

1 Q. A June 26, 2014 press release from Nalcor on the Muskrat Falls Project states that
2 “strategic investments to enhance system reliability” was one of the contributing
3 factors to an updated capital cost and further that “Nalcor has also made several
4 design enhancements to improve system quality and reliability.” Explain in detail
5 the system reliability enhancements that were made that are referred to this press
6 release and how they improved reliability for the supply of Muskrat Falls Power to
7 the Island Interconnected System.

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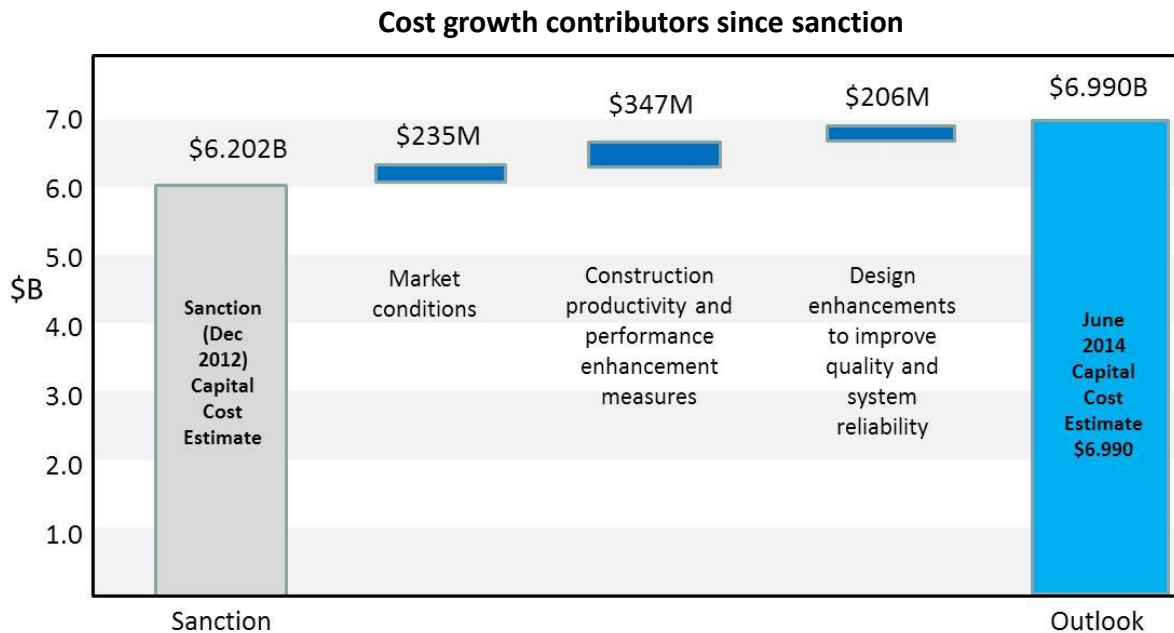
10 A. Details on the enhancements discussed in the June 26, 2014 news release are
11 provided in the following document:

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13 [http://muskratfalls.nalcorenergy.com/wp-](http://muskratfalls.nalcorenergy.com/wp-content/uploads/2013/03/Backgrounder_Muskrat-Falls-Project-Update-Key-Cost-Drivers_26Jun2014.pdf)
14 [content/uploads/2013/03/Backgrounder_Muskrat-Falls-Project-Update-Key-Cost-](http://muskratfalls.nalcorenergy.com/wp-content/uploads/2013/03/Backgrounder_Muskrat-Falls-Project-Update-Key-Cost-Drivers_26Jun2014.pdf)
15 [Drivers_26Jun2014.pdf](http://muskratfalls.nalcorenergy.com/wp-content/uploads/2013/03/Backgrounder_Muskrat-Falls-Project-Update-Key-Cost-Drivers_26Jun2014.pdf), attached as PUB-NLH-295 Attachment 1.

Backgrounder: Key Factors Influencing Capital Costs

Since the Muskrat Falls Project was sanctioned in December 2012, a number of additional investments to enhance system reliability, operation and productivity throughout construction were made. These enhancements, combined with impacts from external market factors, have refined the capital (or facilities) cost forecast for the project.



Notes:

1. Value excludes interest during construction and capitalized financing costs
2. June 2014 cost outlook includes contingency of \$224 million
3. Additions vary due to rounding

Market Conditions: \$235 million

- Highly competitive contractor and labour market with significant construction activity ongoing in Newfoundland and Labrador, around North America and globally.
- Increased need for specialized contractors and equipment for construction of the Labrador-Island Link, due to logistical challenges resulting from topographical conditions, particularly in Labrador and the Long Range Mountains.

Key Construction Productivity & Performance Enhancement Measures: \$347 million

- Enclosure of the powerhouse at Muskrat Falls to provide safer working conditions, increased productivity, reduce possible slow-downs during winter conditions, and facilitate year-round construction and employment opportunities for the project’s workforce.
- Enhanced accommodation complex, catering and general site amenities to increase recruitment and retention in a highly-competitive labour market.

- Established a 300-person starter camp at Muskrat Falls to support labour requirements during bulk excavation activities.
- Optimized the construction sequence including reconfiguring spillway construction timeline to allow rescheduling of the river diversion at Muskrat Falls from 2015 to 2016, to minimize weather risks during construction of the spillway structure.
- Significant site infrastructure upgrades, such as expansion and relocation of the laydown area and administration buildings, to increase efficiencies and productivity and facilitate concurrent activities by various contractors.
- Investment in environmental mitigation measures to reduce risk of delays during construction, such as site water controls, and the historic resource recovery program.

Strategic Investments to Design Enhancements to Improve Quality & System Reliability: \$206 million

- The design of the spillway and powerhouse at Muskrat Falls has been optimized and refined since December 2012 with the completion of additional engineering.
- Design enhancements to the spillway include the use of five low-level vertical gates to improve winter operations and reliability, and the addition of a concrete liner in the discharge channel to mitigate risk of potential downstream erosion. For the powerhouse structure, a second service bay has been added to provide operational flexibility. Additional critical spare equipment required for operation has also been procured.
- For Labrador Transmission Assets between Muskrat Falls and Churchill Falls, further corrosion protection has been added for HVac tower foundations as well as a lower utilization factor for transmission towers, increasing the reliability of the transmission line beyond the initial expected design return period, making for a more robust tower design able to withstand even harsher weather conditions.
- Final design of the HVdc transmission line to ensure the reliability of the Labrador-Island Link has resulted in a more robust transmission system with larger towers, larger foundations and a decision to fabricate the components using low temperature steel. Enhancements to the design of the synchronous condenser facility at Soldiers Pond have also been incorporated.
- Construction of an additional access points along the transmission line right-of-way that will facilitate the long-term operation and maintenance of this infrastructure.