

**From:** [jamesmeaney@lowerchurchillproject.ca](mailto:jamesmeaney@lowerchurchillproject.ca)  
**To:** [Nikolay Argirov](mailto:Nikolay.Argirov)  
**Subject:** Re: Supporting Documentation for Cost Overrun Certificates  
**Date:** Wednesday, November 19, 2014 12:39:40 PM  
**Attachments:** [.png](#)  
[Project Cost Update to MWH - 22-Jul-2014.pdf](#)

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Please see attached



Project Cost Update to MWH - 22-Jul-2014.pdf

**James Meaney**

**General Manager Finance**

**PROJECT DELIVERY TEAM**

**Lower Churchill Project**

t. 709 737-4860 c. 709 727-5283 f. 709 737-1901

e. [JamesMeaney@lowerchurchillproject.ca](mailto:JamesMeaney@lowerchurchillproject.ca)

w. [muskratfalls.nalcorenergy.com](http://muskratfalls.nalcorenergy.com)

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?

Nikolay Argirov ---11/19/2014 12:38:55 PM---Jim, Can you please resend this to me. I was at the time on vacation and missed some of the emails

From: Nikolay Argirov <[Nikolay.V.Argirov@mwhglobal.com](mailto:Nikolay.V.Argirov@mwhglobal.com)>

To: "JamesMeaney@lowerchurchillproject.ca" <[JamesMeaney@lowerchurchillproject.ca](mailto:JamesMeaney@lowerchurchillproject.ca)> ,

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"amanzer@casselsbrock.com" <[amanzer@casselsbrock.com](mailto:amanzer@casselsbrock.com)>

Date: 11/19/2014 12:38 PM

Subject: Re: Supporting Documentation for Cost Overrun Certificates

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Jim,

Can you please resend this to me. I was at the time on vacation and missed some of the emails

.

Nik

Sent from my iPhone

On Nov 18, 2014, at 9:38 PM, "[JamesMeaney@lowerchurchillproject.ca](mailto:JamesMeaney@lowerchurchillproject.ca)"  
<[JamesMeaney@lowerchurchillproject.ca](mailto:JamesMeaney@lowerchurchillproject.ca)> wrote:

Hi Joe

I'm following up on the conversation we had last week about the cost overrun certificates that will be issued by the ProjectCo's/Devco and the IE next month. As I had mentioned, we're proceeding on the basis that the supporting documentation for the aggregate \$458m cost overrun (difference between \$6,990m and \$6,531m) that will determine the payment to be made in December is the package reviewed in St John's with MWH, and I believe Canada by phone, on July 22, 2014, the week after the site visits. It is titled "Muskrat Falls Project Cost Update" and was posted to the data room on I believe August 18. I just wanted to confirm that Canada and MWH have this document as can resend if required.

Regards,

Jim

**James Meaney**

**General Manager Finance**

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# Muskrat Falls Project Cost Update

22-Jul-2014

Boundless Energy



*Confidential and Commercially Sensitive*



# Agenda

- Safety Moment
- Background
- Capital Cost Drivers and Forecast
  - Muskrat Falls (MF)
  - Labrador Island Link (LIL)
  - Labrador Transmission Asset (LTA)
- Status of Material Contracts
- Summary

Take a  
**MOMENT**  
for Safety

# Starting a fire at a construction site

- Routine activities can start a fire if necessary precautions are not taken
- Vehicles, trucks, ATVs
  - Hot engines and brakes can start fires if vehicles are parked in areas with tall dry grass
  - Tow chains can create sparks and start a fire if allowed to drag on the ground
- Power tools
  - Fuel powered tools must be equipped with working spark arrestors
  - Generator powered tools should be used in areas that are cleared of any combustible material
  - Welding must be done in areas free from debris and fire extinguishers must be present nearby
- Debris burning
  - Checking the weather forecast for sudden gusts of wind
  - Create a safe burning site, away from power lines, buildings, equipment and automobiles (site vertical clearance at least three times, and horizontal clearance twice the height of the debris)
  - Prepare the site, clear the ground around the burn site at least ten feet in all directions
  - Stay with your fire until it is completely out

# Background

- Project Engineering >98% complete
  - Detailed engineering completed as planned
  - Limited changes expected during the construction phase
  
- Procurement
  - Contracts awarded/substantially advanced for >90% of project costs
  - Quantity variations and growth accounted for in Transmission Line procurement packages

# Background

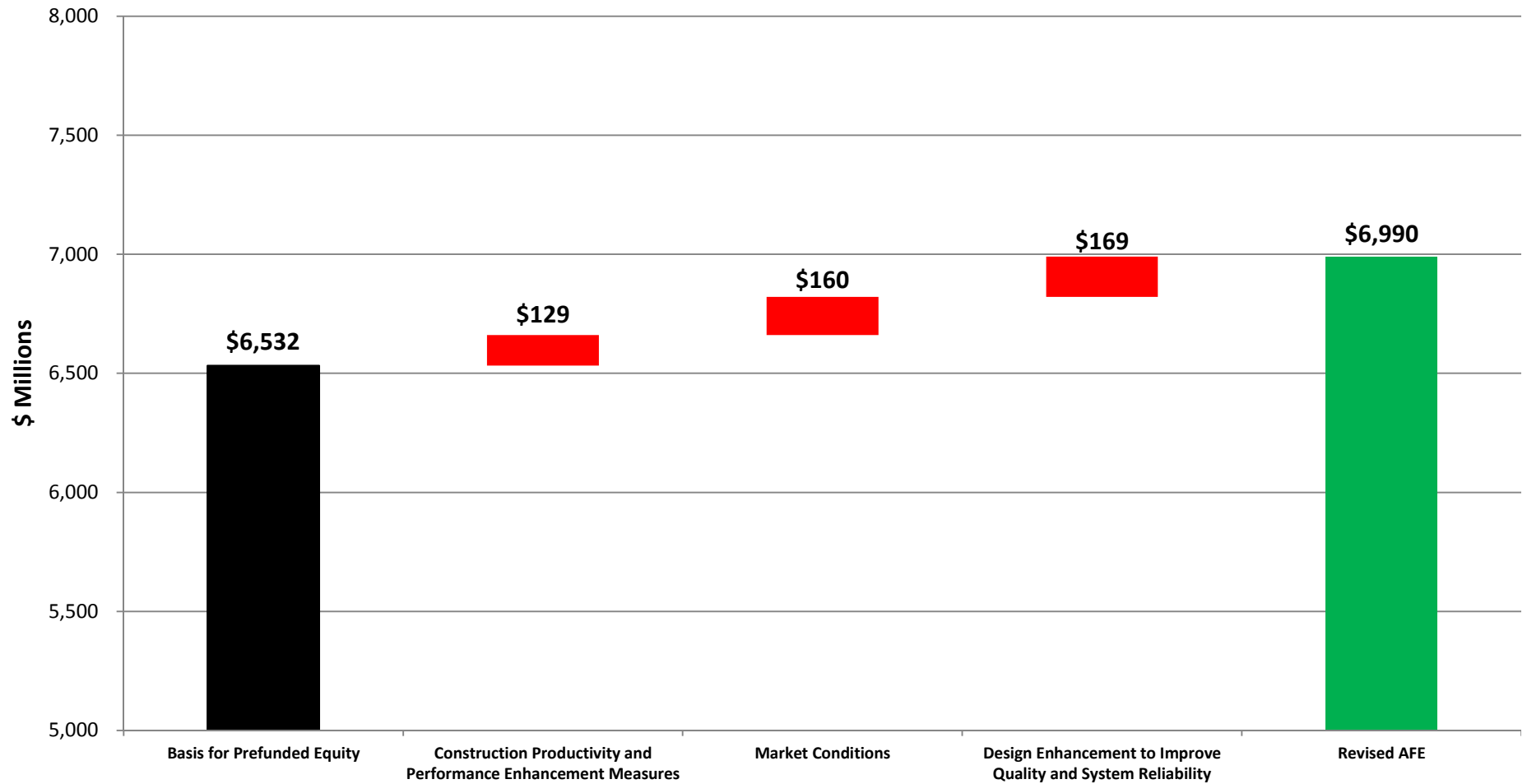
- Construction
  - Risk reduction by adopting an EPC instead of an EPCM contract approach on the HVdc Specialties
  - Capping the Labor exposure in the major civil contract in MF using an LMAX value
  - LS contracts for Electro-Mech. And Hydro-Mech. Contracts in MF (T&G, Gates, BOP)
  - Interface minimized through award of major contracts to same contractors ( T&G, Gates with Andritz)
  - ROW and Access Optimization of the DC line



# Background

- Construction
  - Contract award to contractors with proven productivity and quality records ( AC line clearing, DC specialties earthworks, AC and DC line construction)
  - Self Management for costly service contracts with potential high cost risk ( air transportation, camp maintenance)

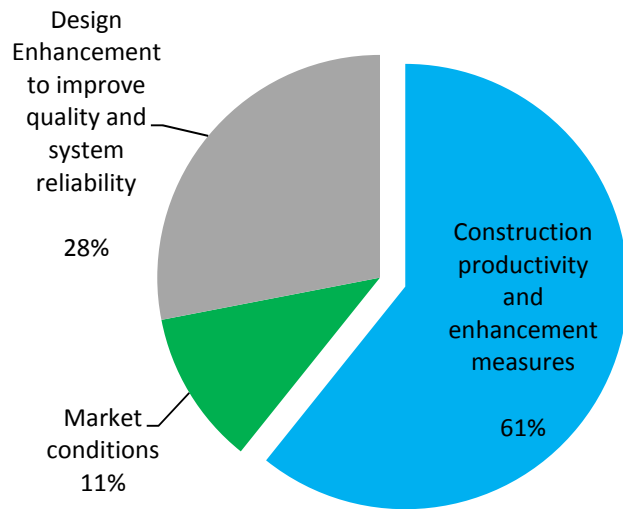
# Capital Cost Drivers and Forecast



# Capital Cost Drivers and Forecast

Asset	Construction productivity and enhancement measures	Market Conditions	Design Enhancement to improve quality and system reliability	Total
MF	\$ 65 M	\$ 12 M	\$ 30 M	\$ 107M
LIL	\$ (11) M	\$ 123 M	\$ 128 M	\$ 241 M
LTA	\$ 75 M	\$ 25 M	\$ 11 M	\$ 111 M
LCP	\$ 129 M	\$ 160 M	\$ 169 M	\$ 458 M

# MF: Construction Productivity and Performance Enhancement Measures

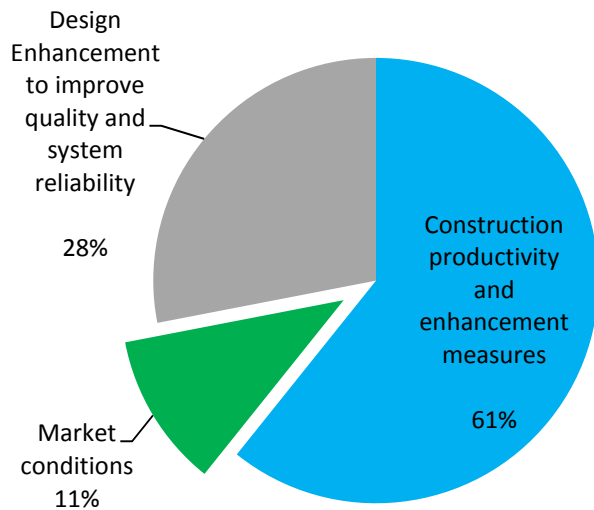


Total growth of \$ 65 M includes:

- Disputed items for on-going contracts: (SSAR, Bulk excavation) : \$ 6 M
- Cancel growth for the reservoir clearing: (\$ 2M)
- Schedule extension for North Spur and North and South dams from 2 to 3 years program: \$ 54 M
- Scope optimization for the laboratory services: (\$5M)
- Increase in Environment costs: \$ 4 M
- Increase in Owner costs: \$ 4 M
- Saving on the construction of the camp utility: (\$6 M)
- Compensation for camp readiness and over break concrete: \$ 9 M
- Construction power final contract price: ( \$ 1M)
- Freight forwarding: (\$ 2.5 M)
- Increase in insurance costs: \$ 5.5 M
- Medical services re evaluation: ( \$ 1 M)

# MF: Market Conditions

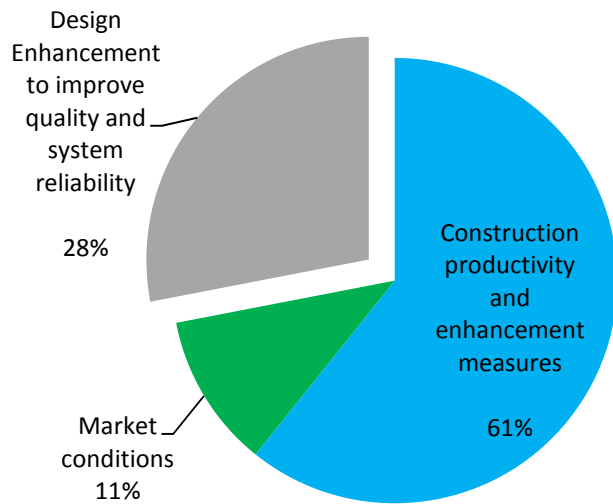
Total growth of \$ 12 M includes:



- Favorable bid prices in some of the procurement and service contracts (Generator step up transformers, Generator circuit breakers, Catering services): \$(44)M
- High prices in some of the service contracts (Ground transportation, Garbage removal): \$13 M
- Cancel of the credit related to the award of the North Spur and the North and South dams to Astaldi: \$ 43M

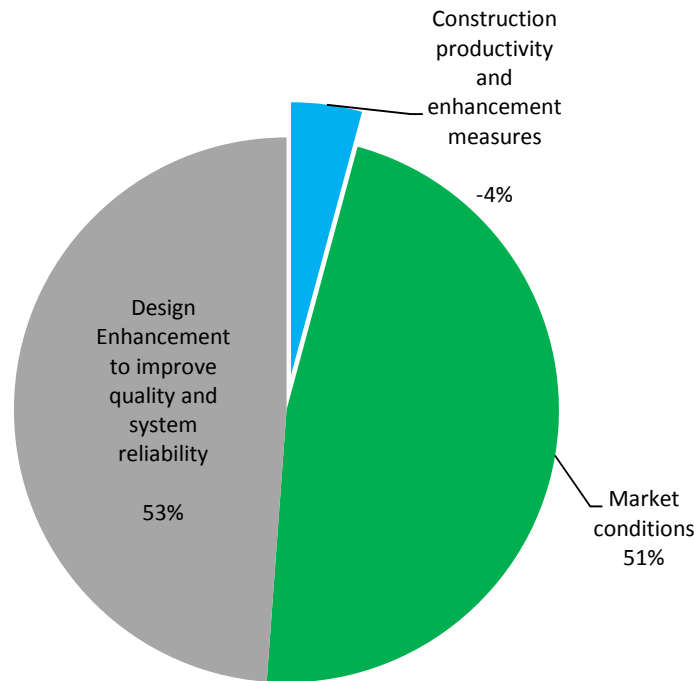
# MF: Design Enhancements to Improve Quality and System Reliability

Total growth of \$ 30 M includes:



- Design enhancements related to the North Spur and North and South dams : \$ 28 M
  - Mix design optimization
  - Design development resulting in increased quantities
  - Seepage study
  - Upstream cofferdam optimization
  
- Several Engineering changes related to design fine tuning in the Spillway and PH concrete contract: \$ 2M

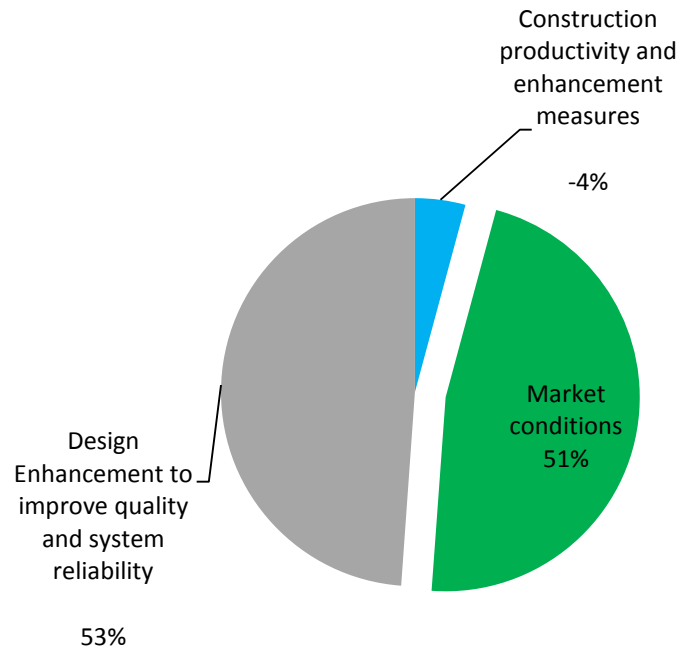
# LIL: Construction Productivity and Performance Enhancement Measures



Total growth of (\$ 11 M) includes:

- Increase in freight forwarding costs of the DC line equipment to maintain schedules and avoid delivery delays: \$ 18 M
- Re evaluation of the Environment costs: (\$ 3.5 M)
- Re evaluation of the Owner costs (salaries, helicopter costs): ( \$ 21 M)
- Reduction in SP Switchyard earthwork costs: (\$ 12 M)
- Overall saving in the feasibility engineering: ( \$ 2.5 M)
- Overall saving in the insurance cost: ( \$ 6 M)
- Increase in dc TL due to ROW and access optimization because of logistical and site constraints: \$ 23 M
- Contingency reduction: ( \$ 7 M)

# LIL: Market Conditions

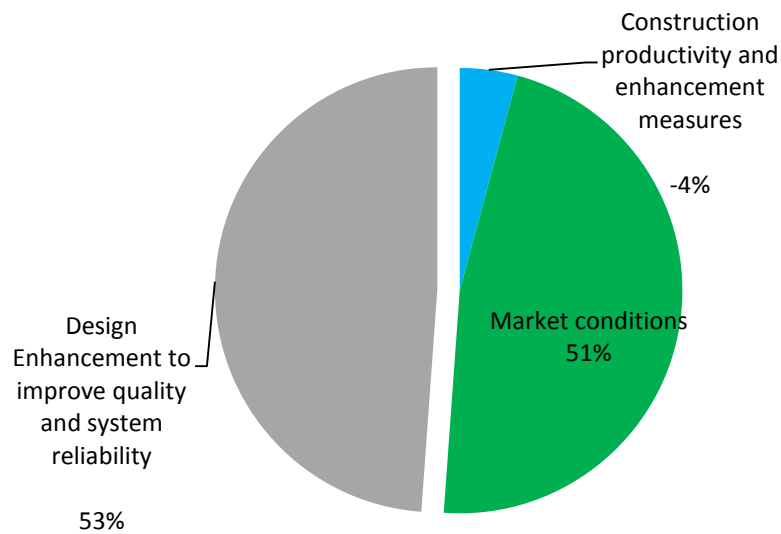


Total growth of \$ 123 M includes:

- Reflection of the current buoyant local / national market, the presence of several sites and logistic challenges related to the site locations contributed to a large portion in increasing the price of the converters civil works: \$ 8 M
- Overall saving in the TL dc equipment costs: ( \$ 9 M)
- Increase in the synch. Condenser cost: \$ 25 M
- Logistical challenges with the DC TL caused by topography highly affecting productivity especially in the Labrador section, limited competition and lack of specialized workers: \$99M



# LIL: Design Enhancements to Improve Quality and System Reliability

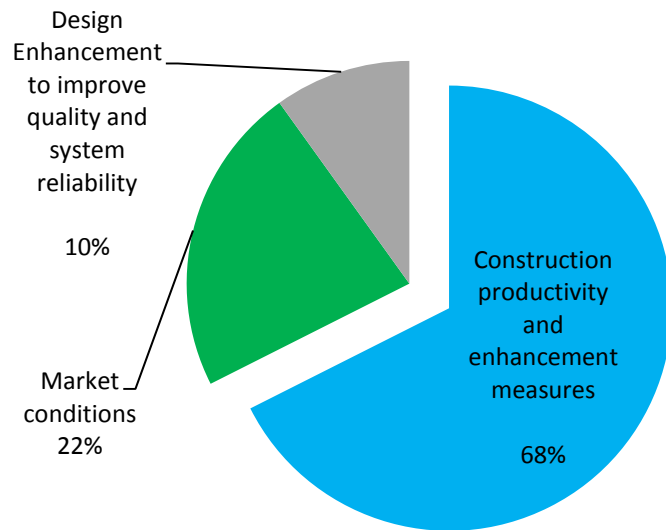


Total growth of \$ 128 M includes:

- Scope reductions at SP switchyard: ( \$ 10 M)
- Design enhancements of the DC TL : \$ 118 M
  - Increase in DC hardware quantities ( insulators, dampers,...)
  - Use of double clamps for OPGW
  - Increase in tower weight and changes in conductors and tower types
  - Use of armour rods
  - Increase in some tower foundations loading
  - Larger guy wires due to change in loads
  - Use of Implo connections
  - Increase number of accesses providing flexibility for long term operations
- Design enhancement of the synch. Condenser: \$ 20M

# LTA: Construction Productivity and Performance Enhancement Measures

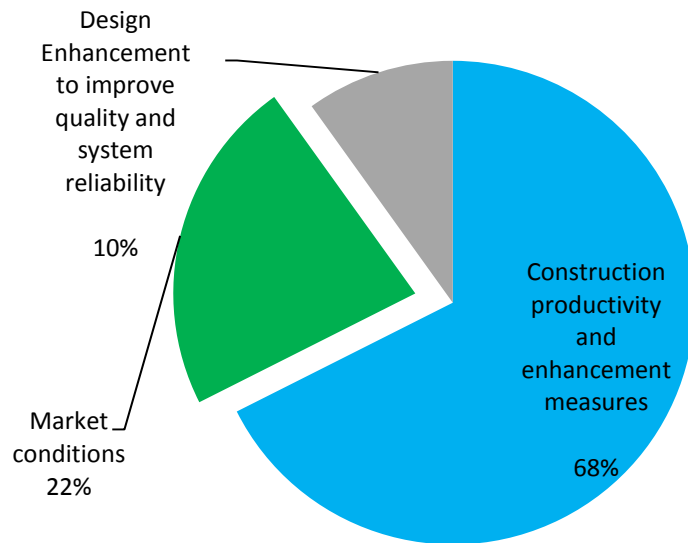
Total growth of \$ 75 M includes:



- Impact from canceling the clearing contract due to lack of resources and productivity and awarding the scope to a different contractor: \$ 14 M
- EPC instead of EPCM approach in the switchyards contract: \$ 30 M
- Increase in insurance costs: \$ 1 M
- Re evaluation of the Owner costs : \$ 24 M
- Growth related to contingency: \$ 6 M

# LTA: Market conditions

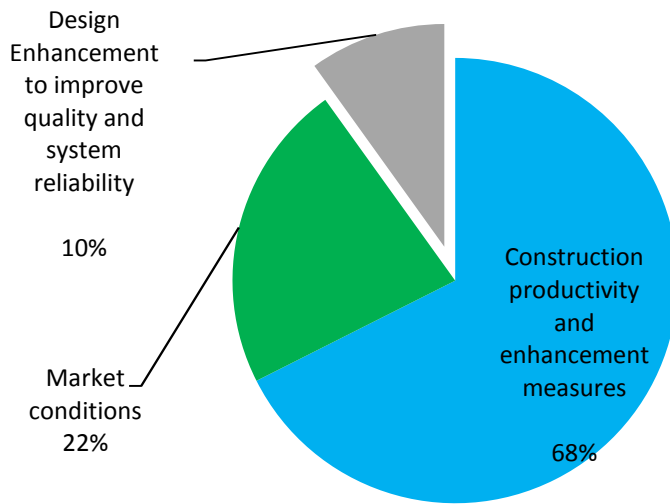
Total growth of \$ 25 M includes:



- Reflection of the current buoyant local / national market, lack of competitiveness and the presence of several sites contributed in increasing the price of the switchyards contract: \$28 M
- Saving on the final contract price of the Transformers supply: ( \$ 3 M)

# LTA: Design Enhancements to Improve Quality and System Reliability

Total growth of \$ 11 M includes:



- Contingency to cover subsurface risks on foundations that can lead to quantity changes in the ac TL construction: \$ 11 M

# Status of Material Contracts

#	Package #	Vendor	Package Title	Status	A Project Budget	B Revised AFE	C = B - A Variance	Remarks
1	CT0327	N/A	Construction of 350 kV HVdc Transmission Line - Section 1 (MF to SOBI to Deer Lake 610 km)	Under Negotiation	\$492,176,817	\$974,561,028	\$482,384,211	<ul style="list-style-type: none"> <li>Actual Over run on DC line clearing and construction is \$ 240 M</li> <li>CT 0327 FFC includes several merged contracts ( CT0343, CT0345, CT0346)</li> </ul>
2	CT0346	N/A	Construction of 350 kV HVdc Transmission Line - Section 2 (Central & Eastern NL 470 km)	Merged in CT0327	\$185,579,978	\$ -	\$(185,579,978)	<ul style="list-style-type: none"> <li>Variance included in CT0327</li> </ul>
3	CD0502	N/A	Construction of AC Substations	Bid Evaluation				<ul style="list-style-type: none"> <li>Around █████ caused by EPC approach</li> <li>█████ from market conditions</li> <li>█████ saving for SY optimization</li> </ul>
4	CD0534	N/A	Construction of Synchronous Condensers at Soldiers Pond	Bid Evaluation				<ul style="list-style-type: none"> <li>Around █████ caused by market constraints</li> <li>█████ design enhancement</li> </ul>
5	CH0009	N/A	Construction of North and South Dams	RFP to be issued				<ul style="list-style-type: none"> <li>As per latest estimates, mainly due to quantity variations and design optimization</li> </ul>
6	PH0016	ABB	Supply of Generator Circuit Breakers	Awarded	\$5,045,372	\$1,714,628	\$(3,330,744)	<ul style="list-style-type: none"> <li>Favorable bid prices</li> </ul>
7	PH0014	ABB	Supply of Generator Step-up Transformers	Awarded	\$20,547,836	\$15,250,470	\$(5,297,366)	<ul style="list-style-type: none"> <li>Favorable bid prices</li> </ul>

# Status of Material Contracts

#	Package #	Vendor	Package Title	Status	A Project Budget	B Revised AFE	C = B - A Variance	Remarks
8	CH0002-001	Liannu	Supply and Install Accommodations Complex Buildings	Awarded	\$151,826,189	\$145,997,042	\$(5,829,147)	<ul style="list-style-type: none"> <li>Mainly due to better than estimated productivity in the utility section of the contract</li> </ul>
9	SH0018	Labrador Catering	Provision of Catering, Housekeeping & Janitorial Services (MF)	Awarded	\$136,800,943	\$101,127,376	\$(35,673,567)	<ul style="list-style-type: none"> <li>Mainly due to better than estimated rates compared to the budget</li> </ul>
10	CH0006-001	IKC-ONE	Construction of Bulk Excavation Works	Complete	\$147,239,655	\$148,182,731	\$ 943,076	<ul style="list-style-type: none"> <li>Overall over run considering disputed items and final value of the contract</li> </ul>
11	LC-SB-003	Nexans	Submarine Cable Design, Supply and Install	Awarded	\$129,989,747	\$129,989,747	\$ -	
12	CH0024-001	Johnson's	Construction of Reservoir Clearing - North Bank	Awarded	\$131,170,400	\$129,170,400	\$(2,000,000)	<ul style="list-style-type: none"> <li>Growth cancelled</li> </ul>
13	CH0030	Andritz	Supply and Install Turbines and Generators	Awarded	[REDACTED]			<ul style="list-style-type: none"> <li>Growth transferred to contingency</li> </ul>
14	CH0032	Andritz	Supply and Install of Powerhouse Hydro-Mechanical Equipment	Awarded	[REDACTED]			<ul style="list-style-type: none"> <li>Growth transferred to contingency</li> </ul>

# Status of Material Contracts

#	Package #	Vendor	Package Title	Status	A Project Budget	B Revised AFE	C = B - A Variance	Remarks
15	CT0319	Valard	Construction of 315 kV HVac Transmission Line (MF to CF)	Awarded	\$259,084,236	\$258,799,807	\$ (284,429)	• Growth adjustment
16	CD0501	Alstom	Supply and Install of Converters and Cable Transition Compounds	Awarded				• Over run due to civil works high prices reflective of the market and logistical challenges of several sites
17	SM0714	SLI	Engineering, Procurement and Construction Management (EPCM) Services	Awarded	\$359,318,706	\$359,318,706	\$ -	
18	CH0007	Astaldi	Construction of Intake & Powerhouse, Spillway and Transition Dams	Awarded	\$1,024,292,550	\$1,081,107,548	\$ 56,814,998	<ul style="list-style-type: none"> <li>• \$ 43 M due to cancelling the credit related to the award of the NS and the north and south dams</li> <li>• \$ 2M transfer from CD0501</li> <li>• \$ 11 M related to additional cost of over break concrete for extra excavation and several ECN's, compensation for camp readiness</li> </ul>
19	CH0008	N/A	Construction of North Spur Stabilization Works	Bid Evaluation	\$ 70,581,127	\$89,001,927	\$ 18,420,800	• As per latest estimates, mainly due to quantity variations and market conditions related to high construction risk
20	CH0031	N/A	Supply and Install Mechanical and Electrical Auxiliaries (MF)	RFP issued				
			BALANCE OF SCOPE		\$1,780,284,599	\$1,742,860,458	\$ (37,424,141)	
			CONTINGENCY		\$ 187,639,828	\$224,517,514	\$ 36,877,686	• Contingency adjustment after forecast re evaluation
					\$6,531,754,580	\$6,990,414,249	\$ 458,659,669	

# Summary

Asset	Basis for Prefunded Equity	Growth	Revised AFE
MF	\$ 3,265 M	\$ 107 M	\$ 3,372 M
LIL	\$ 2,546 M	\$ 241 M	\$ 2,787 M
LTA	\$ 720 M	\$ 111 M	\$ 831 M
LCP	\$ 6,532 M	\$ 458 M	\$ 6,990 M <sup>(1)</sup>

(1) Includes \$ 224 M in Contingency ( 4.2% of FTC as per end of June)