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LCP Cost & Schedule Briefing for Canada-IE June 7 2016.pdf

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You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?

# Lower Churchill Project

## Government of Canada / Independent Engineer Briefing Document

Boundless Energy



June 2016

# Contents

- LCP safety focus and achievement
- LCP project background
- Current project status
- Key risks to project completion
- Current cost and schedule outlook, including risk exposure
- Path forward

# LCP safety performance is among the best in NL

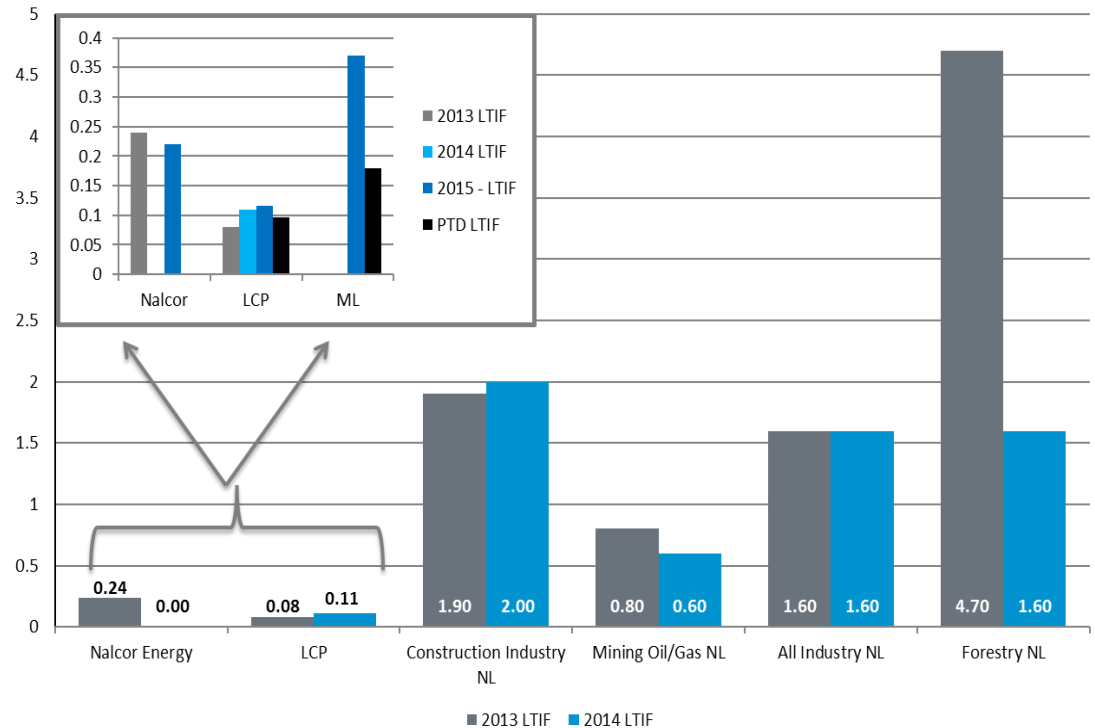
## LCP safety beliefs

- We believe all incidents are preventable and an incident-free workplace is both achievable and sustainable
- Safety and productivity go hand-in-hand
- LCP has a reputation of being a safe place to work
- ~20 million person-hours worked to date with 11 contractor LTIs - all have returned to work
- Nalcor's safety culture has taken a foothold across the project, evident by positive indicators project-wide (e.g., worker engagement, behaviors and attitudes)

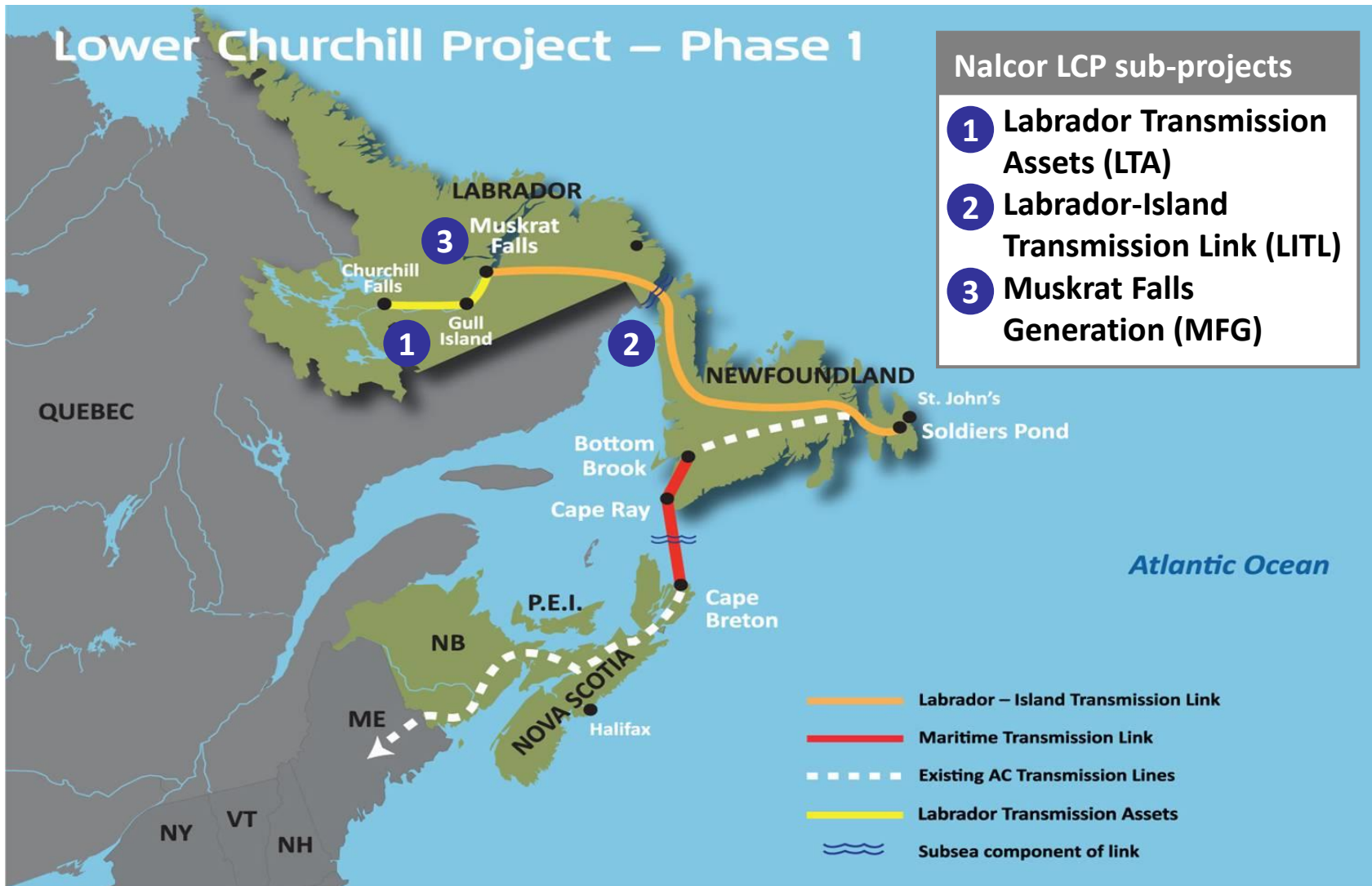
## Safety performance comparison

### Lost time incident factor (LTIF)

LTIF \* 200,000 / # of hours worked in the period



# Nalcor portion of LCP consists of 3 sub-projects

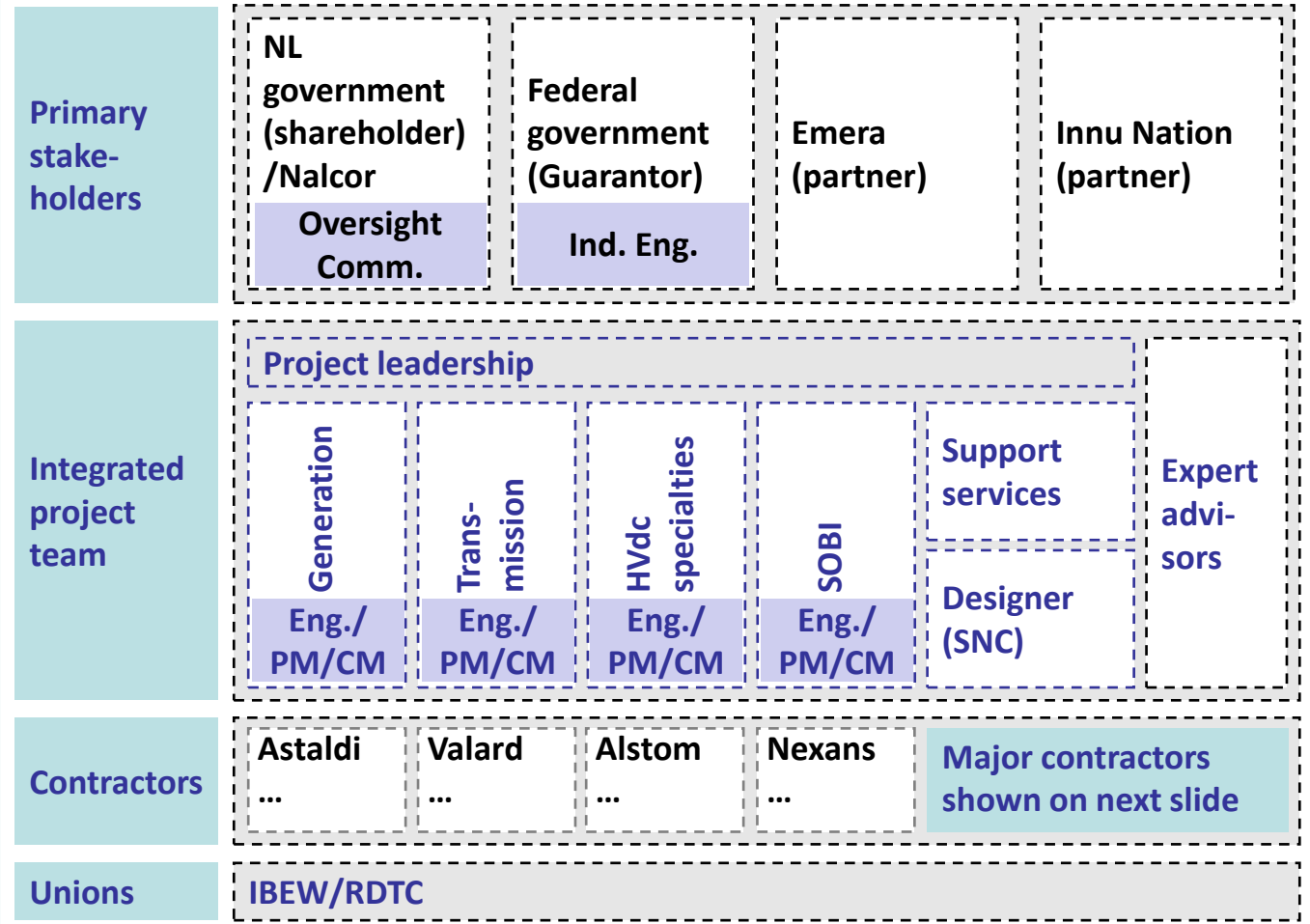


# Owner's team includes design, procurement, and construction management roles

## Details of Owner's team

- LCP is managed by an integrated project team concept to manage the many stakeholders, contractors, and geographical dispersion of the work
- Organization model designed to reflect execution and contracting strategy. Model supported by Independent Eng. and IPA
- The project team is staffed with a mix of Nalcor personnel, consultants, staffing agencies, and engineering companies (e.g., SNC, Hatch)

## Owner's team is organized to manage contractors and interface with stakeholders



# Contract approach is toward larger scopes that use fixed-pricing to the extent practical

Active LCP contractors with scopes >C\$100 million account for ~67% of current AFE

	Name	Value <sup>1</sup> (C\$M)	Scope	Contract type
LTA	▪ Valard	270	T-line construction AC	Unit-rate installation contract
	▪ Alstom	210	CF/MF switchyards	Lump sum EPC
LITL	▪ Valard	890	T-line construction DC	Unit-rate installation contract
	▪ Alstom	740	Switchyards, converter stations, synchronous condensers	Lump sum EPC
	▪ Multiple	400	Clearing and access	50% unit-rate/lump sum, 50% reimbursable
	▪ Nexans	150	Subsea cable	Lump sum EPC
MFG	▪ Astaldi	1,140	Powerhouse, intake, and spillway, transition dams	Labor capped target-price /non-labor unit-rate
	▪ Andritz	440	Turbines, generators, and gates	Lump sum EPC
	▪ Barnard Pennecon	290	Dams	Non-labor unit-rate/reimbursable labor
	▪ TBD	210 <sup>2</sup>	Balance of plant	TBD
	▪ Gilbert	140	North Spur stabilization	Reimbursable
	▪ Johnsons	130	Reservoir clearing	Lump sum

1 Approximate budget value 2 AFE value equal to ~\$156 million. \$50 million of AFE contingency is reserved for the difference

# Although behind plan, MFG is now progressing at expected pace; LITL opportunities under evaluation

■ To date ■ Remaining ■ Approved schedule

Project phase	Progress	Details on progress to date	Details on 2016 progress
Engineering	Substantially complete	<ul style="list-style-type: none"> <li>Detail design 100% complete</li> </ul>	<ul style="list-style-type: none"> <li>Follow-on engineering support</li> </ul>
Procurement	Substantially complete	<ul style="list-style-type: none"> <li>Major equipment manufactured or in final stages</li> </ul>	<ul style="list-style-type: none"> <li>All major equipment manufactured and onsite</li> </ul>
Construction overall		<ul style="list-style-type: none"> <li>All work-fronts open</li> <li>50-60 active work-fronts within province across 1350 km</li> </ul>	<ul style="list-style-type: none"> <li>Beginning to close work-fronts</li> <li>Labrador T-lines complete</li> <li>SOBI complete</li> </ul>
Construction	LTA	<ul style="list-style-type: none"> <li>Clearing and access complete</li> <li>All foundations/towers installed</li> <li>Stringing 98% complete</li> <li>Switchyards 40% complete</li> </ul>	<ul style="list-style-type: none"> <li>Stringing complete by Q2 2016</li> <li>Switchyards substantially complete</li> </ul>
	LITL	<ul style="list-style-type: none"> <li>Clearing and access 75% complete</li> <li>T-line 55% complete for Labrador</li> <li>Conv. stations/transition compounds 18% complete</li> <li>Switchyards and synch. cond. 36% complete</li> </ul>	<ul style="list-style-type: none"> <li>Clearing and access complete</li> <li>T-line complete for Labrador</li> <li>Switchyards and sync. cond. substantially complete</li> <li>HVdc Converter Stations 70% complete</li> <li>SOBI cables installed</li> </ul>
	MFG	<ul style="list-style-type: none"> <li>Bulk excavation and infra. complete</li> <li>Primary spillway structure complete, powerhouse 24% complete, North Spur 44% complete</li> <li>Dam construction underway</li> </ul>	<ul style="list-style-type: none"> <li>Powerhouse concrete ~ 55% complete (Astaldi target of 130,000 m³ of concrete installed for year)</li> <li>River diversion</li> <li>Reservoir preparations complete</li> <li>North Spur nearing completion</li> </ul>



# Work is progressing on all fronts – LTA/LITL

**Lower Churchill Project – Phase 1**

**Key**

- 1 Churchill Falls AC substation
- 2 Muskrat Falls AC substation
- 3 HVac last tower erection
- 4 HVac line
- 5 SOBI subsea cable
- 6 MF converter station
- 7 Stringing operations
- 8 Soldiers Pond synchronous condenser
- 9 Soldiers Pond converter station

6

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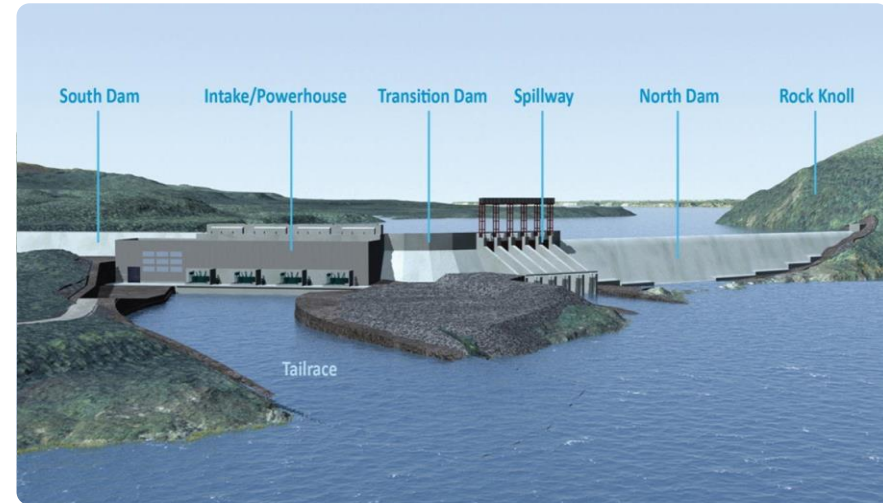
4

3

2

1

# Work is progressing on all fronts - MFG



## Key

- 1 North dam – starter groin
- 2 North Spur
- 3 Temporary spillway bridge
- 4 TG Factory Acceptance Test (FAT)
- 5 TG ready for shipment
- 6 Powerhouse
- 7 Transition dam
- 8 Spillway
- 9 Separation wall

# While project risks are understood and being managed, issues remain

Additional detail on next slides

	<u>Key risks</u>	<u>Impact</u>	<u>Mitigations</u>
LTA/LITL	▪ Access for T-lines	▪ Cost	▪ Aggressive procurement to limit impact (benefit of increased reliability access)
	▪ Contractor performance issues (e.g., Valard and Alstom)	▪ Mostly schedule, some cost	▪ Early engagement of contractor team and leadership ▪ Increased LCP oversight
MFG	▪ Astaldi ability/willingness to complete scope	▪ Cost and schedule	▪ Negotiate path forward, limiting Nalcor’s exposure to the extent possible
	▪ Astaldi performance issues	▪ Cost and schedule	▪ Ensure performance meets plan in the short-term; long-term mitigation linked to negotiation
	▪ Other contractor performance issues (e.g., Andritz)	▪ Cost and schedule	▪ Continue to ensure performance meets plan ▪ Early contractor engagement if issues arise ▪ Increased LCP oversight
All projects (LCP wide)	▪ Public nature of the project	▪ Cost and schedule	▪ Work with stakeholders to clearly define decision-making path (e.g., Astaldi negotiations)
	▪ Project integration/operational readiness	▪ Delayed start-up	▪ Planning and hiring begun for integration and operations roles

**Astaldi**

# Three important points must be considered with respect to Astaldi

## Astaldi is experiencing financial challenges

- Astaldi has not delivered against their bid expectations
- In addition, initial plan wasn't achieved, and a year of schedule was lost
- Current performance is consistent with industry standards, as analyzed by external advisors
  - Experienced and functioning project team is in place
  - 2015 installation rates exceeded expectations

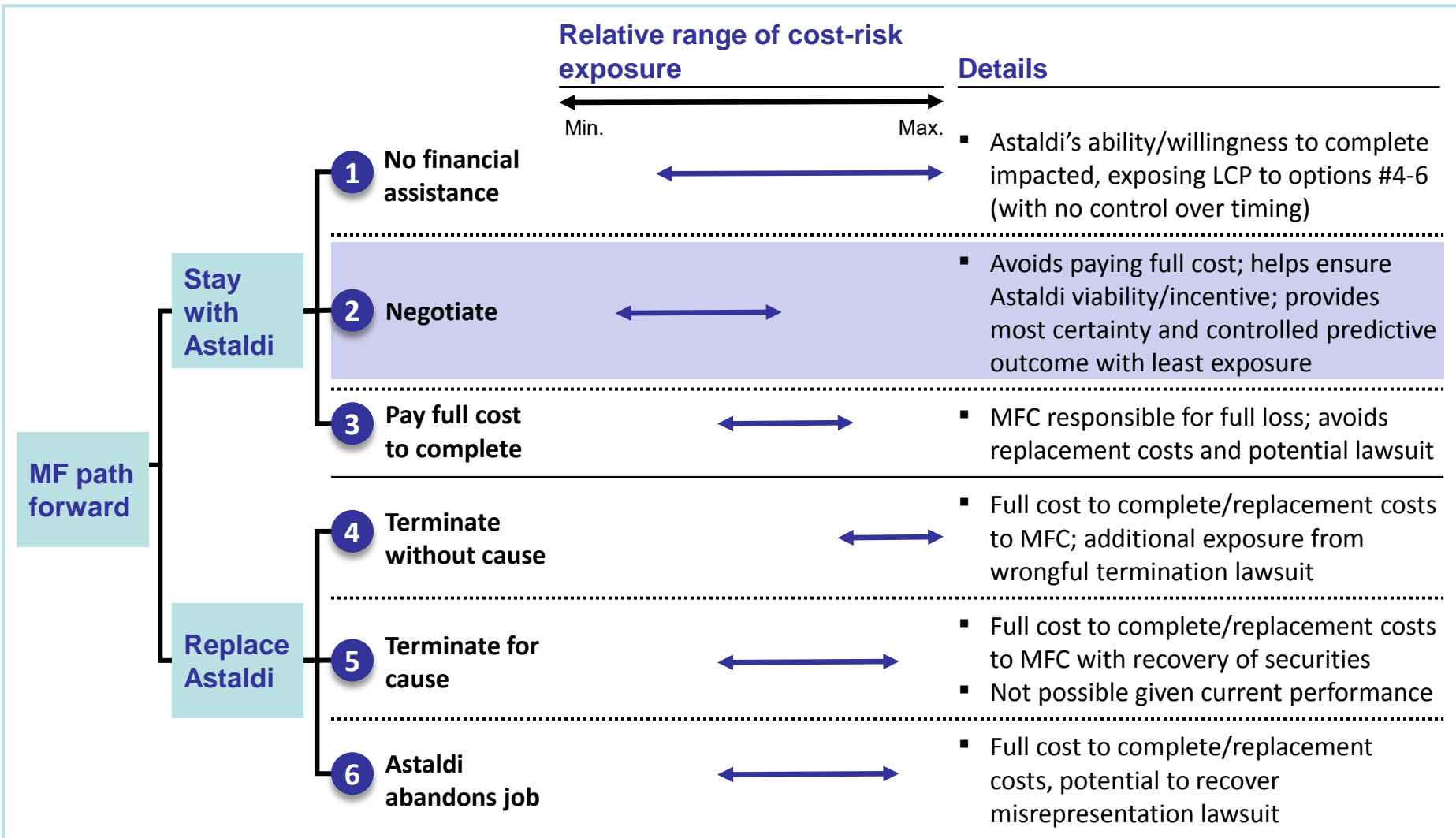
- Astaldi has potentially material liquidity issues, due to covenants, as analyzed by external advisors
- Astaldi's credit rating outlook was downgraded by S&P and Moody's to "B+ negative", and HSBC dropped Astaldi Canada's line of credit
- Share price has fallen from 11 EUR to ~4 EUR in the last ~9 months
- The value of parent company guarantees may be questionable given the creditworthiness of Astaldi as a counterparty

## Terminating Astaldi has significant risks

- Termination for cause is likely to be successfully challenged
- There is a significant cost associated with disruption of continuity/replacement, including loss of personnel and loss of or damage to equipment

# What we shared with the Govt.: Negotiating with Astaldi provides the least cost-risk exposure

Preferred option



# Where we are today: Significantly improved concrete production and a solid foundation in place for summer construction season; commercial negotiations on hold

## Current performance

- **2015 production exceeded external advisor expectations** – ~123,000 m<sup>3</sup> vs. ~110,000 m<sup>3</sup>
- **2015/2016 winter construction program, including removal of ICS structure, proceeded as scheduled**
- **2016 production has proceeded as planned, commercial positions hardening**

## Next steps and key dates with Astaldi

### Details

#### Next steps

- Reach internal agreement on path forward with Astaldi
- Obtain mandate for next steps
- Respond to Astaldi’s justification for incremental compensation
- Reach final agreement


#### Key dates


- 
- July – Contract labor cap (LMAX) reached
  - June 30 – Astaldi auditor deadline set for resolution of MFG and covenant calculation
  - August – Astaldi arrives at cash flow cliff


# Cost and Schedule Quantitative Risk Analysis






















































# Cost and schedule risk exposure centers on specific scopes

 Projected cost within +/- 10% of current AFE<sup>1</sup> or meeting approved schedule

 Risk of going outside +/- 10% of current AFE or beyond approved schedule

 Projected cost outside +/- 10% of current AFE or beyond approved schedule

	Latest AFE C\$ Billions	Scheduled complete	Status		Contractor	Latest AFE C\$ Millions	Status	
			Cost	Schedule			Cost	Schedule
LTA	0.88	Sept. 2017			Valard	 270		
					Alstom	 210		
					Balance of scope	 400		
LITL	3.09	Sept. 2017			Valard	 890		
					Alstom	 740		
					Clearing and access	 400		
					Nexans	 150		
					Balance of scope	 910		
MFG	3.66	Dec. 2017			Astaldi	 1,140		
					Andritz	 440		
					Barnard	 290		
					BOP (TBD)	 210		
					Gilbert	 140		
					Johnson	 130		
					Balance of scope	 1,310		
<b>Total</b>	<b>7.65</b>							

1 Exposures within mega-project industry  
LOWER CHURCHILL PROJECT

# Risk exposure for LTA/LITL ~C\$150-300 million (~10%) above AFE, and ~3-7 months behind schedule for first power

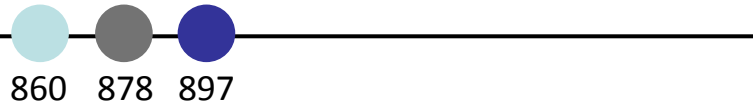
● Current AFE / sanction schedule    ● Bottom of Predictive Range (P25)    ● Top of Predictive Range (P75)

## Range of outcomes

## Details

### Cost for LTA

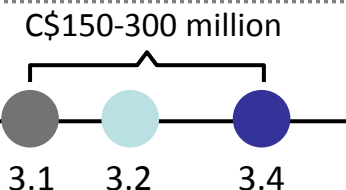
C\$ Millions



- The current AFE of C\$878 million is within the predictive range

### Cost for LITL

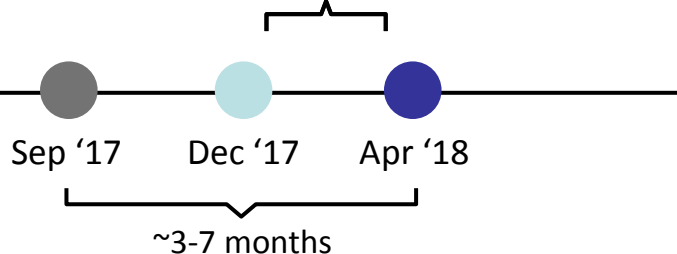
C\$ Billions



- Risk exposure beyond the AFE Rev.2 is C\$150-300 million (~10% over current AFE), largely driven by transmission line access and schedule delay

### Schedule for first power transfer

Winter Peak Period



- The HVdc Transmission Line (TL), Muskrat Falls (MF) Converter, and Churchill Falls (CF) Switchyard (key elements of the LTA/LITL transmission system) are driving the timeline to completion
- Achieving first power transfer in 2017 is within the predictive range, albeit toward the lower end (P25)

# Risk exposure for MFG ~C\$800-C\$1,100 million (~25-30%) above AFE with Astaldi deal, exposure greater if no deal reached

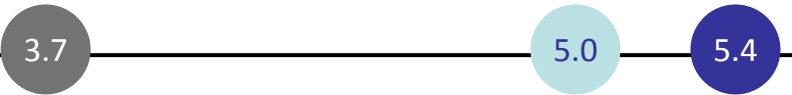
● Current AFE ● Bottom of Predictive Range (P25) ● Top of Predictive Range (P75)

## Range of cost outcomes

## Details

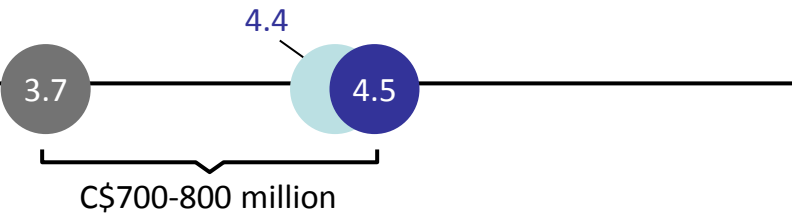
No negotiated agreement with Astaldi

C\$, Billions



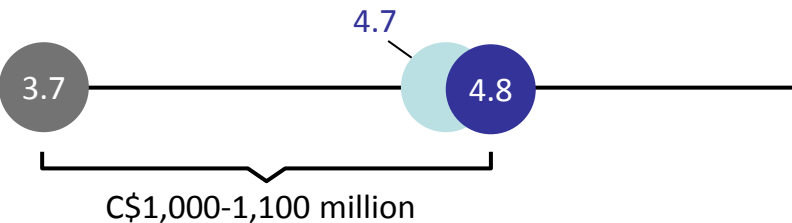
- Exposure driven by Astaldi's performance and the impact on schedule and other contractors
- Additional exposure due to the potential of having to implement a replacement contractor

Agreement with Astaldi and C\$200 million Nalcor contribution



- Negotiation with Astaldi provides greater certainty in outcome as several cost-risks are reduced, which include avoiding potential replacement costs, limiting further schedule delay, and ensuring concrete production in-line with recent Astaldi performance
- Negotiation scenarios assume that Astaldi is able to absorb the remaining loss (beyond that of the Nalcor contribution)

Agreement with Astaldi and C\$500 million Nalcor contribution



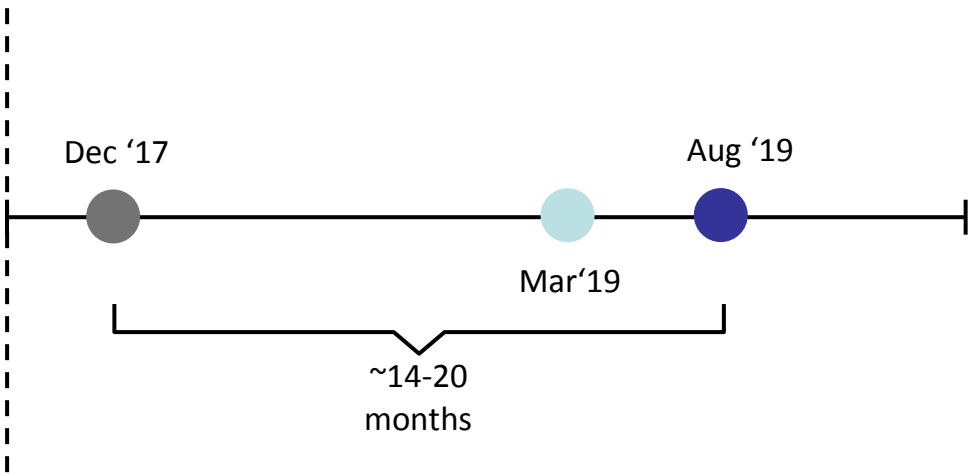
# First power generation is ~14-20 months behind the sanction schedule, greater delay possible with no Astaldi deal

● Sanction schedule ● Bottom of Predictive Range (P25) ● Top of Predictive Range (P75)

## Range of cost outcomes

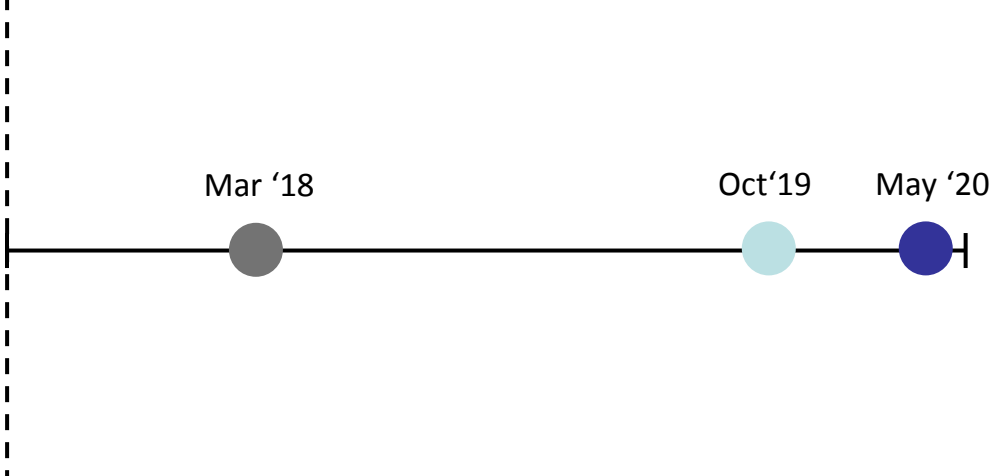
## Details

Schedule for first power generation (negotiated agreement with Astaldi)



- Sanction target aggressive and not reflective of productivity challenges
- Slow ramp-up by Astaldi resulted in unrecoverable time that is impacting MFG's other contractors
- Potential for even greater delay if no deal is reached with Astaldi

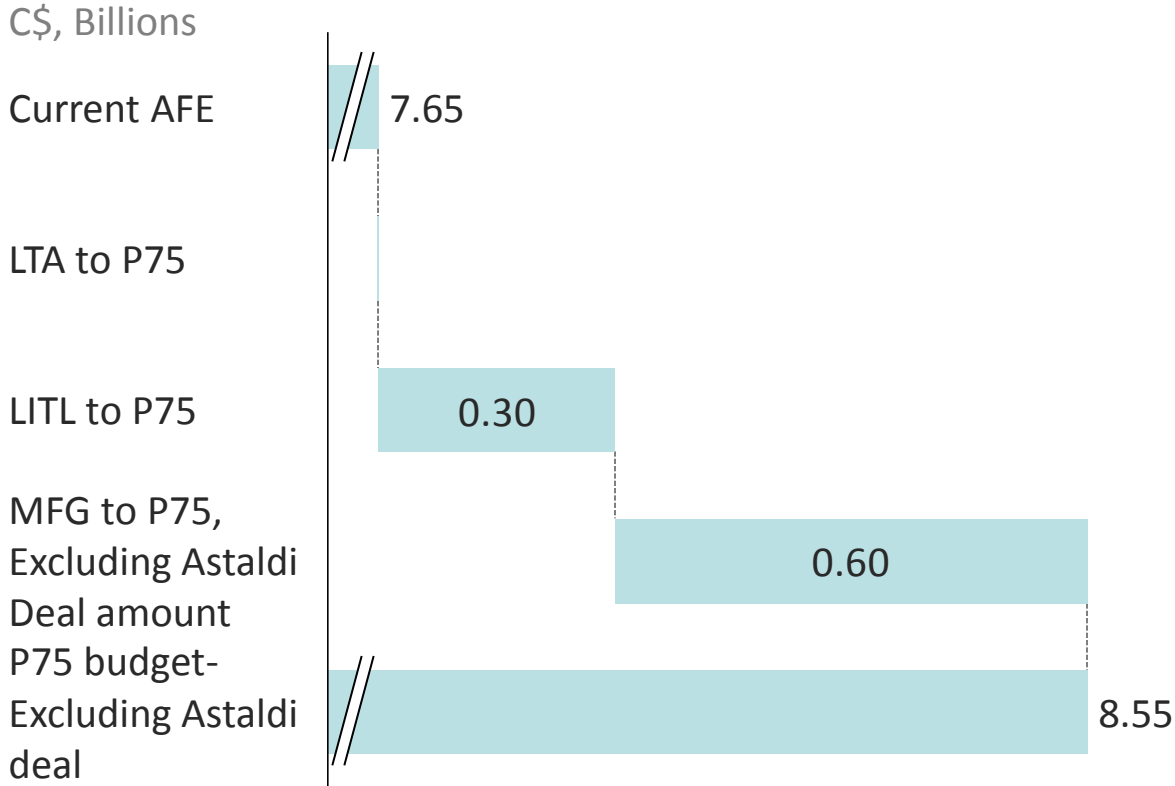
Schedule for full power (negotiated agreement with Astaldi)



- Until LIL/LTA complete and MFG full power achieved, Nalcor/NL must fund all project expenditures (including bond payments) with equity in accordance with the financing arrangements and long-term power supply and transmission related agreements with NLH

# Overall cost requirement to P75 is ~\$8.55 billion, plus Astaldi deal

## Cost build-up for LCP utilizing P75 cost-risk outcomes



**Any deal with Astaldi would be incremental to the figures shown**

- Budgeting for the P75 cost exposure of C\$8.55 billion plus Astaldi deal provides a level of certainty to LCP
- Current “likely deal range” with Astaldi is between C\$250-450 million

# Path forward

- LCP has reached a critical decision point concerning the path forward with Astaldi. Analysis indicates further delays will have a material impact on cost and schedule
- LCP team is prepared to have a comprehensive briefing on Astaldi as soon as convenient

Sharing our ideas in an open and supportive manner to achieve excellence.

# Teamwork

# Open Communication

Fostering an environment where information moves freely in a timely manner.

# Honesty and Trust

Being sincere in everything we say and do.

Relentless commitment to protecting ourselves, our colleagues, and our community.

# Safety

# Respect and Dignity

Appreciating the individuality of others by our words and actions.

# Leadership

Empowering individuals to help, guide and inspire others.

Holding ourselves responsible for our actions and performance.

# Accountability