Muskrat Falls Project Oversight Committee

Quarterly Project Update

Period Ending June 2020

November 6, 2020

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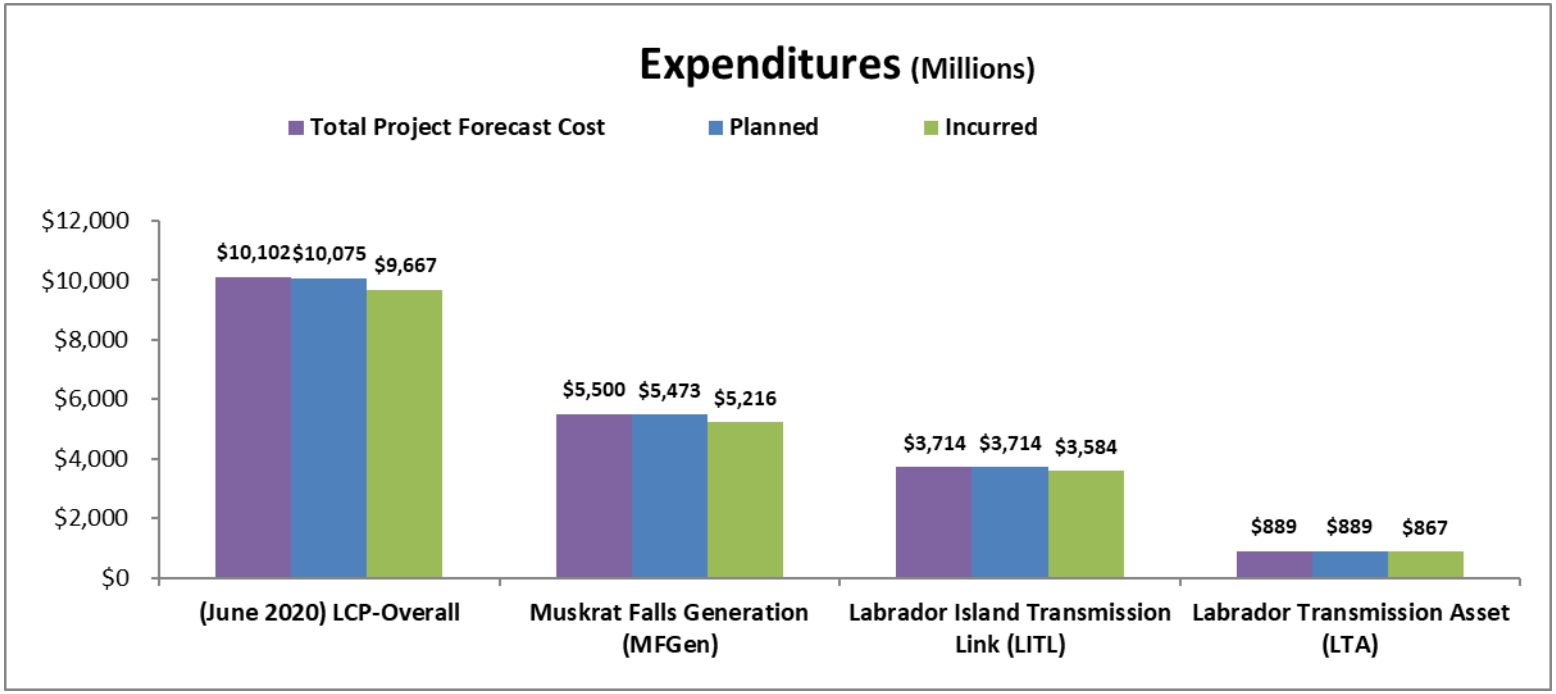
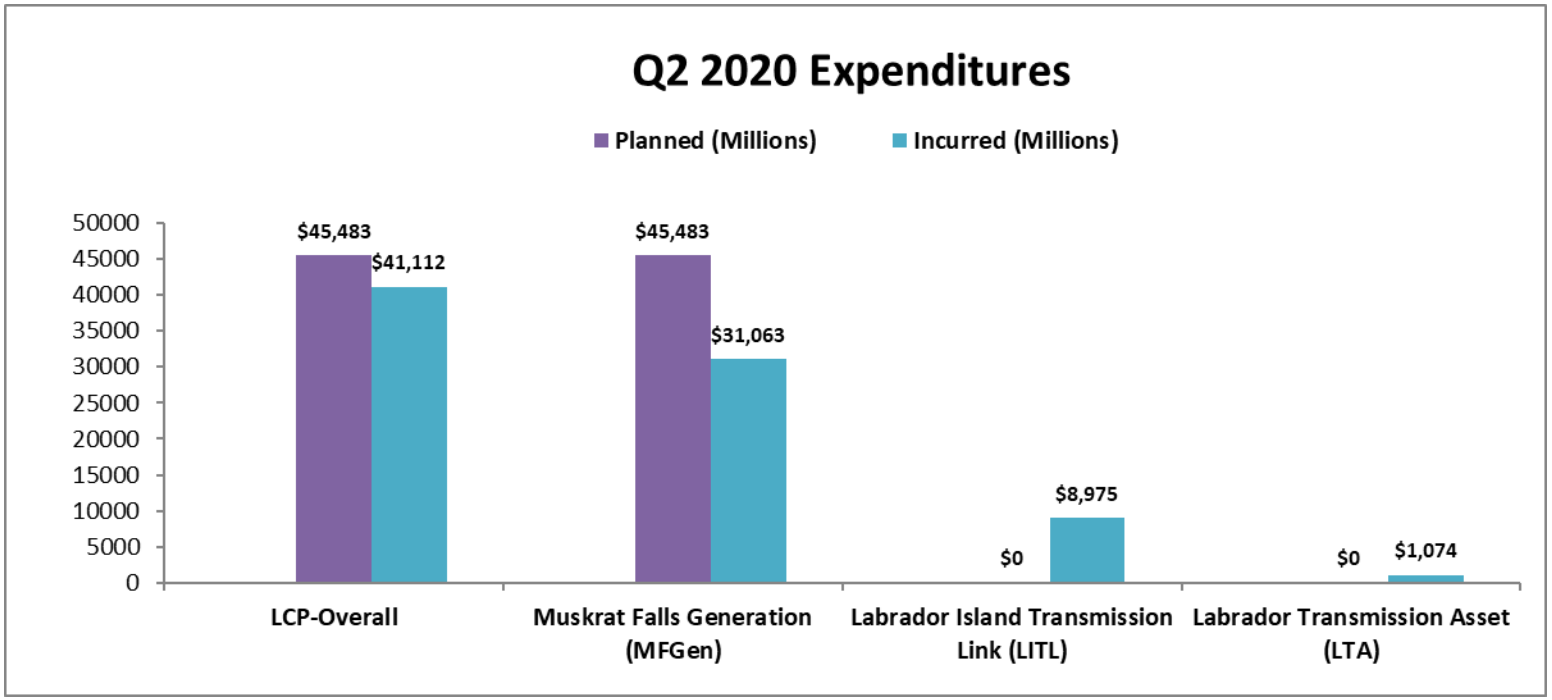
1. Q2 2020 Cumulative Costs



2. Q2 2020 Planed and Incurred Costs



3.0 Oversight Committee Reporting

3.1 Overview
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3.1 Overview

- The Oversight Committee (Committee) receives details on project costs incurred, schedule progress, changes in costs and milestone schedule, the status of construction, and manufacturing and installation contracts.
- The Committee identifies risks and issues and follows up with Nalcor to obtain more detail and explanation.
- This report covers the April to June 2020 reporting period (Q2).
- Section 3 of this report contains information developed by the Committee.
- Section 3.5 of this report includes recent information on notable activity beyond the Q2 reporting period ending, and up to the date of drafting this report (September 30, 2020). Project update information in this section supersedes information as reported in other sections of this report.
- Section 4 contains project cost and schedule information as reported by Nalcor for the reporting period ending June 2020 which includes project activity updates to mid-August 2020.
- The Annexes contain a more detailed accounting of the information provided in this report.
- The next Committee Report will cover the reporting period July 2020 - September 2020.

3.2 Committee Activities

- The Committee met on five occasions during the Quarter to receive project updates and conduct other Committee business. Committee meeting minutes and reports are available on the Committee website @ Click here and Click here.
- The Committee Chair and Natural Resources Director participated as an observer in 3 monthly calls on Nalcor project reporting to the IE and NRCan.
- The Committee Chair and solicitor met with Nalcor and its legal counsel to discuss the Astaldi arbitration.
- Planned visits to project sites continued to be placed on hold due to COVID-19 pandemic travel and physical distancing restrictions.

3.3 Independent Engineer Activities

- Project and other site visits have been impacted by COVID-19 travel restrictions. The Independent Engineer (IE) continues to monitor the project remotely and information exchanges are ongoing during this period.

3.4 Risk and Issues being Monitored by the Committee

- In its project reporting, Nalcor identifies risks which may impact project cost and schedule. The Committee reviews these and other project information to assess project risks. These risks can be found on pages 10-13 of this report.
- Over the reporting period the Committee notes:
  - Official forecast completion of key milestones under the Integrated Project Schedule (IPS) have not been updated since the reporting period ending January 2020 due to the COVID - 19 work suspension. An update is expected by the end of Q3, 2020;
  - Construction and commissioning work resumption following COVID-19 care and maintenance mode at project sites is ongoing and productivity measurements are under evaluation;
  - Litigation and Arbitration proceedings continue with Astaldi;
  - Protection and Controls (P&C) software completion for the HVdc system and schedule remains a key project risk. An interim version of bipole software has been delivered to site for testing and commissioning;
  - De-scoping of non-essential functions of the final bipole HVdc P&C software is under discussion with GE Grid;
  - Soldiers Pond synchronous condenser vibration remediation remains ongoing;
  - Powerhouse unit lower brackets and intake concrete spalling issues have been identified and are undergoing remediation;
  - Reservoir rim stability remained consistent over the Quarter; and
  - Nalcor/NLH preparedness for interconnection and operations following transfer of power and final completion of bipole remains a key focus area.

3.4 Risk and Issues being Monitored by the Committee

- The project is now largely in the installation, integration and static and dynamic commissioning phases which inherently carry associated risks.
- Risks that are being tracked by the Committee include:

A) Safety Performance

- Risk associated with simultaneous operations across multiple work sites, impact on project delivery particularly in the powerhouse, energized yards and other assets. This risk will continue through construction into operations.

B) Contractor Management and Productivity

- Nalcor ability to manage contractors and contractor ability to meet schedule;
- Contractor management and performance;
- Potential commercial negotiations to settle claims; and
- Potential for new claims as construction nears completion.

3.4 Risk and Issues being Monitored by the Committee

C) Phased Commissioning

- Completion of P&C software to enhance functionality and reliability; associated warranty considerations with early asset handover during commissioning and completion;
- Final completion and testing of HVdc system under low and full power, in-service system reliability, and timing of contractor release and effective warranty period; and
- P&C software delivery and final commissioning completion to meet future revised project schedule.

D) Astaldi

- Astaldi arbitration/litigation outcomes and potential impact on project costs.

E) Synchronous Condensers

- Remediation of vibration and other commissioning issues; and potential impact on transmission future revised project schedule.

3.4 Risk and Issues being Monitored by the Committee

F) Insurance Claims and Coverage

- Potential coverage: Preservation/re-preservation of Turbine and Generator parts - investigations ongoing - claim is still active, and resolutions are part of ongoing commercial discussions with Andritz.
- Potential coverage: Spillway secondary concrete and gate guide heater tubulars repairs – repair proposals received with some details to follow, and resumption of site activities to implement repairs are now being planned. Potential coverage still being pursued.

G) LITL and Powerhouse Commissioning

- Commissioning of LITL and powerhouse generation Units 1 through 4 and future revised schedule.

H) Reservoir Rim Stability

- Impact of reservoir full supply level on reservoir shoreline/slope stability.

I) Project Integration and Operations Readiness

- Nalcor/NLH readiness to connect the Muskrat Falls Project to the Island and North American electricity grid and operate facilities effectively.

3.4 Risk and Issues being Monitored by the Committee

J) Additional Risks (above the June 2017 Project Budget)

- COVID-19 cost and schedule impacts;
- Astaldi arbitration/litigation; and
- Alternate HVdc P&C software development.
- Funds are not held within the June 2017 Project Budget for these additional risks.

3.5 Subsequent Events to Q2 2020 and Other Notable Activity

- On June 30, 2020 Nalcor released its business and financial report for 2019 and first quarter financial results for 2020. Click here
- On August 20, 2020 Nalcor released its second quarter financial results. Click here
- On July 29, 2020 the Government of Newfoundland and Labrador provided an update on on progress of recommendations from the Muskrat Falls Inquiry. Click here
- In July, August and September 2020, Nalcor provided the Newfoundland and Labrador Board of Commissioners of Public Utilities (PUB) with monthly updates in response findings of the Liberty Consulting Group Eight Quarterly Monitoring Report on the Integration of Power Supply Facilities to the Island Interconnected System.
- In August 2020, the Committee Chair and one Independent Committee member participated in a limited site visit to the Soldiers Pond Synchronous Condenser building to observe synchronous condenser commissioning and vibration remediation activities.
- A new emerging risk has been identified with Soldiers Pond and Muskrat Falls Converter building Valve Halls. The Committee will be monitoring this risk as root cause and remediation is determined in future reporting.
- On September 22, 2020 Muskrat Falls Generation First Power Grid Sync was achieved.

3.5 Subsequent Events to Q2 2020 and Other Notable Activity

Nalcor September 2020 Update (LITL Valve Halls)

- Nalcor has advised that during LITL commissioning, a flashover incident in the Soldiers Pond Pole 2 valve hall on August 13, 2020 resulted in equipment failure triggering a trip of the LITL. Subsequently, on August 23, 2020 a similar incident occurred in the MF Pole 1 valve hall. Nalcor has reported that:
  - GE Grid has brought in valve experts from Europe to lead the investigation and testing at both sites. The focus of the investigation is on a residue that has been observed on beams located inside the valve halls, which is wide spread in both converter stations. The origin of this residue is unknown but could be possibly linked to the composition of the beams themselves.
  - GE has collected samples from Soldiers Pond and Muskrat Falls to test the residue composition to determine if it has conductive properties that could have caused the flashover
  - Damaged beams at Soldiers Pond and Muskrat Falls have been replaced.
  - GE Grid's preliminary root cause analysis indicates that a manufacturing defect is the cause and the residue and beams will have to be replaced (approximately 90% or 350).
  - A schedule and plan for further beam replacement is being developed. This is a significant emerging risk for the project.
  - GE Grid has presented Nalcor with an interim solution that will allow dynamic commissioning to recommence in early November while the final remediation solution and schedule is determined.

3.5 Subsequent Events to Q2 2020 and Other Notable Activity

Nalcor September 2020 Update (LITL Bipole Software Development)

- Nalcor has advised that GE Grid is continuing their work on Interim Bipole Software and resolving known deficiencies in Release A. Factory Accepted Testing (FAT) for Release B of the Interim software is planned to start on September 21, 2020. Nalcor indicates that:
  - After successful completion of FAT, Release B will be ready for installation; however, resumption of commissioning activities is pending resolution of the valve hall incident. Once Release B is issued for commissioning, the GE Grid Stafford team will be fully focused on Final Bipole Software development.
  - GE Grid reports that they will be in a position to present a full schedule for Final Bipole Software within the month of October 2020.

Nalcor September 2020 Construction Update (LITL Sync Condensers)

- Nalcor has advised:

Unit	Status
2	Hydrogen detection system modification is ongoing. Current schedule (September 16, 2020) is to start running unit 2 in late September. Additional vibration data will be captured once the unit is re-started.
3	Elliptical bearings have been installed. All auxiliary systems have been reconnected internally. Assembly of remaining parts is ongoing. The initial rotation test was unsuccessful; however manual rotation is now ongoing. Dynamic commissioning is scheduled to commence mid-October.
1	Bearing installation is pending the results of unit 3 restart with the redesigned elliptical bearing.

3.5 Subsequent Events to Q2 2020 and Other Notable Activity

Nalcor September 2020 Update (Sync Condensers / Lateral Vibration–Foundation Remediation)

- Nalcor has advised:
  - 60% design review is now complete; schedule will follow design review.
  - Based on the design phase progress, the earliest construction start date is November. GE Power and LCP are working on priorities and logistics for mobilization.
  - Foundation remediation work on unit 1 is the priority in order to determine if further foundation remediation is required for the remaining units or if the units only require bearing modifications.

Nalcor September 2020 Update (Muskrat Falls Powerhouse)

- Nalcor has advised:
  - Unit 1 mechanical overspeed (150%) test was completed with no observed issues during the test. Unit 1 was dewatered for a planned inspection following the overspeed test. All inspections are now complete.
  - Intake sill/lintel concrete spalling - a repair method (epoxy filler) was presented by Andritz and repairs were completed during the Unit 1 inspection period.
  - Commencement of online grid synch testing will occur during the week of September 21st, 2020.
  - During Unit 2 commissioning an oil leak occurred from the bearing. The leak was isolated to the Tailrace area and cleanup is now complete.
  - Commercial power for Unit 1 is forecasted for late October, 2020, Unit 2 in December 2020, Unit 3 in May 2021 and unit 4 in September 2021.

3.5 Subsequent Events to Q2 2020 and Other Notable Activity

- On September 16, 2020 Nalcor provided a revised cost and schedule update as indicated on this and following slides. As of the end of September 2020, the Committee has not yet been supplied with the Integrated Project Schedule (IPS), other than key milestone dates. The IPS is expected by the end of October 2020.
- Muskrat Falls Project Revised Forecast September 2020 (September 16, 2020)

Sub-Project	Existing AFE ($000)	Updated Forecast ($000)	Variance ($000)
MFGen	$5,500	$5,560	$59.9
LITL	$3,714	$3,738	$23.8
LTA	$889	$880	-$9.0
TOTAL	$10,102	$10,117	$74.7
Budget Request			$74.7

  - Includes an increase of approximately $152 Million for COVID-19 and other risk impacts. Approximately $77 Million of this impact was covered by the existing project budget contingency
  - MFGen - approximately $147 Million in COVID-19 impacts
  - LITL - approximately < $5 Million in COVID-19 and $19 Million in other impacts
  - LTA – N/A
  - Of the $152 Million total, approximately $48 Million is attributed to major contract costs and $104 million in site services and owner/environmental/IBA/legal costs
- The updated revised forecast includes a 15 per cent contingency
- Calculations are premised on the basis that without COVID-19, the project would have been completed by end of November 2020

3.5 Subsequent Events to Q2 2020 and Other Notable Activity

Key Milestones Update

Milestone	Previous Forecast (Jan 2020)	Revised Forecast (Aug 2020)
First Power (Grid Synch)	15-Mar-2020	30-Sep-2020
U1 – Commercial Power	15-Apr-2020	31-Oct-2020
U2 – Commercial Power	20-Jun-2020	31-Dec-2020
U3 – Commercial Power	17-Sep-2020	31-May-2021
U4 – Commercial Power	18-Nov-2020	30-Sep-2021
Full Power	18-Nov-2020	30-Sep-2021
Converter Stations Bipole Dynamic Testing Complete	31-Aug-2020	30-Sep-2021
All Synchronous Condensers Ready for Operation	14-Aug-2020	31-Aug-2021[1]
Commissioning Certificate	1-Sep-20 (Under Review)	TBD[2]

1. Assumes foundation remediation solution and that all three synchronous condenser units have had their foundations modified
2. Based on completing a 675 MW only high power mono-pole overload test to achieve LITL Commissioning Date in October 2021 and pending discussion with Nalcor, the Independent Engineer, Province and Canada on final high power 900MW test requirements (900 MW is stipulated in the Project Financing Agreements (PFA's))

3.5 Subsequent Events to Q2 2020 and Other Notable Activity

Items without Allowances in the Revised September 2020 Budget Forecast

- Power Supply
  - Delay/costs due to valve hall rework. Budget and forecast was prepared prior to recent valve hall incident) - Nalcor reports any costs associated with this work is GE Grid's responsibility
  - Any costs associated with synchronous condenser foundation remediation - Nalcor reports this cost is the responsibility of GE Power
  - Significant legal costs due to ongoing disputes with contractors
- Power Development
  - Any award to Astaldi in ongoing arbitration
  - Any significant new legal disputes
- General
  - Failure to meet key milestones
  - Second wave of COVID-19

3.5 Subsequent Events to Q2 2020 and Other Notable Activity

Financing and Other Costs Update

In-Service Costs	Status
Debt Financing Costs	Associated with the Canada guaranteed $7.9B (FLG) debt financing including bond interest (IDC), guarantee fees, financing reserves and related costs
Allowance for Funds Used During Construction (AFUDC)	Non-cash interest which accrues on Nalcor/Emera's equity participation in the LITL Limited Partnership which gets recovered through electricity rates over the life of the asset
Transition to Operations (TTO) Costs	Associated with the transition of the MFGen, LTA and LITL assets from construction to full operation, including interim operation during the pre-commissioning period

- Delay in project completion results in additional facilities and AFUDC costs.
- Other costs related to debt financing and majority of TTO costs are not incremental, but are now required to be funded by equity rather than being recovered from ratepayers until commissioning is achieved. Bond principal payments are due in December of 2020 and June 2021 which must also be now funded.
- See following slide for details.

3.5 Subsequent Events to Q2 2020 and Other Notable Activity

Project In-Service Cost / Budget Summary

($ Millions)		Jun 2017	Nov 2019	Sep 2020
Commissioning Date		*Sep-2020*	*Sep-2020*	*Oct-2021* (3)
Facilities Capital Costs				
MF	(1)	5,500	5,500	5,560
LIL/LTA	(1)	4,617	4,602	4,618
		10,117	10,102	10,177
Financing Costs				
MF	(1)	706	708	849
LIL/LTA	(1)	871	829	990
AFUDC	(2)	439	425	558
Reserves	(2)	343	348	348
		2,359	2,310	2,744
TTO/Pre-Comm Costs	(1)	259	153	190
Total Project Cost at In-Service		**12,736**	**12,565**	**13,111**
Bond Principal Repayments	(4)	-	-	61

1) Board approved

2) Authorization of Board is not required

3) Completion of 675 MW high power monopole overload test only to achieve a LITL commissioning date in Oct 2021

4) Includes the repayment of principal amounts in Dec 2020/Jun 2021 associated with the FLG2 bond issuance completed in May 2017. If the commissioning date is later than Oct 2021 due to higher LITL testing levels being required, then additional funding may be needed for debt payments due Dec 2021 (Principal repayments: $31M; sinking fund payments: $71M; 2 months additional interest not included above: $48M)

- Chart above does not include deferral of sinking funds payments already agreed between Canada and the Province in February 2020 (estimated at approximately $130 million)

4.0 Nalcor Reporting

4.1 Summary - Quarter Ending June 2020
4.2 Project Expenditures
4.3 Contingency
4.4 Earned Progress

*Information in this section was provided for period ending June 2020 project reporting. Recent updates to this section can be found in Section 3.5.

4.1 Summary – Quarter Ending June 2020

- June 2020 Summary:
  - Overall construction progress is at 99.3% (December 2019);
  - $9,667 Million in incurred costs; and
  - $9,723 Million in committed costs.
- As a result of the COVID-19 pandemic, the project took specific steps to ensure the health and safety of all workers as well as the public.
- Construction at Muskrat Falls and Soldiers Pond was paused and placed into care and maintenance and the Project office at Torbay Road was closed with majority of the project team working remotely from home as per guidance from the Government of Newfoundland and Labrador.
- Given the duration of work suspension along with other COVID-19 related restrictions, it is known that there will be schedule and cost impacts on the Project.
- The project team is continuing to evaluate the consequences of COVID-19 on cost and schedule; however, the full impact on both the final forecast cost and the key schedule milestones remains unknown at this time.
- The delay to completion could potentially range from 6 to 10 months, with a potential cost impact of $130 Million to $200 Million.
- The project team is unable to provide a reliable forecast date for the key milestones that have not yet been achieved; therefore, the IPS will not be updated until there is greater certainty on the path forward, and contractor experience under the new conditions has been evaluated.

4.1 Summary – Quarter Ending June 2020

- As of June 2020, the June 2017 budget final forecast cost remains unchanged.
- While the overall budget and final forecast cost remains unchanged, variances between the project budget and final forecast costs have occurred within and among expenditure categories. Most variances are related to the transfer of budget between allocations from the contingency budget to the procurement and construction budget. As well, there are transfers of unused budget from procurement and construction to the contingency budget to be used in other areas of the project.
- Does not include Additional Risks as reported on slide 13, which at the end of June 2020 totaled approximately $850 Million. If these risks are realized, they may become project costs.
- The current forecast contingency budget at June 2020 is $103.0 Million, a decrease of $26.2 Million from the previous Quarter. For further detail see Section 4.3.

4.1 Summary – Quarter Ending June 2020

Quarterly Planned vs Incurred Cost Variances:

MFGen	
Cumulative Planned: $5,473M	Q2 2020 Planned: $45M
Cumulative Incurred: $5,216M	Q2 2020 Incurred: $31M
Variance: -$257M (-4.7%)	Variance: $14M (-31.1%)

- Planned expenditure by month was set in June 2017.
- During Q2 2020, the variance in planned vs. incurred cost is primarily due to lower than planned incurred due to the site ramp down to care and maintenance mode due to the COVID-19. Remobilization commenced in the later half of the Quarter.
- See Section 4.2 and Annex B for further detail.

4.1 Summary – Quarter Ending June 2020

Quarterly Planned vs Incurred Cost Variances:

LITL	
Cumulative Planned: $3,714M	Q1 2020 Planned: $0M
Cumulative Incurred: $3,584M	Q1 2020 Incurred: $9M
Variance: -$130 (-3.5%)	Variance: $9M

LTA	
Cumulative Planned: $889M	Q1 2020 Planned: $0M
Cumulative Incurred: $867M	Q1 2020 Incurred: $1M
Variance: -$22M (-2.5%)	Variance: $1M

- The planned expenditure by month was set in June of 2017.
- During Q2 2020, incurred was higher than planned due to extension of work scope into 2020, whereas work scope was planned to be substantially complete in 2018.
- See Section 4.2 and Annex B for further detail.

4.1 Summary – Quarter Ending June 2020

Earned Progress: (As of December 2019)

- MFGen
  - >98.5 complete
- LITL
  - >99% complete
- LTA
  - Complete
- See Section 4.2 and Annex C for further detail.

4.1 Summary – Quarter Ending June 2020

Power Development[1]:

Project actions in response to the COVID-19 Pandemic this Quarter include:

- Guidelines and procedures have been put in place to commence remobilization of the Muskrat Falls workforce;
- Remobilization commenced in May 2020;
- Force Majeure has been lifted on all major contracts since June 1, 2020; and
- Workforce is carrying out construction and commissioning activities within COVID-19 protocols.

1 Some activities in this and the following Power Development slides have occurred since June 2020.

4.1 Summary – Quarter Ending June 2020

- Major Contracts Status Update - Turbines and Generators

Unit	Status
1	• In July during testing movement was noted between the radial arms of the lower bracket and the lower bracket sole plates. Commissioning was halted and a root cause analysis indicated that the radial keys did not fit snugly allowing movement which caused cracking in the weld between the keys. Redesign of the key arrangement has been completed and weld detail between the keys has been improved. • In July, concrete debris was observed in the intake water passage. It has been identified as secondary concrete originating from the intake and roller gate sill and lintel. A repair method (epoxy filler) has been presented by Andritz and repairs are planned during the inspection period noted below. • A mechanical overspeed (150%) test was completed with no observed issues. The unit has been dewatered for a planned inspection after the test. The inspection duration will be approximately 2 weeks. • On-line (electrical) commissioning is expected to resume by the end of August with commercial power expected in September.
2	Pre-commissioning and P&C backfeed commissioning are ongoing: • Water up is planned for after Unit 1 in service (test equipment must be moved from Unit 1 to 2) • Transformer energization (backfeed) is also expected in September. • New lower bracket keys have been fabricated for Unit 2. Installation is ongoing. This work is being completed in-line with other Unit 2 activities. • Intake concrete will be inspected after wet commissioning is under way. • Unit 2 commercial power expected in November.
3	Assembly is ongoing, generator shaft installed and rotor pole installation under way.
4	Assembly is ongoing, wicket gates installed, and head cover assembly is under way.

- The forecast for Unit 3 and 4 commercial power is under evaluation, and will be incorporated in the IPS to be issued in September 2020.

4.1 Summary – Quarter Ending June 2020

- Major Contracts Status Update - Balance of Plant
  - Cahill-Ganotec (CG) is completing balance of plant systems and clearing punch list items, with a focus on Unit1.
  - Currently CG is continuing to work on the following systems:
    - Fire Damper Reinstatement
    - FSCS Panel (cables pulled)
    - Fire Detection Systems ongoing with Troy representative
    - Support for Unit 1 commissioning
    - Fireproofing in compressor room
    - Reinstatement of fire protection
    - Punchlist Items
  - Vendor representatives are on site, and have resumed commissioning and start-up of priority systems.
- Arbitration with Astaldi continues; payment of Astaldi related liens against the project continues; Nalcor intends to recover any costs associated from Astaldi or the contract's securities; witness statements have now been exchanged. Other project residual contingency, funds are not held within the June 2017 budget should net damages be awarded in Astaldi's favour.
- Focus areas for Q3, 2020 include commissioning of Units 1 and 2. Forecast expenditure for Q3, 2020 is estimated at approximately $95 Million.

4.1 Summary – Quarter Ending June 2020

Power Supply[1]:

Project actions in response to the COVID-19 Pandemic this Quarter include:

- Nalcor and contractors continue to follow all COVID-19 Health and Safety measures as per the Guidelines;
- The Torbay Road Project office has reopened. All staff are required to participate in an Office Restart Orientation before returning to the office;
- Update of the forecast schedule and estimate of costs to complete, including COVID-19 related impacts, is currently ongoing; and
- Update of the IPS and any AFE updates will be complete by the end of September 2020.

[1] Some activities in this and the following Power Supply slides have occurred since June 2020.

4.1 Summary – Quarter Ending June 2020

Bipole Status

- Factory Acceptance Testing (FAT) for interim bipole software concluded on July 24, 2020;
- A number of bugs were identified; however, the number and severity of the bugs were small enough that Nalcor has given GE permission to send the software to site to proceed with the next stage of on-site testing;
- Interim bipole software “Release A” has been uploaded at Soldiers Pond and Muskrat Falls and static checks are in progress;
- Energization of equipment is scheduled to start the week of August 10, 2020 followed by power transfer testing; and
- Outstanding bugs found during FAT, as well as any found during dynamic commissioning of “Release A”, that are required to be resolved before the start of Trial Operations will be corrected in Release B.

4.1 Summary – Quarter Ending June 2020

Bipole Status

- Interim Bipole Software (Low Power < 450MW)

Milestones	GE Schedule
Interim Software “Release A” (Software to site) Achieved July 30, 2020	July 16, 2020
“Release A” Dynamic Commissioning Complete Low Load (90-225MW)	Not updated
Interim Software “Release B” (Software to site) Updated version of software with FAT and site identified bugs fixed	Not updated
“Release B” Dynamic Commissioning Complete Low Load (90-225MW)	Not updated
Trial Operations Start (90-225MW) Trial ops is complete after 30 consecutive days of operation without a trip	Not updated

- Final Bipole Software (High Power < 900MW)
  - Discussions are ongoing with GE regarding Final Bipole Software functions and schedule. A schedule update is anticipated in September 2020.
  - Final commissioning of LITL will require system conditions that permit the transfer of high loads (675-900MW) to the island, including through to NS, that do not jeopardize island system security. These loading conditions are seasonal and anticipated to be available in the Fall of 2021.

4.1 Summary – Quarter Ending June 2020

Bipole Status

- GE Grid De-Scope of Non-Essential Functions
  - Nalcor is discussion with GE Grid to de-scope non-essential functions from the final high power bipole software for the HVdc transmission system in order to improve on the schedule for delivery of final software.
  - This de-scope will reduce the software development effort through removal of features that are deemed non-essential to proper and reliable operation of the LITL. The features being removed fall into two broad categories;
    - features that were not in the original specification for software but were planned to be delivered; and
    - features that are essentially duplicates – functionality can be achieved through other features that are being developed.
  - The Independent Engineer has reviewed and agreed with the plan to de-scope non-critical functions.

4.1 Summary – Quarter Ending June 2019

Synchronous Condensers

Unit 2

- The unit has been operating at low capacity (up to 45MVAR) since August 3, 2020 in support of LITL commissioning;
- Vibration data is being collected and analyzed by GE Power. Overall levels are below alarm set points at the current capacity. A full vibration analysis will be done when commissioning loading is complete in September 2020; and
- The hydrogen system sensor issue (July 2020) previously reported has been investigated and it has been determined that a sensor inside the unit was not registering the correct hydrogen concentration due to its location. The sensor will be moved when the unit is taken offline.

Unit 3

- Redesigned elliptical bearings to assist with vibration for the unit are scheduled to be on site the week of August 10th, 2020. Preparations for installation will start as soon as the bearings are received. Installation is anticipated to take approximately 6 weeks.

Unit 1

- Bearing installation is pending the results of unit 3 restart with the redesigned elliptical bearing.

- Power Supply see schedule slippage risk as high.

4.1 Summary – Quarter Ending June 2020

Synchronous Condensers

- Lateral Vibration – Foundation Remediation
  - GE Power consultants, Vector and SGH, completed a 25% Design Review Phase on August 5, 2020, and presented pros and cons for the two most promising foundation remediation concepts.
  - Based on the current design stage, and selected concepts, GE Power has provided possible construction sequences and a range of schedule durations for the foundation remediation work:
    - Three units in parallel – 21 to 25 weeks to complete
    - Three units in series – 41 to 60 weeks to complete
    - Test one unit before proceeding with other two units – 31 to 46 weeks to complete.
  - The selection of a constriction sequence will be based on a decision matrix that includes Unit 3 elliptical bearing performance, Unit 2 vibration analysis, LITL commissioning status, and the requirement to have syncs online.
  - Remediation options and schedule will be refined as the design review progresses.
  - The design review stage is scheduled to be complete in November; however, contractor mobilization can start in September upon completion of the 60% Design Review Phase. The earliest start date for construction is October 2020.

- The focus for Q3 2020 is on continued completions, commissioning and integration of operations; and the forecast expenditure for Q3 2020 is estimated at approximately $53 Million.

4.2 Project Expenditures

June 2020 ($000)	Project Budget June 2017 AFE amended November 2019	Cumulative $			Cumulative %		
		Plan	Incurred	Variance	Plan	Incurred	Variance
Description	*A*	*B*	*C*	*C-B*	*D=B/A*	*E=C/A*	*E-D*
NE-LCP Owners Team, Admin and EPCM Services	$1,115,235	$1,144,657	$1,072,358	($72,299)	102.6%	96.2%	-6.5%
Feasibility Engineering	$37,072	$37,073	$35,847	($1,226)	100.0%	96.7%	-3.3%
Environmental & Regulatory Compliance	$42,669	$42,614	$39,556	($3,058)	99.9%	92.7%	-7.2%
Aboriginal Affairs	$17,478	$17,476	$45,976	$28,500	100.0%	263.1%	163.1%
Procurement & Construction	$8,475,290	$8,745,644	$8,384,993	($360,651)	103.2%	98.9%	-4.3%
Commercial & Legal	$90,423	$87,872	$88,378	$506	97.2%	97.7%	0.6%
Contingency	$324,162	$0	$0	$0	0.0%	0.0%	0.0%
TOTAL	$10,102,328	$10,075,336	$9,667,108	($408,228)	99.7%	95.7%	-4.0%

June 2020 ($000)	Project Budget June 2017 AFE amended November 2019	Incurred Cumulative Costs June 2020	Project Final Forecast Cost June 2020	Variance PFC from Budget
Description	*A*	*B*	*C*	*D=A-C*
NE-LCP Owners Team, Admin and EPCM Services	$1,115,235	$1,072,358	$1,164,734	($49,499)
Feasibility Engineering	$37,072	$35,847	$35,847	$1,225
Environmental & Regulatory Compliance	$42,669	$39,556	$40,408	$2,261
Aboriginal Affairs	$17,478	$45,976	$50,960	($33,482)
Procurement & Construction	$8,475,290	$8,384,993	$8,598,924	($123,634)
Commercial & Legal	$90,423	$88,378	$108,453	($18,030)
Contingency	$324,162	$0	$103,002	$221,160
TOTAL	$10,102,328	$9,667,108	$10,102,328	$0

Columns in tables may not total due to rounding

4.3 Contingency

June 2020 ($000)	Project Budget June 2017 AFE	March 2018 AFE Adjustment	November 2019 AFE Adjustment	Project Forecast Cost March 2020	Project Forecast Cost June 2020	Change from Previous Quarter	Variance PFC from Budget
	A	-		*B*	*C*	*C - B*	*C - A*
Total Project	$339,162	$339,162	$324,162	$129,200	$103,002	($26,198)	($221,160)

Columns in tables may not total due to rounding

4.4 Earned Progress (December 2019)

Cumulative to end of December 2019	Weight Factor %	December 2019 Cumulative % Earned
Sub-Project	A	C
Muskrat Falls Generation (MFGen)	46.3%	98.5%
Labrador Island Transmission Link (LITL)	43.9%	99.97%
Labrador Transmission Asset (LTA)	9.8%	100.0%
Muskrat Falls Project - Overall	100.0%	99.3%

Columns in tables may not total due to rounding

Annex A

I. Project Capital Budget
II. Project Milestone Schedule

Columns in tables may not total due to rounding

I. Project Capital Budget

Muskrat Falls Generating Facility (in $ thousands)	June 2017 AFE
Expenditure Category	
NE-LCP Owners Team, Admin and EPCM Services	$655,850
Feasibility Engineering	$17,543
Environmental & Regulatory Compliance	$27,125
Aboriginal Affairs	$16,395
Procurement & Construction	$4,501,984
Commercial & Legal	$54,760
Contingency	$226,400
Muskrat Falls Generation Total	$5,500,056
Labrador-Island Transmission Link (in $ thousands)	**March 2018 AFE**
Expenditure Category	
NE-LCP Owners Team, Admin and EPCM Services	$322,101
Feasibility Engineering	$19,167
Environmental & Regulatory Compliance	$14,726
Aboriginal Affairs	$1,003
Procurement & Construction	$3,233,690
Commercial & Legal	$30,280
Contingency	$92,750
Labrador-Island Transmission Link Total	$3,713,716
Labrador-Transmission Assets (in $ thousands)	**November 2019 AFE**
Expenditure Category	
NE-LCP Owners Team, Admin and EPCM Services	$137,284
Feasibility Engineering	$363
Environmental & Regulatory Compliance	$817
Aboriginal Affairs	$80
Procurement & Construction	$739,617
Commercial & Legal	$5,383
Contingency	$5,012
Labrador Transmission Assets Total	$888,556
Muskrat Falls Capital Cost Budget Total	$10,102,328

Contingency Budget (in $ thousands)	November 2019 AFE
Sub-Project:	
Muskrat Falls Generating Facility	$226,400
Labrador-Island Transmission Link	$92,750
Labrador Transmission Assets	$5,012
Total Project	$324,162

II. Project Milestone Schedule

Muskrat Falls Generating Facility	June 2017 Planned Dates
North Spur Works Ready for Diversion	Oct-16
River Diversion Complete	Feb-17
Reservoir Impoundment Complete	Nov-19
Powerhouse Unit 1 Commissioned - Ready for Operation	Dec-19
First Power from Muskrat Falls	Nov-19
Powerhouse Unit 2 Commissioned - Ready for Operation	Mar-20
Powerhouse Unit 3 Commissioned - Ready for Operation	Jun-20
Powerhouse Unit 4 Commissioned - Ready for Operation	Aug-20
Full Power from Muskrat Falls	Aug-20
Commissioning Complete - Commissioning Certificate Issued	Sep-20

Labrador-Island Transmission Link	June 2017 Planned Dates
SOBI Cable Systems Ready	Dec-16
Soldiers Pond Switchyard Ready to Energize	Aug-17
Ready for Power Transmission (LTA)	Dec-17
Muskrat Falls Converter Station Ready to Energize (Pole 1)	Jun-18
HVdc Transmission Line Construction Complete	Dec-17
Soldier's Pond Converter Station Ready to Energize (Pole 1)	Jun-18
1ST Power Transfer (Pole 1)	Jul-18
Soldiers Pond Synchronous Condenser Ready for Operation	Jun-18
Ready for Power Transmission (Low Load Testing Complete Pole 1)	Dec-18
Muskrat Falls and Soldiers Pond Converter Stations - Bipole Dynamic Testing Complete	Mar-19
Commissioning Complete - Commissioning Certificate Issued	Sep-20

Labrador Transmission Assets	June 2017 Planned Dates
HVac Transmission Line Construction Complete	May-17
Churchill Falls Switchyard Ready to Energize	Nov-17
Muskrat Falls Switchyard Ready to Energize	Nov-17
Ready for Power Transmission	Dec-17
Commissioning Complete - Commissioning Certificate Issued	Sep-20

Annex B

Project Expenditures

I. Muskrat Falls Generation

II. Labrador Island Transmission Link

III. Labrador Transmission Assets

Columns in tables may not total due to rounding

I. Muskrat Falls Generation

June 2020 ($000)	Project Budget June 2017 AFE	Cumulative $			Cumulative %		
		Planned	Incurred	Variance	Planned	Incurred	Variance
Description	*A*	*B*	*C*	*C-B*	*D=B/A*	*E=C/A*	*E-D*
NE-LCP Owners Team, Admin and EPCM Services	$655,850	$672,922	$577,715	($95,207)	102.6%	88.1%	-14.5%
Feasibility Engineering	$17,543	$17,543	$16,865	($678)	100.0%	96.1%	-3.9%
Environmental & Regulatory Compliance	$27,125	$27,071	$27,180	$109	99.8%	100.2%	0.4%
Aboriginal Affairs	$16,395	$16,393	$45,183	$28,790	100.0%	275.6%	175.6%
Procurement & Construction	$4,501,984	$4,686,925	$4,492,320	($194,605)	104.1%	99.8%	-4.3%
Commercial & Legal	$54,760	$52,209	$57,038	$4,829	95.3%	104.2%	8.8%
Contingency	$226,400	$0	$0	$0	0.0%	0.0%	0.0%
TOTAL	$5,500,056	$5,473,063	$5,216,300	($256,763)	99.5%	94.8%	-4.7%

June 2020 ($000)	Project Budget June 2017 AFE	Incurred Cumulative Costs June 2020
Description	*A*	*B*
NE-LCP Owners Team, Admin and EPCM Services	$655,850	$577,715
Feasibility Engineering	$17,543	$16,865
Environmental & Regulatory Compliance	$27,125	$27,180
Aboriginal Affairs	$16,395	$45,183
Procurement & Construction	$4,501,984	$4,492,320
Commercial & Legal	$54,760	$57,038
Contingency	$226,400	$0
TOTAL	$5,500,056	$5,216,300

II. Labrador Island Transmission Link

June 2020 ($000)	Project Budget March 2018 AFE	Cumulative $			Cumulative %		
		Plan	Incurred	Variance	Plan	Incurred	Variance
Description	*A*	*B*	*C*	*C-B*	*D=B/A*	*E=C/A*	*E-D*
NE-LCP Owners Team, Admin and EPCM Services	$322,101	$332,101	$363,090	$30,989	103.1%	112.7%	9.6%
Feasibility Engineering	$19,167	$19,167	$18,679	($488)	100.0%	97.5%	-2.5%
Environmental & Regulatory Compliance	$14,726	$14,726	$11,564	($3,162)	100.0%	78.5%	-21.5%
Aboriginal Affairs	$1,003	$1,003	$625	($378)	100.0%	62.3%	-37.7%
Procurement & Construction	$3,233,690	$3,316,440	$3,165,881	($150,559)	102.6%	97.9%	-4.7%
Commercial & Legal	$30,280	$30,280	$24,262	($6,018)	100.0%	80.1%	-19.9%
Contingency	$92,750	$0	$0	$0	0.0%	0.0%	0.0%
TOTAL	$3,713,716	$3,713,716	$3,584,101	($129,615)	100.0%	96.5%	-3.5%

June 2020 ($000)	Project Budget March 2018 AFE	Incurred Costs Cumulative June 2020
Description	*A*	*B*
NE-LCP Owners Team, Admin and EPCM Services	$322,101	$363,090
Feasibility Engineering	$19,167	$18,679
Environmental & Regulatory Compliance	$14,726	$11,564
Aboriginal Affairs	$1,003	$625
Procurement & Construction	$3,233,690	$3,165,881
Commercial & Legal	$30,280	$24,262
Contingency	$92,750	$0
TOTAL	$3,713,716	$3,584,101

III. Labrador Transmission Assets

June 2020 ($000)	Project Budget November 2019 AFE	Cumulative $			Cumulative %		
		Plan	Incurred	Variance	Plan	Incurred	Variance
Description	*A*	*B*	*C*	*C-B*	*D=B/A*	*E=C/A*	*E-D*
NE-LCP Owners Team, Admin and EPCM Services	$137,284	$139,634	$131,553	($8,081)	101.7%	95.8%	-5.9%
Feasibility Engineering	$363	$363	$303	($60)	100.0%	83.5%	-16.5%
Environmental & Regulatory Compliance	$817	$817	$812	($5)	100.0%	99.4%	-0.6%
Aboriginal Affairs	$80	$80	$168	$88	100.0%	210.0%	110.0%
Procurement & Construction	$739,617	$742,279	$726,792	($15,487)	100.4%	98.3%	-2.1%
Commercial & Legal	$5,383	$5,383	$7,078	$1,695	100.0%	131.5%	31.5%
Contingency	$5,012	$0	$0	$0	0.0%	0.0%	0.0%
TOTAL	$888,556	$888,556	$866,706	($21,850)	100.0%	97.5%	-2.5%

June 2020 ($000)	Project Budget November 2019 AFE	Incurred Costs Cumulative June 2020
Description	*A*	*B*
NE-LCP Owners Team, Admin and EPCM Services	$137,284	$131,553
Feasibility Engineering	$363	$303
Environmental & Regulatory Compliance	$817	$812
Aboriginal Affairs	$80	$168
Procurement & Construction	$739,617	$726,792
Commercial & Legal	$5,383	$7,078
Contingency	$5,012	$0
TOTAL	$888,556	$866,706

Annex C

Earned Progress

I. Overall Construction
II. Muskrat Falls Generation
III. Labrador Island Transmission Link
IV. Labrador Transmission Assets

Columns in tables may not total due to rounding

I. Overall Construction

- >99.3% complete

II. Muskrat Falls Generation

- >98.5% complete

III. Labrador Island Transmission Link

- >99.97% complete

IV. Labrador Transmission Assets

- 100% complete

Annex D

Project Milestone Schedule Forecast

I. Muskrat Falls Generation
II. Labrador Island Transmission Link
III. Labrador Transmission Assets

I. Muskrat Falls Generation

June 2020	Planned Date June 2017	June 2020 Actual/Forecast
Project Sanction	17-Dec-12	Complete
North Spur Works Ready for Diversion	31-Oct-16	Complete
River Diversion Complete	15-Feb-17	Complete
Reservoir Impoundment Complete	1-Nov-19	Complete
Powerhouse Unit 1 Commissioned - Ready for Operation	19-Dec-19	30-Sep-20
First Power from Muskrat Falls	2-Nov-19	30-Sep-20
Powerhouse Unit 2 Commissioned - Ready for Operation	3-Mar-20	TBD
Powerhouse Unit 3 Commissioned - Ready for Operation	9-Jun-20	TBD
Powerhouse Unit 4 Commissioned - Ready for Operation	14-Aug-20	TBD
Full Power from Muskrat Falls	14-Aug-20	TBD
Commissioning Complete - Commissioning Certificate Issued	1-Sep-20	Not to be achieved
Date Certain	28-Feb-21	Beyond 28 - August 2021

II. Labrador Island Transmission Link

June 2020	Planned Date June 2017	June 2020 Actual/forecast
Project Sanction	17-Dec-12	Complete
SOBI Cable Systems Ready	9-Dec-16	Complete
Soldiers Pond Switchyard Ready to Energize	31-Aug-17	Complete
Ready for Power Transmission (LTA)	31-Dec-17	Complete
Muskrat Falls Converter Station Ready to Energize (Pole 1)	1-Jun-18	Complete
HVdc Transmission Line Construction Complete	31-Dec-17	Complete
Soldier's Pond Converter Station Ready to Energize (Pole 1)	1-Jun-18	Complete
1ST Power Transfer (Pole 1)	1-Jul-18	Completion of 45 megawatt heat run
Soldiers Pond Synchronous Condenser Ready for Operation	1-Jun-18	TBD
Ready for Power Transmission (Low Load Testing Complete Pole 1)	1-Dec-18	Complete
Muskrat Falls and Soldiers Pond Converter Stations - Bipole Dynamic Testing Complete	31-Mar-19	TBD
Commissioning Complete - Commissioning Certificate Issued	1-Sep-20	Not to be achieved
Date Certain	28-Feb-21	Beyond 28 - August 2021

III. Labrador Transmission Assets

June 2020	June 2017 Budget Planned Date	June 2020 Actual/Forecast
Project Sanction	17-Dec-12	Complete
HVac Transmission Line Construction Complete	31-May-17	Complete: Turnover of HVac TL and all subsystems complete
Churchill Falls Switchyard Ready to Energize	30-Nov-17	Complete
Muskrat Falls Switchyard Ready to Energize	30-Nov-17	Complete
Ready for Power Transmission	31-Dec-17	Complete
Commissioning Complete - Commissioning Certificate Issued	1-Sep-20	Not to be achieved
Date Certain	28-Feb-21	Beyond 28 - August 2021

End of Report