summary

- Generation Expansion
  - A decision is required on a next generation sources to meet Island demand
  - Muskrat Falls with an Island Link is the preferred option
  - This analysis assumes that significant water will be spilled and not utilized (flow over the dam)
- Maximizing Value of Spilled Water
  - The objective then becomes how to best obtain value for the spilled water
  - There are opportunities to maximize this value

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Maximizing Value of Spilled Water

- Options considered:
  - Sales to HQ OR export through QC
  - Arrangements with Emera to sell power in NS at a favorable rate and achieve access through NS to NB, PEI and New England
    - Nalcor will subsequently explore sales arrangements with NB Power, PEI and New England
    - Maintains ability to deal directly with NB and PEI on power sales
  - Go it alone on export transmission investments

- The preferred option is to conclude arrangements with Emera to sell power in NS at a favorable rate and achieve access through NS to NB, PEI and New England

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Generation Expansion Summary

- Generation
  - Muskrat Falls — 824MW (4.9 TWh/yr)
  - Construction start — 2011
  - In-service — 2016
  - Capex — $3.0 billion
- Island Link
  - HVDC link (MF to Soldier's Pond) — 1100 km
  - DC converter stations
  - Capacity — 900 MW
  - Capex — $2.1 billion

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Maximizing Value of Spilled Water

- Maritime Link
  - New transmission and upgrades on the Island
  - DC converter stations
  - HVDC line to Cape Breton — 180 km
  - Capacity — 500 MW
  - Capex — $1.2 billion

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LABRADOR
Churchill Falls
Muskrat Falls
Gull Island
QUEBEC
NEWFOUNDLAND
St. John's
ONTARIO
CANADA
P.E.I.
NEW BRUNSWICK
NOVA SCOTIA
MAINE
Montreal
Ottawa
Atlantic Ocean
VERMONT
NEW HAMPSHIRE
Boston
NEW YORK
MASSACHUSETTS
CONNECTICUT
New York
PENNSYLVANIA
UNITED STATES

Scandinavia: Leaders in Sub-Sea Technology

- **NorNed** (2007) – connects Norway & Netherlands, 450kV, 700MW, 580km
- **SwePol** (1999) – connects Sweden & Poland, 450kV, 600MW, 245km
- **Baltic Cable** (1994) – connects Germany & Sweden, 450kV, 600MW, 250km
- **Skagerrak** (1977) – connects Norway & Sweden, 250kV, 1000MW, 127km
- **Konti-Scan** (1965) – connects Sweden & West Denmark, 250kV, 250MW, 86km

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Summary

- Nalcor builds and owns 100% of MF
- Nalcor builds Island Link and has ownership of 75%
  - Ability to take 100% at our option
  - Opportunity to invest in other Emera projects
- Emera builds and owns Maritime Link 100%
  - Ownership reverts to Nalcor after 35 years
- Nalcor always retains at least 51% controlling interest in overall transmission system
- NL gets favorable sales arrangements to NS access to NS transmission through to NB, PEI and NE
  - System coordination in NS
  - Bayside transmission rights in NB
  - MEPCO rights in Maine
- Nalcor has decision making control on all elements of the project
- NL power needs met until 2041
- NL is >98% renewable from an electrical generation perspective
- Project will generate a return of > 9% IRR

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Cost Risk Sharing on Maritime Link

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Safety Moment

Step Back 5X5:

1. THINK through the task
2. LOOK for hazards
3. ASSESS the risk(s)
4. MAKE required changes
5. DO the task safely

HydroSafety.ca

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Purpose

- Outline proposal and rational regarding how cost risk and associated governance could work on the Maritime Link

Setting the Stage

- What would Nalcor want if Emera has full control but Nalcor has the full cost risk?
  1. Assurance and knowledge as to when the line will be ready
  2. Interface coordination among the other components of the project and the system planners in NL and NS
  3. Assurance that reliability, quality, cost, schedule and execution processes are robust and best practice.
  4. Ability to influence the elements listed in 3 above
  5. Ability to withdraw from the project if risk profile not acceptable
  6. Ability to decide if project is a go/no go prior to committing at sanction
     - Sole risk provisions apply

Principles

- Degree of influence, input and information drives level of cost risk assumed
  - More influence, input and information enables assumption of more risk
  - Less influence, input and information results in assumption of less risk
- Once the Maritime Link is under construction, speed of decision making is a critical component of cost control, as a delayed decision will result in a time delay. A time delay leads directly to increased costs, particularly in installation and lead time.
- The entity which stands to gain or lose the most on the overall project, should have the ability to "tie-break" if necessary, as they are assuming the greater proportion of the risk.
- It is not appropriate to shift "tie-break" decision making to a 3rd Part as such a party would not have a stake in the game. The parties who bear the risk need to retain control of the decision.
- It is important to decide how risk should be shared when leverage of both parties is the most similar.
- Party which takes more greater cost risk on the high side should absorb less cost risk on the lower side

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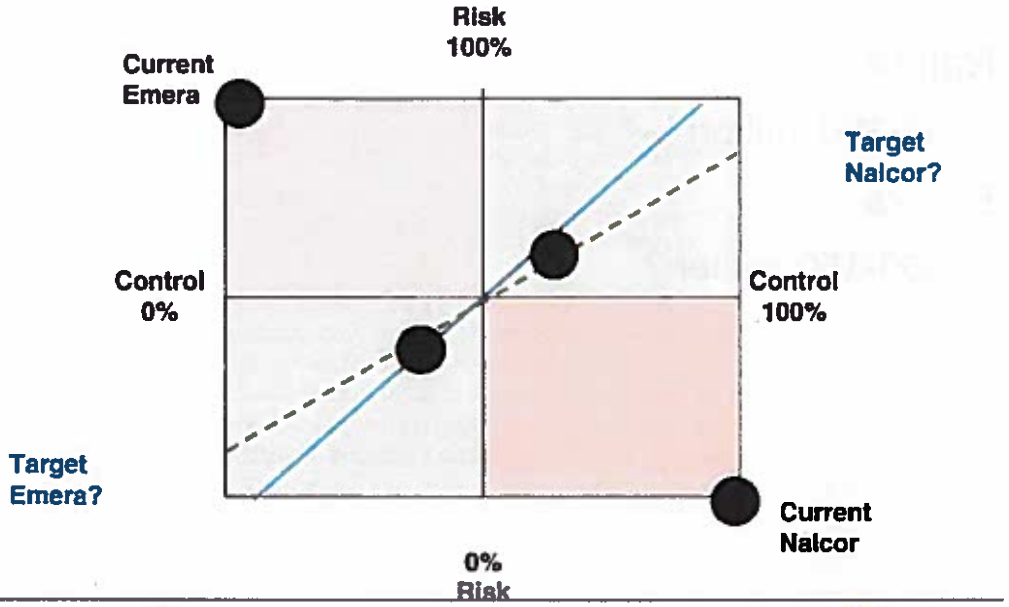
The Control/Risk Sharing Matrix



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Target Levels of Maritime Link Risk

- Nalcor
  - 60-150 million?
- Emera
  - $60-150 million?

Control Processes

- There are 3 processes which establish level of control
  - Which party is executing the ongoing project execution processes
  - Voting protocol on key decisions
  - Audit Rights

Project Execution Processes

- Emera secondee(s) in the Maritime Link Owner Project Team, 50-50 Emera/Nalcor project team, with Maritime Link Project Manager from Emera, if available, reporting to Overall Project Manager
- Joint Development Committee with Joint Chairs, with technical reps from both companies
- Joint Development Committee jointly recommends, with sign of from both chairs and ML Project Manager and Project Manager
- Duration from present to one year after in-service

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Voting Protocol on Key Decisions

- Decisions to be made jointly, with consensus of both chairs
- In event consensus not achieved, CEO's of both companies tasked with achieving consensus
- In event of a tie, Nalcor has tie-breaking vote
- Costs of review teams borne by each company

Key Decisions

- Decisions made prior to sanction
  - Scope
  - Basis of design
  - Project Execution Plan
  - Labour Strategy and Project Labour Agreements
    - In context of overall project
  - Contracting Strategy
  - EPC Contract bid review and award process
  - Environmental Assessment Strategy
  - Pre-sanction budget

Key Decisions

- Decisions made at Sanction
  - Process exists for Emera to not proceed at sanction, and for Nalcor to retain go/no go decision (i.e. sole risk)
  - Therefore Emera has the ability to not accept the following decisions, and therefore have ability to strongly influence, or withdraw
    - AFE and cash flow approval
    - Award of EPC contract (construction)
    - Project Scope

Key Decisions

- Decisions made after Sanction
  - Approval of the Annual Development Budget for Maritime Link
  - Changes in Project Scope, only to the extent to meet the needs of the Term Sheet
  - Cost Overrun Management

Audit Rights

- Full Audit Rights for both parties
  - Financial
  - Technical

ATTACHMENT 3

LCP Cases as of Nov 16 2010			
	Stand Alone - Spill	Stand Alone - Sales West & Spill	Emera Reference
PWC Scenario #	245-1	246-1	247-1
	Muskrat + Island HVdc with remainder spilled	Muskrat + Island HVdc, Sales west via residual recall booking, with remainder spilled	Muskrat + Island HVdc, Emera funds Milnk for 1 TWH, Remainder portfolio as per CK model
Summary Economics			
Dividends (50 years, $MM)	$29,842	$31,627	$29,316
NPV - 12% - January 1, 2010 ($MM)	($780)	($587)	($587)
NPV - 7.5% - January 1, 2010 ($MM)	$527	$927	$813
Equity IRR (%)	8.4%	9.3%	9.2%

Notes:
1. Underlying capex reflects 15% contingency. Dividends and financial indicators reflect Muskrat Falls and Island Hvdc.
2. EMERA/NSP Reference cases assume Emera's contribution funds Milnk.
3. EMERA/NSP to receive 1 TWh of generation plus supplemental energy for 35 year term in return for capital/equity/terminal value.
IE/Nalcor Nov 16, 2010

From:
Nalcor Board of Director
Nov. 16, 2010
Board Papers

Addendum to October 29, 2019 Submission

Dated: December 13, 2019

Subsequent to drafting its October 29, 2019 submission "Re: Natural Resources Response to Commission Questions", the Department identified that the Muskrat Falls Oversight Committee was aware of the November 2, 2016 Independent Engineer's report entitled, "Meetings in St. John's and Visits to Lower Churchill Project Sites, July 11 to 15, 2016 prepared for Natural Resources Canada and Nalcor Energy. Consequently, the Department would have been aware of that report through its participation on that Committee. In its report, the Independent Engineer discusses North Spur field notes and materials excavation including North Spur site staff observations that the amount of high sensitive clays encountered to date were less than expected, it was agreed that geological mapping of surficial geology and soil mechanics related features would be done in the future.

As noted in NR's October 29, 2019 submission, Nalcor's December 2, 2016 letter states, "As-built or record drawings/documents are typically completed after a work scope is completed, and informed by data collected during the construction process." Nalcor subsequently advised NR that Nalcor's geotechnical engineers' and geologists' field notes recorded during the construction of the North Spur Stabilization works have been incorporated into the SNC-Lavalin "North Spur Stabilization Works - Construction Report" (SNC. 07-Sep-20 18, approved 27-Jan-20 19), which is the complete As-Built document for the North Spur.